

ADSW 2023 REPORT

United on Climate Action towards COP28



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MASDAR 

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Foreword

By providing a global platform for all who have a stake in the future of our planet, the discussions, agreements, and takeaways from Abu Dhabi Sustainability Week have never been more urgent and important than this year. Now in its 15th year, ADSW has grown into a leading forum to drive the world's clean energy transition, and once again, provided a resounding show of commitment to climate action. ADSW 2023 reaffirmed that we must urgently accelerate every possible action to get the world back on track by 2030. What is at stake is nothing less than the future of our people and planet. We all have a responsibility to come together and act now to protect not only its rich biodiversity, but also the eight billion people that call Earth their home.

The UAE has the honor of hosting this year's United Nations Climate Change Conference (COP28). As President-Designate of COP28, I will work hard to ensure that this will be a COP of meaningful and equitable action, and a COP keeping the ambition of 1.5C. To succeed, we must balance decarbonization and clean energy transition on the one hand with energy security and protecting livelihoods on the other.

We all know that the road to a sustainable future is full of challenges, and yet I am certain that we still have enough time to work together to accelerate every possible action to get the world back on track by 2030 – provided we act now. We need everyone, in every industry, in every country and at every level of society to turn their words into action. Whether you are in government discussing regulations that incentivize change, whether you work in high emitting industries struggling to decarbonize, or whether you are an individual wondering whether your contributions matter – for all of us: the time of talking is over. We must move from words to action, turn ambitions into reality and shift from proposing solutions, to implementing them.

ADSW has always been about more than 'what's possible'; we have always pushed the boundaries of what is do-able. That is the reason why the UAE is already a leader in climate action and Masdar has become a showcase for turning climate ambition into climate action. As a nation, the UAE can be proud of the transformation achieved already. We have demonstrated that there is a clear scientific and a compelling economic case for climate action.

And yet, there is still a long way to go – in the UAE, and around the world. To bring about change, our world must cooperate and collaborate. At this year's ADSW, many international clean energy projects were agreed and signed. We have seen the first wave of investments under the Partnership for Accelerating Clean Energy (PACE) between the UAE and the United States, in which US\$20 billion will be allocated to fund 15 GW of clean energy projects in the US before 2035. Masdar also agreed 5 GW worth of renewable energy projects in three African nations, as part of the Etihad 7 UAE initiative. In addition, several agreements were signed to expand the reach and scale of renewables across Europe.

We need to kickstart an inclusive process of cooperation, collaboration, and action at every level. We need to bring together governments, industries, and civil society, North and South, rich, and poor, old, and young alike.



**H.E. Dr. Sultan Ahmed
Al Jaber**

UAE Minister of Industry and Advanced
Technology, Chairman of Masdar and
COP28 President-Designate

That's why – at least in the long term – two initiatives at ADSW may turn out to have great impact: the Youth 4 Sustainability Hub and the WiSER Forum for Women in Sustainability, Environment & Renewable Energy. Climate action makes our world safe – by people for people. It is today's youth who will experience the worst of climate change. And it is today's women who are already disproportionately affected by climate change. As ADSW has shown, there can be no climate solution without having women and young people among the key decision makers and actors in the fight against climate change. Without a doubt, building on the ADSW experience, this will be another action point for COP28.



Introduction

Human-induced climate change has taken a substantial toll on the world in recent years, increasing the frequency, intensity, and magnitude of natural disasters. The surge in extreme weather events is a direct consequence of increasing greenhouse gas emissions, which continue to rise despite numerous climate-change pledges. As a result, 2015 to 2021 were the warmest years on record, according to a multi-agency report coordinated by the World Meteorological Organization¹.

At the same time, population growth is putting greater pressure on natural resources. In November 2022, the world's population crossed the 8 billion mark². By 2030, when most of the UN's Sustainable Development Goals (SDGs) are targeted to be achieved, it is expected to reach almost 8.5 billion.

While the road to a sustainable future is fraught with challenges, there is still a window of opportunity for action to limit warming to 1.5 degrees Celsius and mitigate climate change's impact. Under the theme 'United on Climate Action Towards COP28', Abu Dhabi Sustainability Week (ADSW) 2023, the global initiative championed by the UAE and its clean energy powerhouse Masdar, fueled such action by convening heads of state, policymakers, industry leaders, investors, youth, and entrepreneurs for an intensive series of impactful dialogues.

The fifteenth edition of the one-week gathering hosted the ADSW Summit, the IRENA Assembly, Atlantic Council Global Energy Forum, Zayed Sustainability Prize Awards Ceremony, Green Hydrogen Summit, World Future Energy Summit (WFES), Innovate, Youth 4 Sustainability Hub (Y4S), WiSER Forum, the Arctic Circle Abu Dhabi Forum, the Foodtech Challenge, and the Abu Dhabi Sustainable Finance Forum. This report summarizes the findings from the ADSW events, the full list of which can be found in the Appendix.

The world has undoubtedly made progress toward climate change goals since the adoption of the Paris Agreement in 2015. Both developed and developing countries have set ambitious plans, and many governments have strengthened their Nationally Determined Contributions. However, enormous opportunities have yet to be unleashed through innovation of technologies, and substantial amounts of emissions could be offset while benefiting communities and nature through the scale-up of carbon markets.



8.5bn

is the estimated
size of the world's
population by 2030



Given the scale and scope of the global sustainability goals, many of the obstacles impeding the transformation require a collaborative response. For example, countries need to balance their national priorities with short- and long-term global climate goals, which requires collaboration between local and international communities. Corporates need to reduce their carbon footprint without compromising viability, a process that requires collaboration between the public and private sectors as well as transition finance and commercially viable technology. Fossil-fuel phase-outs need to be carried out without disrupting the livelihoods of communities, which again necessitates cooperation between government and citizens, and requires international support in developing countries.


The general consensus at this year's ADSW was that solving such immense challenges can only be done through greater cross-sector collaboration and by harnessing the power of public-private partnerships. No actor can achieve change alone; hence collaboration is needed to achieve speed and scale, which is why conversations must continue with the goal of propelling action.

Many of this year's ADSW events also focused on the priorities for sustainable development ahead of the 28th session of the Conference of the Parties (COP28) to the United Nations Framework Convention on Climate Change (UNFCCC), to be held in the UAE from 30 November to 12 December 2023.

Building on the progress made at Egypt's COP27 as well as previous COPs, the UAE's COP28 is set to accelerate 2030 trajectories through game-changing partnerships, solutions, and outcomes. As one of the countries at the heart of climate impact, undergoing a major energy transition, the UAE intends to make COP28 a model for all future COPs, whilst showcasing the Emirati values of cooperation, tolerance, and dialogue.

COP28 will also be significant because it marks the culmination of the inaugural Global Stocktake, a comprehensive assessment of the progress against the Paris Agreement goals. The two-year process, which started in 2021 at COP26 in Glasgow, will evaluate the world's advancement towards climate goals and inform countries on how they need to update and potentially ramp up planned actions.

1. World Meteorological Organization. [United in science: We are heading in the wrong direction](#). Press release. 13 September 2022.
2. United Nations Population Division. [World Population Prospects 2022](#). November 2022.

An underwater photograph showing a vibrant coral reef. Sunlight rays stream down from the surface, illuminating the scene. The water is clear, and various types of coral are visible, including branching and table corals. Small fish and particles are scattered throughout the water column.

**Tackling climate change
through concerted action**



“COP28 is quite simply one of the greatest responsibilities our country has ever undertaken, and our collective ambition and commitment to its success could not be higher.”

**H.E. Ambassador
Majid Al Suwaidi**

Director General and Special
Representative of COP28



Despite global awareness and efforts to tackle climate change, GHG emissions continue to rise. The past seven years, 2015 to 2021, were the warmest on record, according to a multi-agency report coordinated by the World Meteorological Organization. Additionally, levels of CO2 continued to increase in 2021 and 2022, the report said.

“We are way off track. We need to go much further, and much faster. We’re playing catch-up in our efforts to keep [the] 1.5 [degrees-Celsius pathway] alive. We need to reverse emissions while moving economies forward, enabling an inclusive and a just transition that leaves no one behind,” H.E. Dr. Sultan Ahmed Al Jaber, UAE Minister of Industry and Advanced Technology, Chairman of Masdar and COP28 President-Designate, told delegates at the ADSW opening ceremony.

“That’s why we’re determined to make COP28 a COP for all and a COP of action; a COP where the global North and global South really communicate and listen to each other; a COP where we move from goals to getting it done across mitigation, adaptation, and of course, loss and damage; and a COP where we deliver a new transformative deal on climate finance,” H.E. Dr. Al Jaber said.

As the first country in the Middle East and North Africa to ratify the Paris Agreement and commit to net zero carbon emissions by 2050, the UAE has long been committed to the energy transition. According to the Green Fuel Index report, published by Australia-

based aggregator Compare the Market, the UAE recorded the largest increase in renewable energy capacity worldwide over the past decade – from 13 megawatts (MW) in 2011 to 2,450 MW in 2020. This is a growth of almost 20,000 percent³.

H.E. Ambassador Majid Al Suwaidi, Director General and Special Representative of COP28, stated at the ADSW Summit: "Every one of us can see the terrible costs and consequences of climate change. But what needs to be just as widely acknowledged are the tremendous benefits and opportunities of climate action."

