Webinar: Space Acting for Decarbonisation (SA4D)

04 May 2022 | 11:00 CET

ESA Hosts:
Davide Coppola
Kavitha Muthu
Liz Barrow

Guest Speakers:
Chiara Mingoli, ENEL
Andre Ramalho, United Nations Global Compact/The Pacific Institute

Webinar hosts

Davide Coppola

Kavitha Muthu

Liz Barrow

Welcome to the Webinar!

SPACE SOLUTIONS

Before we start...

- Due to number of attendees, please keep your microphones muted during the webinar and make sure your webcam is switched off.

- You can use the conversation function anytime to submit your questions. They will be addressed during the Q&A at the end of the webinar

Space Acting for Decarbonisation (SA4D)

Agenda

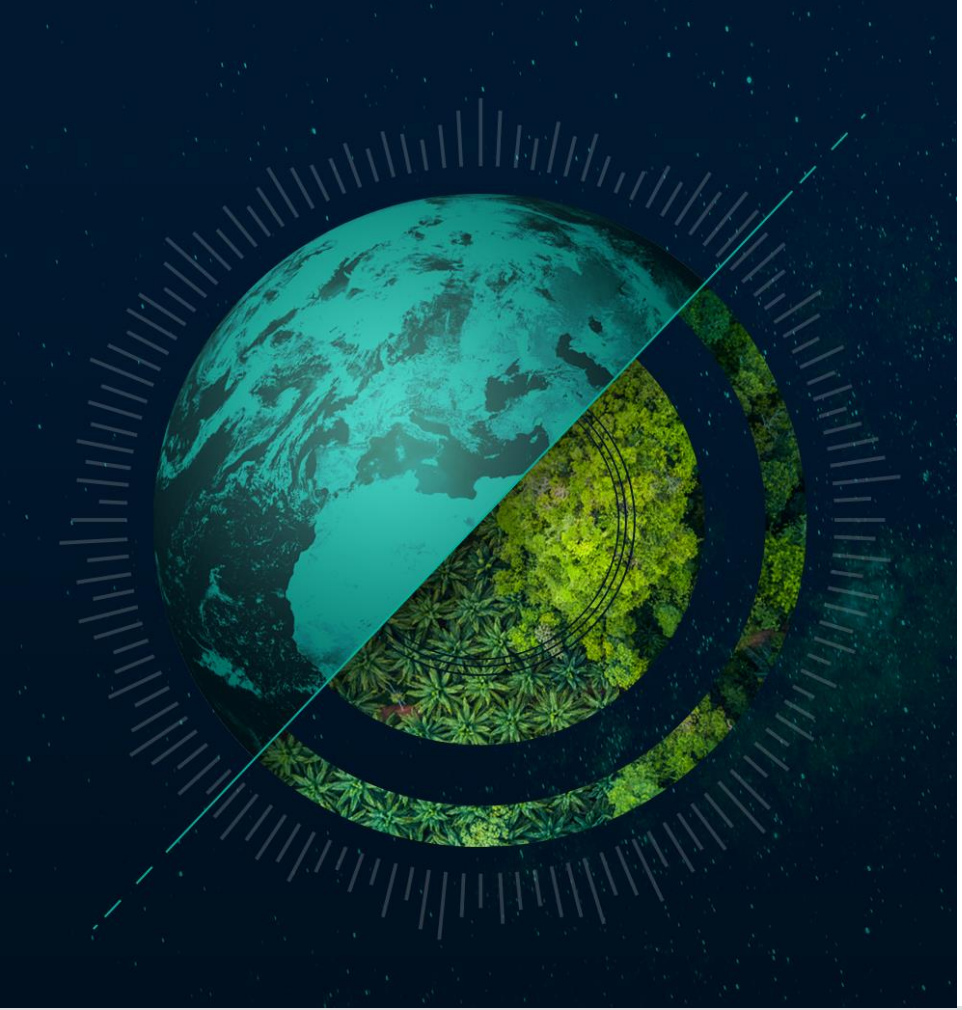
1. Introduction
2. ESA Space Solutions
3. Space Acting for Decarbonisation (SA4D) - Enabling Study
4. Our Guest Speakers
5. How to Apply
6. Q&A

ESA SPACE SOLUTIONS

esa
SPACE SOLUTIONS

The largest space innovation network in the world

- The go-to place for great business involving space to improve everyday life.
- Supporting European start-ups and SMEs to develop businesses using space technology and data.
- Offering funding, business and technical support to help to generate successful business and create jobs.