H.E. Eng. Awaidha Murshed Al Marar, Chairman of the Abu Dhabi Department of Energy, added in his welcome remarks: "Abu Dhabi has set an ambitious sustainability agenda over the past 15 years and has taken important measures in this regard. The emirate now accounts for nearly 70 percent of all renewable energy projects in the region, as well as being the first in the region to use carbon capture technology on an industrial scale, and the first to use peaceful nuclear energy. Up to 25 percent of the UAE's electricity needs are expected to be produced from nuclear energy, reducing the emission of up to 21 million tons of carbon emissions each year."

John Kerry, US Special Envoy for Climate, told delegates at the IRENA Assembly: "There's nothing in the current activities of countries all around the world that indicates that we are prepared to do what we need to do in order to meet the 1.5°C [goal]."

Rising to the challenge

Simon Stiell, Executive Secretary at the UNFCCC, urged the audience to attempt a new challenge before participating in COP28. "Before you put on your negotiating hats, whether that be for a government, a company or institution, spend some time being philosophical. What does the world really need? How can we present what it needs in a practical and usable form? The Global Stocktake won't deliver simply because it's a date on the calendar, or because it's a technical obligation, but because we choose to rise to the challenge of the great opportunity for accelerated action," Stiell told delegates.

For Dr. Angela Wilkinson, Secretary General and CEO of the World Energy Council, COPs are not meant to deliver a definitive solution; rather, they are designed to encourage gradual change. "It's a process, not just an event. There's stuff that happens before you get there, and there's stuff that happens after you come away. What everybody on this panel has been saying is, make it about impact. Let's have an emissions stocktake; let's have a technology stocktake, but also, let's make it about impact," Wilkinson told delegates.

"What I would like to see at COP, and what we will support, is how do we give the world a confidence boost that everybody can do this? How do we see how place-based transitions are really working from Alaska to Aberdeen, from Singapore to Seattle, from Beijing to Botswana?" said Wilkinson.

One of the problems with climate negotiations to date has been that the business conversation takes place separately from the government conversation, according to Ann Mettler, Vice President for Europe at Breakthrough Energy, a group of organizations founded by philanthropist Bill Gates with the goal of accelerating innovation in sustainable energy.



"Not enough money is being put on the table to solve this problem [climate crisis]. We're either not trying to do it or we're trying to do it on the cheap, and the result is that we're not doing it. We've never had the full measure of the US\$100 billion that was promised in Paris."

John Kerry

Special Presidential Envoy
for Climate, US Department
of State

70%

of renewable energy
projects in the Middle
East are in Abu Dhabi



"The energy transition is not just a priority in these defining times, but a responsibility for countries, industries, and communities. India continues to advance visible action towards its strong commitment."

Raj Kumar Singh

India's Cabinet Minister for Power and New and Renewable Energy and President-Designate of the 13th IRENA Assembly



"There's a unique opportunity to change that here. For example, with the UAE as the host, can we bring together a good number of national oil companies to commit to an economy-wide transition and decarbonization of their energy system? If we can get that collaboration going and create meeting points during COP to make that happen, then I think you'll make real progress," Mettler told delegates.

The UAE has already set the wheels in motion for COP28. For example, in January 2023, the UAE's presidency of COP28, and the UN Environment Program-led Cool Coalition, launched the Global Cooling Pledge and a "Cool COP Menu of Actions" that will feature prominently at COP28⁴. The initiative will tackle the alarming findings by Sustainable Energy for All (SEforALL), which show that almost 2.5 billion people do not have access to climate-friendly cooling solutions, and more than one billion are at high risk from extreme heat due to a lack of cooling access.

The UAE's COP28 will build on the negotiations and achievements made at Egypt's COP27 as well as previous COPs. With support and engagement from the youth, and with the anticipated attendance of nearly 70,000 participants, COP28 is set to drive the shift from pledges to concrete action. As the countdown begins, the whole world and particularly the Middle East, aspires to resume the momentum created at last year's summit.

COP27 was the largest summit in COP history, attracting more than 46,000 participants. But what made the event impactful was the fact that multilateralism achieved a decisive victory. For example, COP27 reached the historic decision to establish a loss and damage fund for nations most vulnerable to the climate crisis. Additionally, at COP27, parties agreed on a new five-year work program to promote climate technology solutions in developing countries. Moreover, for the first time at a UNFCCC conference, young people had a dedicated space alongside world leaders and ministers.

H.E. Sameh Shoukry, Egypt's Minister of Foreign Affairs and COP27 president, stated: "We're proud to have been able to deliver on a long-awaited 40 years in the making on loss and damage. We look

forward to the finalization of the structure and the governance and architecture of the fund and hopefully that it will be endorsed, but more importantly, financed in COP 28. I'm confident that COP28 will present its credentials as an important COP, where several crucial mandates and deliverables will be agreed and taken forward. The journey from Sharm el-Sheikh to Dubai is very instrumental to the rich and ambitious outcomes which we all look forward to at COP28."

Besides loss and damage, climate-adaptation remains a problem for the developing world. The process, which could require everything from building sea walls to creating drought-resistant crops, is estimated to cost developing countries anywhere from US\$160 billion to US\$340 billion annually by 2030. That number could swell to US\$565 billion by 2050 if climate change intensifies, according to the UNEP's 2022 Adaptation Gap report⁵.

Developing countries have other problems to deal with. Today, 54 of the world's poorest developing countries are on the brink of bankruptcy due to debt problems⁶. In 2021, the external debt owed by developing countries reached US\$11.1 trillion, the highest level on record⁷. Such heavily indebted nations need more climate finance in the form of grants, instead of loans.

Developing nations set ambitious goals

Despite the burden of foreign debt, many developing countries have set ambitious sustainability goals. For instance, Ethiopia, the second most populous nation in Africa after Nigeria, has laid out a 10-year development plan that will facilitate the country's shift from an agriculture-dependent economy to a more private-sector driven, climate-resilient industrial economy.

Elaborating on this plan, H.E. Abiy Ahmed, Prime Minister of Ethiopia, said: "In 2019, Ethiopia launched a practical action through the Green Legacy Initiative that within four years mobilized over 25 million Ethiopians across the nation to plant 25 billion seedlings. This is equivalent to 250 seedlings per Ethiopian, and the impact could be equated to removing 64 million gasoline-powered cars from roads for a whole year. We are committed."

"The Green Legacy Initiative is our bold action, which has created national awareness on climate change, enabled the creation of green jobs, and is making a positive impact on our surrounding environment. Today, Ethiopia's Green Legacy Initiative is the most extensive afforestation and reforestation program next to the Amazon," Prime Minister Ahmed told delegates at the ADSW Summit.

Speaking about the challenges in his country, H.E. Hakainde Hichilema, President of Zambia, said: "For us, one of the key issues is to ensure that we can remove the bureaucracy, the rigidities around what slows down investment into the clean energy sector, and that we're working on very, very quickly. Obviously, that should allow the private sector and bilateral and multilateral arrangements to come into place to exploit the resource endowment that is there and in an area that we cannot actually make a choice about. We have to have clean energy."

Meanwhile, food systems will have a central stage at COP 28, which will build on the momentum achieved at previous COPs around food



"There should be a very clear message to the oil and gas companies that this is their last best chance to play an active role in the COP processes. This is the chance for the industry to show that it can bring solutions, and it can help to accelerate change."

Rt. Hon. Charles Hendry

CBE PC Professor, University of Edinburgh, and former UK Minister of State for Energy

2.5bn

people have no access to climate-friendly cooling systems



“The task ahead is massive but so is the opportunity. The road to net zero represents the biggest market transformation with the greatest economic promise since the first industrial revolution. A low-carbon pathway to a high-growth destination with inclusive growth for all.”

H.E. Dr. Sultan Ahmed Al Jaber

UAE Minister of Industry and Advanced Technology,
Chairman of Masdar and COP28
President-Designate

and agriculture, according to H.E. Mariam Almheiri, UAE Minister of Climate Change and Environment. For example, COP27 saw the launch of the Food and Agriculture for Sustainable Transformation (FAST) initiative, which aims to unlock climate finance to decarbonize and increase the resilience of food and agriculture sectors, especially in the world's most vulnerable communities.

Transforming food systems

COP27 also introduced the Initiative on Climate Action and Nutrition (I-CAN), which will work to leverage the heightened global attention on food systems transformation and deliver technical support from governments, UN agencies, NGOs, and the private sector. Whereas at COP26, the Agriculture Breakthrough was launched by a coalition of 45 world leaders, whose governments collectively represent over 70 percent of global GDP. The initiative aims to make climate-resilient, sustainable agriculture the most attractive and widely adopted option for farmers everywhere by 2030.

“What was really good was that the UAE had a two-year planning period. Last year, it was all about setting up the foundation and the COP28 team, and ensuring we know the location of COP28. This year, it's all about the consultations we have to have with the different stakeholders. We're coming slowly but surely together with a food systems program for COP28,” Minister Almheiri told delegates.

Food system emissions were estimated at 18 billion tons of carbon dioxide equivalent in 2015, or 34 percent, according to the UN Food and Agriculture Organization⁸. Yet less than 12 percent of national policies worldwide consider climate, biodiversity and nutrition; only 32 percent of National Action Plans include adaptation actions related to food safety and nutrition; and few Nationally Determined Contributions (NDCs) commit to actions that aim to tackle climate and nutrition⁹, according to a report by COP27.

Support for locally grown produce

The UAE is the only country that has announced the integration of food systems transformation into their Nationally Determined Contribution; this needs to happen across countries, according to Dr. Gunhild Stordalen, Founder and Executive Chair at EAT Foundation, a Norway-based non-profit dedicated to transforming our global food system.

“COP28 could be the Paris moment for food. We need to see countries, companies, cities, and the financial sector step forward with hard commitments based on the national pathways developed during the UN Food System Summit. We need measurable and traceable commitments, and we need transparency and accountability,” Stordalen told delegates.

In 2022, the UAE, which imports 90 percent of its food, directed government entities such as the armed forces and hospital authorities to buy locally grown produce to support local farmers and agritech efforts in the desert country. Minister Almheiri revealed that national companies pledged to procure 50 percent of food items locally in 2023. This will increase to 70 percent in 2024, and 100 percent by 2030.

In its push to strengthen food security and create new opportunities for the local agriculture sector, the UAE has also been supporting

the cultivation of crops that can thrive in the desert. An example is salicornia, an asparagus-like plant that grows in salty waters, and which is already being used as a salt replacement in burger patties and crackers by UAE food manufacturers.

In Egypt, KarmSolar, a developer of solar-energy solutions for off-grid and on-grid applications with a portfolio of 42 MW of renewable energy plants, is looking to maximize the use of renewables in agricultural production. While there is plenty of information on how to use fossil-fuel sources to power agriculture, there is little data on the correlation between the use of solar or wind energy with different crops, according to Ahmed Zahran, Co-Founder and CEO of KarmSolar.

"Right now, we're developing a solar profile for each and every crop, and creating the same type of profile for water sources. When you're able to correlate your crop with the renewable energy resource that you're using, you can get to certain efficiencies that allow you to make the best use out of renewable energy," Zahran told delegates.

Moving towards a sustainable future also requires a significant reduction in food waste and loss. About a third of all food produced for human consumption gets destroyed before it gets harvested, according to Dr. Andrey Zarur, CEO of US-based GreenLight Biosciences, a synthetic biotechnology company that is developing an RNA platform for agriculture and human health.

"This food is destroyed by pests, by insects, fungi, and weeds, and the solutions that we have available to counteract those pests are basically 50-year-old chemistries or fossil fuel-derived pesticides. The reason we keep losing 30 percent to 40 percent of our food is because most of the pests that we care about have actually developed resistance against those chemical pesticides," Dr. Zarur told delegates.

To solve this problem, GreenLight is developing a sustainable alternative to traditional pesticides — an RNA-based product that targets harmful pests while protecting beneficial insects and preserving the environment. "The goal is to replace systematically chemicals in our food. Chemicals should not have a role in growing



"Nature can provide up to 30 percent of carbon dioxide mitigations by 2030, and I'd like to expand the narrative. Nature is not only an asset for adaptation but it's an asset for mitigation. It's a 'technology' that works, so it's the least expensive. It's at scale and it's where the communities are. So, for me, I will certainly leverage my network within the conservation to bring the climate change and biodiversity agenda together where they belong."

H.E. Razan Al Mubarak

President of the International Union for Conservation of Nature, and UN Climate Change High-Level Champion for COP28





food. We should be able to control all these biological threats to our food security using biological solutions, and that's what GreenLight is bringing to the market," said Dr. Zarur.

He added that by the end of this decade, chemical pesticides will be a thing of the past. "We are destroying the soil on which we rely on to grow food and we are absolutely putting in jeopardy our health and the health of our children. We need to come up with biological solutions that are safe, effective, and affordable to farmers," said Dr. Zarur. The role of governments, he added, was to pass regulations that allow for safe biological controls to be deployed rapidly and to incentivize the development of advanced technologies that protect our food.

In an effort to identify and support the world's most innovative food-security solutions, the UAE Ministry of Climate Change and Environment and Tamkeen launched the FoodTech Challenge in 2019. The inaugural competition had a prize pool of US\$1 million and received 437 submissions from food and agritech startups across 68 countries, with four winners announced in November 2020.

ADSW 2023 saw the announcement of four winners in the second edition of the global FoodTech Challenge, which sought to find the next wave of sustainable technology innovations on the cusp of transforming traditional agriculture practices. They were selected from a pool of 12 finalists chosen from 667 submissions from around the world.

When it comes to the sustainable management of water, Farid Al Awlaqi, Executive Director of Generation at TAQA and Board Member at Masdar highlighted that the Middle East region receives only 2 percent of the world's rainfall despite being home to 10 percent of the world's population. "We're very scarce in water, particularly in the GCC, where 81 percent of the water we have comes from desalination. The main desalination technology in the Middle East is multi-stage flash distillation (MSF), which is coupled with our power generation fleet. This consumes a lot of energy," Al Awlaqi told delegates.

"Almost 25 percent of the energy we produce goes specifically to desalination, so the nexus between energy and water in the Middle East is very strong. We're having to find ways to do what

81%

of the water in the GCC comes from desalination

we do today more efficiently whilst reducing our carbon footprint. We're shifting towards new technologies, such as reverse osmosis (RO), a technology that's five to six times more efficient than the technologies we have today. We're going to be decoupling water from energy production and moving towards RO, which is independent of our current power generation fleet," he added.

Low-carbon RO desalination plants enable more than 85 percent reduction in carbon emissions associated with water production, according to French utility company ENGIE. Given the enormous potential of this technology, a consortium of TAQA and ENGIE is currently developing the world's largest low-carbon RO desalination plant, Al Taweelah. The plant is partially powered by solar energy, which is expected to meet 30 percent of the plant's electricity demand in the first eight years, with a target of increasing solar energy's share to 55 percent by the end of the first quarter-life of the project. It will serve about 350,000 homes when fully operational, according to Al Awlaqi.

Shannon McCarthy, Secretary General at the International Desalination Association, noted that desalination was the only way to produce drinking water in many parts of the world, including the Middle East and North Africa, California, and all island countries. "That's what we're seeing across the globe. As we move toward the UN 2023 Water Conference in March, we're advocating for the inclusion of unconventional water-resource solutions such as desalination and water reuse – they must become a bigger part of national planning for integrated water management," she said.




3. Norton, Hannah. [The Green Fuel Index 2022](#). comparethemarket, based on statistics compiled by the International Renewable Energy Agency. 27 April 2022.
4. United Nations Environment Program. [Partners announce new ambition on sustainable cooling for COP28](#). Press release. 16 January 2023.
5. United Nations Environment Program. [COP27 ends with announcement of historic loss and damage fund](#). Press release. 22 November 2022.
6. United Nations Development Program. [50 percent of world's poorest need debt relief now to avert major systemic development crisis, warns UN Development Program](#). Press release. 11 October 2022.
7. SDG Pulse 2022 / UNCTAD. [Developing country external debt: A cascade of crises means more countries face debt distress](#).
8. Food and Agriculture Organization of the United Nations. [Food systems account for more than one third of global greenhouse gas emissions](#). Press release. 9 March 2021.
9. COP27. [Initiative on Climate Action and Nutrition](#). November 2022.

Tackling climate change through concerted action

Key outcomes

- 1 The UAE aims to make COP28 an inclusive COP of action, where the global North and South communicate on delivering a new transformative deal on climate finance.
- 2 One of the problems with climate negotiations has been that the business conversation takes place separately from the government conversation. The UAE COP aims to inspire greater collaboration and create more meeting points between the two.
- 3 Despite the burden of foreign debt, many developing countries are working towards sustainability goals. Ethiopia has laid out a 10-year development plan to shift from an agriculture-dependent economy to a more private-sector-driven, climate-resilient industrial economy, while Zambia is working on removing the bureaucracy that's slowing down investment into the clean energy sector.
- 4 Food systems will have a central stage at COP28 that will build on the momentum achieved at previous COPs around food and agriculture.
- 5 Unconventional water-resources solutions such as desalination and water reuse need to become a bigger part of national planning for integrated water management.

The image is a full-page background featuring a composite of renewable energy elements. In the foreground, a large array of dark blue solar panels with silver grid lines is visible, arranged in rows that recede into the distance. In the background, three white wind turbines with three blades each are silhouetted against a vibrant orange and yellow sunset sky. The sun is a bright, glowing orb positioned between two of the turbines. A line of dark evergreen trees is visible on the horizon behind the solar panels.

**Building the energy
systems of tomorrow**



“Coal is the biggest emitter by far. I see a lot of attack on oil and gas companies and demonizing of oil and gas companies, but I don’t see a similar attack on the biggest polluter on the planet.”

H.E. Saad Sherida Al-Kaabi

Qatar Minister of State for Energy Affairs and President and CEO of QatarEnergy



Successful climate action depends largely on the ability of all industrial sectors, and in particular hard-to-abate industries – the largest carbon emitters – to transition to new energy sources by the second half of this century.

In the last two years, the global energy crisis has boosted the economic case for the energy transition, making investment in renewables even more attractive, according to the International Energy Agency (IEA). As a result of this trend, the IEA predicts that global renewable capacity will increase by almost 2,400 gigawatts – or about 75 percent – between 2022 and 2027.

“As COP28 President, the UAE is calling on the whole world to remember that not only is the scientific case for climate action clear, but so too is the economic case. And the UAE can testify to this from our own direct experience,” H.E. Ambassador Majid Al Suwaidi, Director General and Special Representative of COP28, told delegates.

“We have spent the last two decades diversifying our economy and turning our nation into a powerhouse of clean energy. Where once the prosperity of our nation depended on oil and gas, today, over 70 percent of our national GDP comes from other sectors and revenues. We have seen the jobs, opportunities, and benefits our energy transition is bringing to our citizens and residents alike. It is now one of the UAE’s most profoundly held convictions that climate action is not only the world’s greatest responsibility; it’s also our greatest opportunity. Our mission at COP28 is to unlock that opportunity in every country, on every continent.”

Supercharging the energy transition

Initiatives such as the Energy Transition Accelerator Financing (ETAF) Platform – launched by the UAE and the Abu Dhabi-based International Renewable Energy Agency (IRENA) in 2021 – are expected to support the energy transition in places that need it the most. The global climate-finance facility was created to supercharge the renewable energy transition in developing countries, by securing a minimum of US\$1 billion in funding to finance 1.5 GW of renewable energy projects by 2030.

In 2022, the Abu Dhabi Fund for Development committed US\$400 million in funding toward ETAF’s goal, while Abu Dhabi-based clean

energy company Masdar committed to an investment of up to US\$200 million. "All of that money will go towards countries that need it, financing projects that require money which they're not able to get," Mohamed Al Ramahi, Chief Executive Officer of Masdar. He noted that Masdar was currently active in over 40 countries, with over 20 GW of renewable energy projects, and that it planned to increase that capacity to at least 100 GW by 2030.

However, government financing can only go so far, said John Kerry, Special Presidential Envoy for Climate, US Department of State. At the IRENA Assembly, Kerry told delegates: "No government in the world has enough money to do what we need to do. We're talking about trillions. Who has the trillions? The private sector has the trillions. So, what we need to be doing globally is exciting that private sector money to begin to move to bankable deals that bring development to parts of the world that have been left out. But also enlist everybody in the effort to be able to make the transition to the kind of a world and economy that we need."

Kadri Simson, Commissioner for Energy at the European Commission, told the IRENA Assembly: "Developing an energy system based on renewable energy has never been more urgent or necessary than it is today. In Europe we have annual investment in 25 gigawatts of wind and 40 gigawatts of solar until 2025 and 43 gigawatts of wind and 53 gigawatts of solar by 2030 and this is the pace you need to end the dependence on fossil fuels and to reach net zero by mid-century."

In almost every part of the world, energy security concerns arising from the global crisis have pushed countries to accelerate decarbonization efforts. France, for example, which like many other European countries, has suffered from its dependency on fossil fuels, is developing new facilities for low-carbon electricity production, both nuclear and renewables.

Addressing delegates, H.E. Agnes Pannier-Runacher, France's Minister for Energy Transition, elaborated: "We have decided as chairman of the EU for a semester of 2022 to push the agenda for 'Fit for 55'. We're committed to reducing our CO2 emissions by 55 percent by 2030 with a lot of legislation for all sectors, including transportation, buildings, and agriculture. We know we may have



US\$1 bn

is needed by the
developing world
to fund 1.5GW of
renewables by 2030



“Renewables are important, but renewables alone will not satisfy the energy needs of the world. The world needs to grow, so it needs more energy. That’s why we need to produce all sources of energy in a more responsible and sustainable way.”

H.E. Osama Mobarez

Secretary General, East
Mediterranean Gas Forum



social unrest sometimes and issues of acceptability, but we believe this is the right plan if we want to be ready by 2030 and achieve net zero by 2050.”

The picture is very different in the Maldives, one of the lowest-lying island nations in the world. While the island state contributes only 0.0035 percent of global emissions, it has committed to net zero emissions by 2030. Maldives’ ambitions are driven by both the environmental and business case as it spends 10 percent of its GDP on oil imports.

H.E. Khadheeja Naseem, Maldives’ Minister of State for Environment, Climate Change, and Technology, said the country’s Climate Emergency Act, passed two years ago, mandated the use of renewable energy across all sectors and in all government buildings.

“The Maldives is 1,180 islands, roughly 200 resorts, and 200 inhabited islands. So, there are many, many grids and lots of inefficiencies. We’re trying to address that. We’re also preparing outer islands for sustainable energy development by transforming the energy grids in Maldives into a hybrid renewable energy system, because storage is expensive, and we’re working on that. But while we wait for that, we’re working on our grid systems,” Minister Naseem told delegates.

To speed up the transition, the Maldives waived import duties on renewable energy equipment and plans to introduce conducive regulations such as feed-in-tariffs and net metering. The country is also developing regulatory frameworks to enable the adoption of floating solar systems at tourist facilities.

In Africa, the energy transition to the average African is about having energy access, according to Damilola Ogunbiyi, CEO and Special Representative of the UN Secretary-General for Sustainable Energy for All and Co-Chair of UN-Energy.

“Energy access, climate resilience, future jobs, and clean tech are all part of energy transition. But the fundamental question is, what do we do from now to 2050 or 2060 to get to a point of net zero. In my country, Nigeria, we did an Energy Transition Plan, which showed that

from now to 2060, for Nigeria to get to a point of net-zero energy, uplift 100 million people out of poverty, and grow a proper industrial base, it's going to cost US\$1.9 trillion dollars," Ogunbiyi said at the ADSW Y4S Hub.

Evidently, the approach to the energy transition will vary from country to country. However, what is consistent across all regions is the need to deploy clean energy at an incredible speed. This poses a challenge, according to Dr. Christian Bruch, CEO of Siemens Energy. "If you build out renewables and produce a lot of renewable electricity, you'll need to strengthen electrical grids. In a lot of grid infrastructures, particularly in Africa and parts of the Middle East, you lose between 20 percent and 50 percent of the electricity produced because of bad electrical grid infrastructure," Bruch told delegates.

In this context, many countries will need to invest in strengthening their electrical grids as they deploy more renewables. But because this process takes time, efforts should simultaneously be made to drive energy efficiency. This is the world's only short-term means of bringing down energy consumption, according to Dr. Bruch.

Existing infrastructure is also important, Dr. Bruch noted. "You don't rebuild energy systems by just scrapping everything you have and putting in completely new systems. We need to think about how to avoid stranded assets and reuse some of the existing assets. You can do a lot by decarbonizing and driving efficiency of existing conventional systems, such as by getting better gas-fired systems. If we do all these things, we need to recognize that the reduction in the amount of minerals and materials in projects is enormous, and without the proper strategy, it won't work. We need better business models driving the energy transition; profit drives the energy transition. If we want to speed up renewable deployment, then we need to reframe the business models."

Over the next two decades, power consumption is projected to triple as electrification and living standards grow, according to McKinsey's Global Energy Perspective 2022 report¹⁰. In light of these projections, the world needs an expanding energy mix that uses all available technologies.



"There's no way in our climate promises where you can go ahead and hit net zero and leave a billion people in energy poverty. It just doesn't happen that way."

Damilola Ogunbiyi

Special Representative of the UN Secretary-General and CEO of Sustainable Energy for All

81%

of the water in the
GCC comes from
desalination



While clean integrated power solutions are an integral part of the future energy system, they are going to take time, Lorenzo Simonelli, Chairman and CEO of energy technology company Baker Hughes said. "Solutions that allow zero-emissions power generation are going to be real, but they're likely to take a few decades. Fundamentally, we need to have a pragmatic approach, and we also need to have a consensus that we've got to build upon the energy mix and not vilify different fuels. All fuels are going to be necessary because energy efficiency will get us only part of the way there," Simonelli told delegates.

The time factor supports a realistic transition

Adebayo Ogunlesi, Chairman and Chief Executive Officer at Global Infrastructure Partners shared a similar opinion. Addressing delegates, he said that the energy transition was a massive undertaking, one that requires a complete restructuring of the global energy system and decarbonization across all sectors, some of which are difficult to decarbonize.

"It requires trillions of dollars in investment. The last time we did an energy transition it took well over a hundred years, when we moved towards fossil fuels. If you take 2050 as the [target] year, we're trying to do the same thing in 30 years, with a much more complicated and sophisticated global economy."

Phasing out fossil fuels in such a short period of time is unrealistic, he noted. "Everybody knows renewable energy is intermittent, the sun doesn't shine at night, sometimes the wind doesn't blow. You need a fossil-fuel based system to provide stability of supply; you need massive investment in battery storage and in revamping grids. What we should be focused on is going for lower carbon fossil fuels. So, eliminate coal, move to low-carbon gas."

According to Ogunlesi, the energy transition requires is a comprehensive plan where massive investments continue to be made in renewable energy, and in research and development of new technologies. Both requires vast amounts of government incentives and support.

“When you do all those things, you start to make a dent. It’s hard to think of the US as being a market leader in this, but the country has done something. It’s called the Inflation Reduction Act and it has nothing to do with inflation. It’s the most significant piece of climate legislation ever enacted by the US – almost US\$400 billion of subsidies for green energy, hydrogen, biofuels, carbon capture, sequestration. To me that is the path forward. Other countries should spend time focusing on doing the same sort of thing to move things forward.”

Hard-to-abate sectors were also in the spotlight at ADSW. IRENA Director-General Francesco La Camera told delegates: “The successful decarbonization of the shipping sector is a story of massive deployment of renewable electricity and electrolyzer technology. The decarbonization of this sector needs to have a collaborative approach involving the global shipping industry, governments, and international organizations. We need to build new pillars of infrastructure including a network of ports for green hydrogen trade, connecting new points of supply and demand.”



10. McKinsey & Company. [Global Energy Perspective 2022](#). April 2022.

Building the energy systems of tomorrow

Key outcomes

- 1 Energy security concerns arising from the global crisis have pushed countries to accelerate decarbonization efforts in almost every part of the world.
- 2 The Energy Transition Accelerator Financing Platform, launched by the UAE and IRENA, is expected to support the energy transition in places that need it the most by securing at least US\$1 billion in funding to finance 1.5 GW of renewable energy projects by 2030.
- 3 The energy transition means different things to different countries and therefore requires different approaches.
- 4 To build and produce a lot of renewable electricity, countries need to strengthen their electrical grids. Between 20 percent and 50 percent of produced electricity is lost in weak and outdated grid infrastructures.
- 5 All fuels are going to be necessary in the energy transition because increasing energy efficiency will get us only part of the way there. Different fuels must be assessed with a pragmatic approach.

A photograph of a coastal scene at sunset. In the background, several large wind turbines are silhouetted against a bright, orange-hued sky. The turbines are situated on a dark, silhouetted hill. In the foreground, a sandy beach meets the ocean. Several people, including children, are wading in the shallow water. The overall atmosphere is warm and serene, with the golden light of the setting sun illuminating the entire scene.

**Unlocking economic
development for all**



“Collaboration between countries allows stakeholders to jointly identify, implement, and finance cross-border adaptation solutions, monitor and evaluate their effectiveness, and achieve synergies and cost savings. Successful adaptation initiatives need strong stakeholder engagement, the pooling of a wide range of expertise and resources, and the sharing of information and data.”

H.E. Sarah Ryglewski

Minister of State to the Federal Chancellor, Germany



To mitigate climate change, the world needs financial investments at greater levels than we have ever seen. The International Renewable Energy Agency (IRENA) estimates that US\$131 trillion needs to be invested by 2050 for the energy system to be compatible with the 1.5 degrees Celsius pathway; 80 percent of this figure must go into energy-transition technologies.

The decision to establish a loss and damage fund was a significant achievement at COP27. However, this facility is meant to be an addition to the US\$100 billion climate finance commitment set in 2009, rather than a part of it. The developing world has already expressed concerns over the unfulfilled promise of developed nations to mobilize US\$100 billion every year by 2020.

According to the Organization for Economic Cooperation and Development, developed countries mobilized US\$83.3 billion in climate finance in 2020¹¹. This was an increase on previous years but still below the US\$100 billion goal. Moreover, the developing world awaits clarity over how much money will go into the new loss and damage fund, and whether it will divert funds from adaptation commitments.

Selwin Charles Hart, Special Advisor to the Secretary General for Climate Action and Just Transition at the United Nations, stressed the massive need for the world to significantly scale up finance for adaptation and for loss and damage. “The reality is that the global financial system is broken. Within the global financial system there is not an absence of liquidity; the money is there. It’s just that it’s invested in either the wrong places or the wrong activities. So, how can we to shift that liquidity to the activities that are urgently needed to prevent the worst impacts of the climate crisis, while directing it towards countries and communities that need it most?” he said.

While the required financial investments are massive, so is the opportunity. According to the United Nations, transitioning to a green economy can yield substantial returns: an investment of US\$1, on average, yields US\$4 in benefits¹².

H.E. Dr. Sultan Ahmed Al Jaber, UAE Minister of Industry and Advanced Technology, Chairman of Masdar and COP28 President-Designate emphasized: "The road to net zero represents the biggest market transformation with the greatest economic promise since the first industrial revolution; a low-carbon pathway to a high-growth destination with inclusive growth for all."

Job creation is one of the major beneficial impacts of abatement strategies and initiatives. According to John Kerry, Special Presidential Envoy for Climate, US Department of State: "We have to be excited about [energy transition] because it means millions of jobs. The fastest-growing job in the United States of America for several years was wind turbine technician. The third-fastest-growing job was solar panel installer. There are extraordinary opportunities here if we will get our act together."

Frans Timmermans, the European Commission's Executive Vice President for the European Green Deal, highlighted that various sources of capital remain untapped, saying: "We need to unleash the huge potential of private investment that is out there, and which is still a bit on the fence. We need to ensure that we change the whole international financing system. Multinational development banks are not in a position to do what they need to do today. We're not using the potential of the International Monetary Fund that we could be using."

He added: "I don't understand why we could not use the special drawing rights of rich countries to empower African nations and other nations to invest to get rid of some of their debt. That would create an economic dynamic that would incentivize the private sector to invest trillions, and we need to invest trillions. The beauty of renewable energy is that return on investment (ROI) is much faster than with fossil fuels. Once you start investing, ROI kicks off in four or five years' time, and then you create this avalanche of investments that we need."



"One of the most important challenges is education. By educating and empowering global citizens, we can ensure that they are equipped to act to mitigate and adapt to the impacts of climate change."

**H.E. Dr. Nawal
Al Hosany**

Permanent Representative
of the UAE to IRENA





"One of the things that is going to judge us going forward in this space is transparency of capital flows and how well we allocate capital to not just the pure-play solutions of renewables and energy efficiency but also the transition journeys of other sectors, whether it's cement, steel, or energy. This will be an economy-wide shift."

Zoë Knight

Group Head of the HSBC Center of Sustainable Finance and Head of Climate Change MENAT, HSBC

30_m

jobs are expected to be created by the ACMI carbon credit scheme in Africa



In a special keynote address, H.H. Sheikha Shamma bint Sultan bin Khalifa Al Nahyan, Executive Director of the UAE Independent Climate Change Accelerators (UICCA), supported the development of a hybrid approach to climate financing, saying: "We believe the solution lies in a new approach to funding known as blended finance by merging private capital with development funding. Blended finance structures allow stakeholders to de-risk their investments while still investing with a purpose in addition to developing bankable projects and lowering the cost of investment. Blended finance can also support governments and private investors by attracting technical assistance and enhancing returns."

Emissions trading, a market-based approach to controlling emissions, has gained global traction in recent years. By using this scheme, a government provides economic incentives for reducing emissions whilst setting the cap across a given industry, or ideally the whole economy. Kazakhstan, which relies on coal for 70 percent of its electricity, was the first country in Central Asia to establish an Emissions Trading System (ETS). The scheme, launched in 2013, currently regulates about 40 percent of domestic CO₂ emissions.

H.E. Kassym-Jomart Tokayev, President of Kazakhstan, said that the ETS has proven to be an effective mechanism for stimulating changes in emissions-reduction and energy-efficiency technologies. "Our overall goal is to bridge the gap between the national and the European emissions trading systems. All these measures will ensure that the commitments of the Paris Agreement are fulfilled by 2030," Tokayev told delegates.

China, the world's largest emitter of CO₂ gas, is one of the latest countries to implement an ETS. The scheme, which became operational in 2021 and initially covered coal- and gas-fired power plants, allocates allowances based on the plant's generation output. The ETS is expected to cover up to 70 percent of total domestic emissions when heavy industry and manufacturing are included by 2025, according to data provider Refinitiv¹³. Once it expands to other sectors, China's ETS will cover more emissions than the rest of the world's carbon markets combined.

According to Timmermans, putting a price on carbon has incentivized energy businesses to decarbonize. "I believe the lesson for the world

could be that there's no way you can decarbonize without putting a price on carbon. I'm still amazed that the United States isn't doing this, a nation based on market-economy principles. We're now applying market-economy principles to the pricing of carbon and it's working well; I hope others will follow this example."

Alongside compliance carbon markets, voluntary carbon markets (VCMs) are also enabling industries to meet their emissions reduction targets. In these decentralized markets, private actors voluntarily buy and sell carbon credits that represent certified removals or reductions of greenhouse gas / carbon emissions. Today, there are 3,959 voluntary offsetting projects worldwide generating 1,303 million tons of CO₂-equivalent of emission reductions and removals, according to advisory body Climate Focus. This is equivalent to the average yearly emissions produced by about 911 coal plants¹⁴.

Carbon credits market expands exponentially

The Taskforce on Scaling Voluntary Carbon Markets, sponsored by the Institute of International Finance, forecasts that global demand for carbon credits will increase fifteenfold by the end of this decade, growing from US\$300 million¹⁵ in 2020 to exceed US\$50 billion¹⁶ in 2030.

With this promising outlook, the Africa Carbon Markets Initiative (ACMI) seeks to dramatically expand the continent's participation in VCMs. Launched at COP27, the scheme aims to produce 300 million new carbon credits annually by 2030. This would unlock US\$6 billion in income and support 30 million jobs.

"In Africa, while there's tremendous potential for carbon credits and getting to net zero, we're only utilizing 2 to 3 percent of what's technically possible. We see up to 35 percent growth potential for the carbon market. Developing the African Carbon Market Initiative seeks to unlock this opportunity while delivering on the climate commitment," Joseph Nganga, Vice President for Africa at the Global Energy Alliance for People and Planet, said



100m

people will benefit
from clean electricity
as a result of the UAE's
Etihad 7 initiative

to the audience during the Innovate program at ADSW. Nganga believes that carbon credits can serve as a valuable intervention that helps address various issues on the continent. For instance, they can help improve energy access, drive renewables by de-risking investments, generate health benefits, and even lead to improved soil through nature-based solutions. Carbon credits can also provide direct payments to communities and create new job opportunities across the low-carbon value chain.

ACMI secured US\$200 million in advanced market commitments from global corporates during COP27. In addition, seven African nations signed up to develop country carbon-activation plans, including Kenya, Gabon, Malawi, Mozambique, Togo, Nigeria, and Burundi. Since then, eight more countries have expressed interest in joining the program and additional corporate buyers are approaching commitment.

Renewable energy could make up roughly 80 percent of Africa's total energy capacity by 2050, especially as the cost of renewables decreases, the International Energy Agency (IEA) has forecast¹⁷. Yet nearly 600 million people in Africa have no access to energy today. Bringing renewables to every corner of the continent would mean transforming the lives of 600 million people.

To help African nations meet their fast-growing energy needs without the corresponding surge in greenhouse gas emissions, the UAE Ministry of Foreign Affairs and International Cooperation launched the Etihad 7 initiative at the ADSW 2022. The UAE-led innovation program is dedicated to securing funding for renewable energy projects in Africa and builds on the UAE's longstanding and deep ties with the continent. It aims to supply clean electricity to 100 million people by 2035 by raising funds from the public and private sectors for clean energy investment¹⁸.

"Just imagine if we could unleash the potential of a place like Africa – it would change the world and it would increase people's trust in renewable energy. It would mean development and economic growth without burning fossil fuels, without creating CO2 emissions, and it would alleviate some of the biggest problems we have on this planet, such as transforming the potential of the industrial revolution in actual economic growth," said Timmermans.



Damilola Ogunbiyi, CEO and Special Representative of the UN Secretary General for Sustainable Energy for All (SEforALL), sees VCMs as a transformative opportunity for Africa. However, she alluded to certain challenges that may hinder the market. “Do the project developers understand the opportunities they have? How are we going to scale up? How do we get verification done on a continent where the two largest verification companies currently do not have a presence at all? How do we deploy financing mechanisms to de-risk investment?”

Oliver Phillips, Africa and Middle East Lead for Sustainable Finance at Standard Chartered bank, also believes that carbon credits are going to be transformational in the short term in tackling the massive climate finance gap. “The fundamental reason why the carbon market is so interesting is the ability to influence projects and to make things happen,” Phillips told delegates during the Innovate program at ADSW. He added that Standard Chartered made an advanced market commitment to buying carbon credits through ACMI.

Philanthropic bodies can bring transparency

Moving to the role of philanthropic organizations in ensuring an inclusive energy transition, William Asiko, Vice President for the Africa Regional Office at the Rockefeller Foundation, highlighted the importance of integrity, transparency, and sustainability in the success of VCMs. “In order to get transparency and integrity, you need to demonstrate that a platform has been established without any vested interest. For the Rockefeller Foundation, our model has always been around how we use philanthropic capital to attract government policy commitment and private sector investment. We believe that with those two you can have long-term sustainability, regardless of the sector. It means you have to have government and private sector working together whilst having the confidence that if they make advanced commitments, they will produce the desired results. To create that, you need to move towards establishing an engine room that will deliver on those commitments,” Asiko told delegates.

This is where philanthropic capital can come in, he noted. It can bridge that gap, bringing the government and private sector together in funding activities that private commercial capital and public sector capital alone may not have the resources to finance.

Meanwhile, the Qatar-based Global Carbon Council has been receiving a growing number of project submissions since getting approved under the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) in 2021. As the region’s first voluntary carbon offsetting program, the Council provided the majority of credits to offset emissions from the FIFA World Cup Qatar 2022 tournaments.

Kishor Rajhansa, Chief Operations Officer at Global Carbon Council, said the Council’s VCM program has been registering projects from around the world. He said: “Almost 1,500 projects have been submitted and we’re expecting to issue about two billion carbon credits in the next 10 years.” Additionally, the Global Carbon Council is establishing a carbon finance facility that will be operated by a major trading company – a third party that will be setting the expectation for the market in terms of carbon price and acting as a bridge between the project owner and buyer.





“Why [are] carbon credit markets not working at the moment for energy? Because there’s been far more work done on the nature side of carbon markets with regard to developing/emerging countries than energy. Far more money is flowing to that than to energy.”

Andrew Steer

President and CEO
Bezos Earth Fund



PepsiCo, the world’s second-largest food and beverage company, with about 300,000 employees and operations in over 200 countries, has pledged to reduce emissions across its value chain by more than 40 percent by 2030, and to reach net zero by 2040. As one of the largest buyers of agricultural commodities, the company’s agricultural footprint is significant.

Eugene Willemsen, CEO for Africa, Middle East, and South America at PepsiCo, who was part of a panel at the ADSW Summit, explained: “There’s a massive effort that we’re putting into converting the equivalent of the land that we’re using, to grow our crops through regenerative agricultural practices... In agriculture, one of the big unlocks that I’m really hoping we can drive this year, also as we gear up for COP28, is to get [renewable] power purchase agreements approved across the major economies in Africa, Middle East, and South Asia.”

Highlighting the role of the financial industry, Zoë Knight, Group Head of the HSBC Center of Sustainable Finance and Head of Climate Change MENAT, HSBC, told delegates at the Atlantic Council Global Energy Forum: “We [banks] have to share the ideas and solutions that are coming from here, Europe, the US, and Asia to be able to package finance in a way that is meaningful for on-the-ground solutions. If we don’t do that effectively, we have no chance of scaling to meet the global and local financing needs.”

Accelerating inclusive climate change while unlocking economic development also requires human capital investment and cross-sector partnerships that pool together knowledge, skills, and resources.

“In the geography that I look after – Africa, Middle East, and South Asia – it becomes a lot more complicated because in many cases we work with small farmers. In India alone, we work with about 22,000 farmers directly. So, it requires a lot of skill building, investment in proper irrigation and growing techniques, and different fertilizers. Of course, we need to partner with other stakeholders in our value chain,” said Willemsen.

Adrian Grenier, an American actor-turned-environmental activist, explained how his impact fund DuContra Ventures chooses projects to support by evaluating not only the return on investment, but the intangible values within each company, such as employees’ personal

growth and human flourishing. He described this as “yields beyond money”, or the inestimable value derived from doing business that is heart centered and nature aligned.

Speaking at the inaugural Zayed Sustainability Prize Forum at ADSW, Grenier said: “Through DuContra we invest in four verticals: human flourishing, sustainable consumption, the future of finance, and communities. We believe that better humans make a better world, so can we invest in the individual? Can we give them the tools to be the best that they can be? Money is the tool, it’s what we use to create the world, so [we give them] tools of finance and of equity and access so that we can hand that individual the tool to go build it. And then communities – how do we bring them together with others? If we can bring people together and give them the tools and support the individual, then they’re going to go out and build the world from a higher place of understanding.”

Access to safe drinking water

Only 16 percent of the world’s climate finance needs are being met, according to the Rockefeller Foundation¹⁹. One in three people globally lack access to safe drinking water, according to the World Health Organization (WHO)²⁰. Around 733 million people lack access to electricity²¹, according to the Tracking SDG 7: Energy Progress Report, and one in nine people are hungry²², according to WHO.

In this context, the Zayed Sustainability Prize, a pioneering bi-annual global award managed by Masdar, recognizes and rewards small to medium-sized enterprises (SMEs), nonprofit organizations (NPOs), and high schools with outstanding global sustainable solutions. Through its 96 former winners, the US\$3 million prize has transformed the lives of more than 378 million people around the world since its establishment in 2008, including in Vietnam, Nepal, Sudan, Ethiopia, Maldives, and Tuvalu.



US\$3m

Zayed Sustainability Prize has transformed the lives of over 378m people worldwide



"While women are over-represented in the agricultural sector, they are under-represented in the green energy sectors and in climate leadership. Financial institutions have a key role to play in assessing the market requirements and ensuring gender equal access to climate finance through policy-level changes and implementation of initiatives."

Ines Rocha

Managing Director, Impact and Partnerships, European Bank for Reconstruction and Development

1%

increase in the share of female corporate managers cuts CO2 emissions 0.5% - ECB



ADSW 2023 marked the 15th anniversary of the Zayed Sustainability Prize, which awarded 10 winners. One of them was Brazil's Associação Expedicionários da Saúde, an NPO that received the health-category prize for its Mobile Hospital Complex, which provides medical and surgical care for indigenous communities geographically isolated within the Amazon. Another winner was Ynsect, a French SME that produces insect protein and natural insect fertilizers, with Europe's first of its kind factory equipped with vertical farming and an integrated biorefining setup. In the Energy category, Jordan's NeuroTech was awarded for its development of its AI-based algorithms with a blockchain-based transaction system to bring reliable energy access to refugee camps. LEADARS (Local Environment Development and Agricultural Research Society), an NPO from Bangladesh, secured the Water category win for its integrated water resource management model that solves water scarcity issues in disaster-prone areas.

Investing in youth is equally critical to achieving inclusive, equitable and sustainable development for present and future generations. To this end, Youth 4 Sustainability (Y4S), a Masdar outreach platform, invests and actively supports the development of young people.

"Y4S was established by Masdar in 2016 to ensure that young people can play their part in building a sustainable future. Through this program Masdar is preparing young future leaders for the jobs of tomorrow. Today, nearly 20,000 students have been engaged through Y4S programs; that's 3000 potential future leaders every single year. Y4S is fostering collaboration between us from the UAE and peers around the world. It's also connecting young people with global leaders across industry and governments," Mohamed Jameel Al Ramahi, CEO of Masdar, told delegates at the ADSW Y4S Hub. Today, there are 1.2 billion young people aged 15 to 24 years, accounting for 16 percent of the global population, UN statistics

show. By 2030 — the target date for the Sustainable Development Goals (SDGs) — the number of youth is projected to have grown by 7 percent, to nearly 1.3 billion.

The Y4S Hub at the ADSW 2023 is estimated to have attracted over 3,000 participants aged 18 to 35. Addressing the Y4S Hub, Sheikh Dr. Majid Al Qassimi, Founding Partner at Soma Mater, a UAE-based advisory providing intelligence in agriculture investment and policy in the Middle East, said: “First and foremost, engaging in in these kinds of summits or meetings is critical because at least you’re getting contact with policymakers. You can ask questions that spur on more action. Don’t discount your voice, even a single individual is able to move policy. On top of that, today, you’re all interning or working somewhere; you have a voice there. Make sure that you’re engaging, whether it’s within sustainability initiatives or when you can engage with government entities – regulators that are shaping the policy around you.”

Investing in youth

Zainab Al Ali, Head of Outreach and Stakeholder Relations at Masdar, highlighted that Masdar is not only a renewable energy company, but also an organization that produces the future generation leaders. “What we’re doing today is bring youth from all over the world, all united to drive climate action. Y4S invests in young people. We lead by action, we are inclusive, we build resilience and invest in the future skills, and we maintain the youth’s skills to enable them to become the leaders that not only the UAE but also the world needs to start changing.”

To ensure that the youth’s perspectives, vision, and skills are included in climate-action initiatives, the UAE appointed Shamma bint Suhail bin Faris Al Mazrui, Minister of State for Youth Affairs, as the COP28 Youth Climate Champion, an important milestone in the ongoing engagement with young people across the world. Commenting on this appointment, H.E. Mariam Almheiri, UAE Minister of Climate Change and Environment, stated at the Foodtech Challenge: “For the first time ever, we have a youth climate champion in the UNFCCC process. We hope that this step inspires a new trend for countries so that there will always be a youth champion adding the youth’s voice into the mix.”

Meanwhile, various studies have shown that women can positively influence the crucial political decisions regarding climate change and that their leadership in the private sector is linked to greater transparency around climate impact. Just a 1 percent increase in the share of female corporate managers leads to a 0.5 percent decrease in CO2 emissions, a study by the European Central Bank found²³. Furthermore, expanding women’s access to productive resources can multiply agricultural yield and enhance food security whilst reducing carbon dioxide emissions, according to a UN report²⁴.

Despite constituting half of the world’s population, women are still under-represented across the sustainability board. In 2019, women accounted for about 32 percent of the global renewable energy workforce, statistics from the International Renewable Energy Agency show²⁵. The same trend can be seen across climate forums. At COP26 in Glasgow, only 7 percent of world leaders attending the conference, and 34 percent of committee members were women, according to non-profit organization SHE Changes Climate²⁶.





In this context, Masdar established the “Women in Sustainability, Environment and Renewable Energy” (WiSER) initiative in 2015. The outreach platform, launched on the sidelines of the 70th UN General Assembly, was founded on the pillars of education, engagement, and empowerment. Its advisory council comprises authoritative figures from business, government, and academia who share the aspiration to increase women’s participation and leadership in the sustainability field.

“Growing up, we didn’t have organizations like WiSER to look up to and the diversity of it all makes it so special. Women are going to make this energy transition; they are going to solve these climate problems; and they will be at the helm of affairs and leadership to drive this change,” Ogunbiyi told delegates at WiSER Annual Forum, which focused on theme ‘empowering women to lead climate adaptation’. Ogunbiyi is one of the influential women advancing the global sustainability agenda and who have endorsed the #IAmWiSER campaign when it launched in October 2022. The campaign called on policymakers, heads of industry, and individuals to take the pledge to champion women as agents of sustainable change.

Clearly, investing in inclusive climate action would go far toward building a sustainable economy, unlocking new opportunities and jobs, and creating ripple effects throughout food and energy systems.

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Unlocking economic development for all

Key outcomes

- 1 Renewable energy can deliver return on investment (ROI) much faster than fossil fuels can, thereby facilitating the avalanche of investments that the world needs for climate mitigation.
- 2 Voluntary carbon markets are proving transformational in that they are enabling industries to meet their emissions reduction targets while financing climate-action projects.
- 3 Deploying renewables throughout Africa could help transform the lives of 600 million people who have no access to energy today.
- 4 Philanthropic capital has the potential to bring the governmental and private sectors together to fund energy-transition activities that private capital and public-sector capital may not have the resources to finance.
- 5 Accelerating inclusive climate change whilst unlocking economic development requires human capital investment and cross-sector partnerships that pool together knowledge, skills, and resources.



**Innovation can ease
sustainability challenges**



Technology innovation is central to putting the world on a sustainable path. Across the world, companies are increasingly embarking on projects that are disrupting the tech space, making key contributions to the global tech ecosystem, and playing a vital role in helping achieve net zero.

Acknowledging the role that technology providers play in enabling the energy transition, Mohamed Al Ramahi, Chief Executive Officer of Masdar, told delegates: "The innovators, the technology providers, the people who provide the solutions – without them, we will not be able to deploy anything. I really thank all of you for providing us with the right tools to develop these great projects, and we need more."

With the Global Stocktake set to be one of the major highlights of COP28, Ann Mettler, Vice President for Europe at Breakthrough Energy, stressed the need for greater emphasis on how to speed up technology deployment. "We're not on track to perhaps think of a technology stocktake. What are the technologies that are in the pipeline today? Imagine how much worse of a situation we would be in today if we didn't have wind, solar, or batteries. But then imagine how much better of a situation we would be in if we had clean hydrogen, if we had storage solutions, carbon dioxide removal technologies, and sustainable fuels. We would be in a much stronger position. For me, looking at how we can accelerate the deployment of these technologies should be a key focus of COP28," Mettler told delegates.

Indeed, transitioning to a carbon-neutral future requires leaps in technology innovation through research and development, demonstration, and deployment. According to Lorenzo Simonelli, Chairman and CEO of energy technology company Baker Hughes,



"Innovation is key to solving many of the planet's problems. Young people, with their energy and curiosity, are well placed to develop and lead innovative solutions and it is our duty to help and support them to do so."

**H.E. Eng. Awaidha
Murshed Al Marar**

Chairman of the Abu Dhabi
Department of Energy

40%

of energy efficiency
and CO2 reduction
can be achieved using
today's technologies

the energy transition boils down to three key pillars over the course of the next decade. “The first is to transform the core, to be able to drive energy efficiency with available technology that’s here today, such as zero-leak valves, upgrades in compression, and carbon capture, utilization, and storage. In fact, if you look at an IEA study, over the course of the Paris Agreement, 40 percent of the energy efficiency and reduction in CO2 is going to be achieved by technology we have today, so we have to implement it and scale it,” Simonelli told delegates.

“Secondly as we look at the role of natural gas, I think we sometimes forget the lessons we’ve learnt from the past. The way in which the US and Europe have been so successful in reducing their emissions has been by transitioning from coal to natural gas. Natural gas should not be viewed as a transition, but also as a destination fuel and should not be vilified. It is the opportunity we have right now as a cleaner hydrocarbon to help us along this transition, and there are ways in which we can eliminate CO2 and methane from the LNG and natural gas production. Then, it’s the investments that are needed in new technology.”

According to the IEA, most of the global reductions in CO2 emissions through 2030 can come from technologies that are readily available. However, this is not the case beyond 2030. Almost half the reductions by 2050 are expected to come from technologies that are presently at the demonstration or prototype phase, with advanced batteries, hydrogen electrolysis, and direct air capture and storage being the most promising areas.

H.E. Sharif Salim Al Olama, Undersecretary for Energy and Petroleum Affairs at the UAE Ministry of Energy and Infrastructure noted that hydrogen has long been positioned as the fuel of the future. “With global momentum picking up to achieve decarbonization driven by new targets, regulations, and technological advancements, that future is now. The potential for green hydrogen is vast, with global demand expected to reach 30 million tons per annum by the year 2030, and over 600 million tons by the year 2050. This represents 12 percent of the total global energy demand,” Al Olama told delegates at the ADSW Green Hydrogen Summit.





Capturing the maximum climate value of hydrogen requires a tripling of investments in hydrogen projects by 2030 to US\$700 billion, according to the Hydrogen Council's 2022 report²⁷. This amount is equivalent to less than 15 percent of investment committed to upstream oil and gas over the past decade. Yet only 3 percent of the required capital is currently committed to hydrogen projects.

"The UAE has set an ambitious target of becoming one of the top 10 global hydrogen producers by the year 2031, and we are taking concrete steps to make this target a reality," highlighted Al Olama. He added that to unleash the potential of green hydrogen, the industry needs to address some of the pervasive challenges, for example by reducing the cost of production, improving transportation and storage, and ensuring safety.

In the UAE, Masdar established its green hydrogen business in 2022 and set a target to produce one million tons of green hydrogen a year by 2030. "Masdar now wants to take to embark on the journey of green hydrogen and I'm proud to be appointed as the chief green hydrogen officer, the lead on the green hydrogen spectrum. I've been playing that role for the past two years, and in that role, we need to reposition Abu Dhabi as a leader in the green hydrogen energy transition," Mohammad Abdelqader El Ramahi, Director, Asset Management and Technical Services at Masdar, explained at the ADSW Y4S Hub.

"We want Abu Dhabi to embark on the fifth wave. The first wave was the production of oil, then natural gas and LNG, then renewables, then nuclear and now green hydrogen. To embark on this journey and establish a knowledge-based economy, we need to transfer this knowledge to the youth. We want to create multiple resources of technologies, where we become producers rather than consumers, and contributors to the evolution of the technology, not just passive investors," explained El Ramahi.

China's Envision Group, which is building one of the world's largest green hydrogen and green ammonia projects in Inner Mongolia, has succeeded in reducing the high cost of green hydrogen.





“As Large Ocean States, SIDS must exhilarate the development of Ocean Energy Technologies and look into emerging technologies such as green hydrogen battery storage and the exhilarated development of other renewables such as geothermal, solar, wind, biomass, and hydro-energy policy and regulatory frameworks including fossil fuel mitigation.”

H.E. Surangel Whipps Jr.

President of Palau



With phase one set to be commissioned mid-2023, the industrial park will use 100 percent renewable energy, including solar, wind power, and energy storage, for production and operation activity by high energy-consuming industries. Once fully developed by 2025, the project will produce more than 1.5 million tons of green ammonia.

Speaking at the ADSW Summit, Lei Zhang, CEO of Envision Group, elaborated on how the company has achieved cost reductions: “It’s commercially viable. We’re able to deliver green hydrogen at US\$1.5 per kilogram. And the final product of green ammonia costs US\$500 per ton [versus US\$800 a ton in Europe today²⁸]. This comes from our latest innovation which is called the net-zero industrial park. We’ve basically created a renewable energy system plus hydrogen and green ammonia production.”

Rationalizing the costs of renewables

Zhang believes that the best way to unlock the potential of renewables is to build industrial parks in remote areas, combining wind, solar, storage, and hydrogen together with independent energy demand, such as refining of copper or nickel materials to make batteries. This combination would reduce the transition cost by eliminating the cost of high-voltage transmission, utilizing the lowest cost of renewable energy and using hydrogen as both a product and storage to balance the renewable energy system.

“The future of renewable energy is going to come from off-grid solutions. We need to build independent renewable energy solutions which will make our hydrogen as well as our aluminum and final products cheaper, while being emission-free. It’s already feasible now. The private sector has the responsibility to demonstrate commercial viability. Who is bringing wind and solar energy from 20 cents to 1 or 2 cents today? It’s the private sector,” said Zhang.

Studies by the University of Minnesota found that using green ammonia for fertilizer, fuel, and heat could drive down farming’s carbon footprint by as much as 90 percent for corn and small grain crops²⁹. But the reach of this zero-carbon fuel is set to expand far beyond farms. The IEA estimates that to get to zero emissions by



2050, hydrogen-based fuels, including ammonia, should account for nearly 30 percent of transport fuels by 2050, up from zero today³⁰.

Transport has the highest reliance on fossil fuels of any sector and accounted for 37 percent of CO₂ emissions from end-use sectors in 2021, according to the IEA³¹. The use of hydrogen as a fuel, particularly green or blue hydrogen, could be the key to decarbonizing road transportation.

Jean-Baptiste Djebbari, Chairman of Hopium, the first manufacturer of high-end hydrogen-powered vehicles in France, and Former French Minister for Transport, said that his company wants to achieve electrified transport, using battery electric vehicles and hydrogen fuel-cell systems. Speaking at the Green Hydrogen Summit, he said: "Because we need so much electricity, we need both. The main idea a few years ago was that hydrogen would only be for heavy mobility, buses, trains, and one day aviation, and light vehicles would be only about electric battery features. Now that it's been reshuffled, we see that we need to go full speed to both ways of producing green energy and electricity, and hydrogen will be a key player in it.

Gauri Singh, Deputy Director-General at IRENA, noted that green hydrogen was gaining huge momentum. "If I look at some of the signs in terms of how this momentum is real rather than just hype, I'd say look at the kind of acquisitions that are happening around. You're looking at real money flowing into entities that hold a future for producing hydrogen," Singh told delegates.

While the industry still lacks the electrolyzer capacity that is needed to meet the expected green hydrogen demand of 150 million tons per year by 2030, this capacity is growing very fast. "There's real investment going into it. There are incentives being put on the table by governments who are keen to attract investments into manufacturing, and that's also growing at a rapid pace," said Singh.

In the field of waste management, innovation-driven companies are helping consumers avoid the use of single-use plastics while



"Finance is important and the investors can play a big role, but investors cannot be the starting point of innovation. We really need to have the businesses and also governments to promote innovation so that the financial investor can accelerate the transition."

Hiro Mizuno

CEO, Good Steward Partners,
and UN Special Envoy on
Innovative Finance and
Sustainable Investments

30%

of transportation fuels
should be hydrogen-
based to reach net
zero by 2050, says IEA

preventing the plastic waste from reaching the oceans. For example, US-based Blueland has created eco-friendly home-cleaning products by compressing these into tablets. When dissolved in water, the tablets allow consumers to refill a “forever bottle” rather than discarding plastic container after plastic container. With these products, the company has helped to eliminate almost two billion single-use plastic bottles from landfills and oceans since 2019³².

Blueland is one of the companies that DuContra Ventures — an impact fund founded by American actor and investor Adrian Grenier, alongside venture capitalist Ba Minuzzi — has invested in. “Blueland is one of my favorites. They send you a compressed tablet, so they’re not shipping water around, and you basically take the compressed tablet and add water to it at home to reconstitute it. [The process generates] less carbon footprint when they ship it, it’s zero plastic, and it’s non-toxic,” Grenier told delegates.

Bringing AI to bear on climate efforts

When it comes to digital technology, the use of artificial intelligence (AI) could greatly contribute to climate-change mitigation efforts, according to Jihad Sadiq, Founder and Director General of FortyGuard. The UAE-based cleantech startup is building an AI-powered platform to reduce street-level temperatures and cool down cities. Its pilot project with Masdar City has allowed it to test the data collection process in a stable urban setting. Sadiq believes that AI will enable the world to monetize on passive existing temperature data across the globe. “We believe that what gets measured gets improved, and the best solutions come from the understanding of data,” he told delegates at Innovate.

Innovate, Masdar City’s global initiative to support clean-tech companies, showcased a range of cleantech startups and enterprises at ADSW 2023. The three-day exhibition was supported by Masdar City’s startup accelerator program, The Catalyst, which provided 22 participating companies with the chance to pitch directly to an investment committee and win up to US\$200,000 in funding. FortyGuard was one of them. The startup, which launched in 2020, landed Masdar City as their first client through Innovate 2022, and several other deals followed.



DANA Venture Builder, an Abu-Dhabi-based venture builder and investment platform for women-led startups in desert tech, was another company featured in Innovate, specifically at the agritech showcase. The company is establishing its first beta site in Masdar City to test the feasibility of early stage agritech projects that can be developed in the UAE capital.

Katie Wachsberger, Co-founder of DANA, noted that one in seven entrepreneurs internationally were women. "It's not a very promising statistic. But when we look at the sectors of sustainability, specifically as pertains to agriculture and food production, we see that the statistics are one in four. We're seeing a lot more women, especially from this region, getting involved in sustainability as founders, as entrepreneurs and even as investors," Wachsberger said.

In conclusion, now is the time to prepare for the next phase of the transition by boosting innovation in new and emerging technologies. Stronger and inclusive policies, mandates, and standards, along with national targets and competitive auctions, can drive industry investment into the most efficient climate-focused solutions, ultimately speeding up the deployment of clean energy technologies.



22

startups pitched at
Masdar accelerator
The Catalyst at
ADSW 2023

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Innovation can ease sustainability challenges

Key outcomes

- 1 Accelerating the deployment of clean-energy technologies needs to be a key focus of COP28, potentially through a 'technology stocktake'.
- 2 To unleash the potential of green hydrogen, the industry needs to address pervasive challenges related to the cost of production, transportation, safety, and storage.
- 3 Masdar established a green hydrogen business in 2022 and is targeting the production of one million tons of green hydrogen a year by 2030.
- 4 Innovation-driven companies are helping consumers avoid the use of single-use plastics and preventing plastic waste from reaching the oceans.
- 5 The private sector has the responsibility to demonstrate commercial viability and to bring down the cost of new technologies.

APPENDIX – KEY EVENTS AT ADSW



International Renewable
Energy Agency (IRENA)
Assembly



Innovate



Atlantic Council Global
Energy Forum



Foodtech Challenge



The ADSW Opening
Ceremony and Zayed
Sustainability Prize Forum



Women in Sustainability,
Environment and Renewable
Energy (WiSER) Forum



ADSW Summit



Green Hydrogen Summit



WFES Forums
and Exhibitions



Abu Dhabi Sustainable
Finance Forum



Youth 4 Sustainability Hub



The Festival at Masdar City



Abu Dhabi Sustainability Week (ADSW) is a global initiative championed by the UAE and its clean energy powerhouse Masdar to accelerate sustainable development and advance economic, social and environmental progress.

Established in 2008, ADSW provides a global platform for all who have a stake in the future of our planet. ADSW brings together leaders from across governments, the private sector and civil society, to discuss and engage on bold climate action and the innovations that will ensure a sustainable world for future generations.

ADSW is not only a premier convenor for global dialogue, but a catalyst for concrete results, providing multi-stakeholder platforms where thought leadership can evolve into thoughtful action.



Abu Dhabi Future Energy Company (Masdar) is the UAE's clean energy champion and one of the largest companies of its kind in the world, advancing the development and deployment of renewable energy and green hydrogen technologies to address global sustainability challenges.

Established in 2006, Masdar is today active in over 40 countries, helping them to achieve their clean energy objectives and advance sustainable development. Masdar is jointly owned by Abu Dhabi National Oil Company (ADNOC), Mubadala Investment Company (Mubadala), and Abu Dhabi National Energy Company (TAQA), and under this ownership the company is targeting a renewable energy portfolio capacity of at least 100 gigawatts (GW) by 2030 and an annual green hydrogen production capacity of up to 1 million tons by the same year.

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