ESA SPACE SOLUTIONS OFFERS

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SPACE SOLUTIONS

- Zero-equity funding (from €50k to €2M+ per activity)
- A personalised ESA consultant
- Technical support and commercial guidance
- Tailored project management support
- Access to our international network of ESA and partners
- Access to our network of investors
- Credibility of the ESA brand

Space tech, users & markets

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Space Technology

- Earth Observation
- Satellite Navigation
- Satellite Communication
- Spaceflight Technologies
- Space Weather

Big Data analytics

VR/AR

Artificial Intelligence

Mega-constellations

Crowdsourcing

IoT

Cybersecurity

Blockchain

5G

https://artes.esa.int/esa-5g6g-hub

Users & Market

- Maritime
- Agriculture
- Environment
- Healthcare
- Financial
- Transport
- Education
- Media
- Energy
- Aviation

ESA BUSINESS APPLICATIONS

Zero-equity co-funding up to €2M

- **Demonstration Project**: Mature value proposition & business plan and demo your service with customers.
  - Up to 50% co-funding*
- **Feasibility studies**: Explore ideas, create a business plan & connect with potential users.
  - Up to 50% co-funding*
  - 100% funding under Competitive Tender
- **Enabling Studies**: Engage with users, consolidate the business opportunity and develop roadmap for implementation.
  - 100% funding under Competitive Tender
- **Kick-starts**: Thematic activities.
  - Up to 75% co-funding

* Up to 80% for SMEs (pending specific initiative and approval of National Delegation)

ESA AGENDA 2025 & TIA VISION

ESA Strategy

DG's Agenda 2025 target to boosting commercialization for a green and digital Europe fostering development of digital technologies and applications addressing the EU Green Deal targets, including:

- **sustainable and smart mobility** (connected and automated, multimodal transport)
- a fully integrated, interconnected and **digitalized European energy market**

TIA Vision – Towards *Digital & Green* Space

"*ARTES to foster the **Digital & Green** transformation through satellite communications for the next decade, by fostering new digital technology, products, services & applications which help all economic sectors in Europe (including Space) meet the Environmental targets of the EU and ESA Member States*"

“Space Acting for Decarbonisation” Enabling Study

Overall aim of the “Enabling Study”

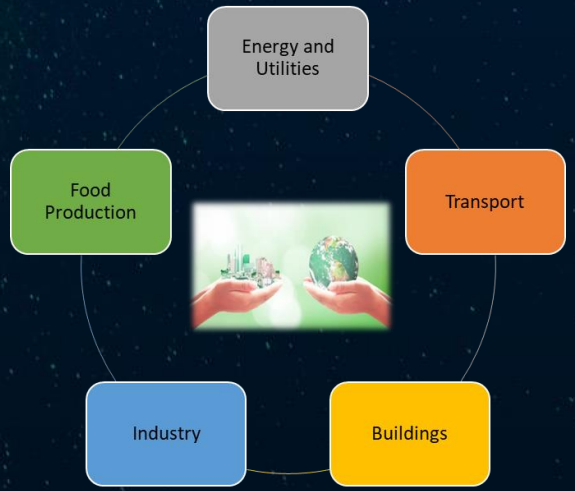
Space Acting for Decarbonisation (SA4D): Background

esa SPACE SOLUTIONS

As the climate crisis becomes unignorable, there is an unprecedented need to deliver sustainable, green and inclusive economic growth to meet the challenge of decarbonising our economies.

The scope of "Space Acting for Decarbonisation" enabling study

- Definition of customer/users/stakeholders needs and opportunities for sustainable space-based solutions in key Green House Gas (GHG) generating sectors.
- Identify requirements for SatCom, SatEO and SatNav
  - Upstream space systems (Enhanced/New mission concept)
  - Downstream (Space-based product/service) and/or
  - Integration of new technical developments such as AI, IoT, Digital Twins.
- Develop a road map for implementation of the short and long-term technical concept(s) in cooperation with customer champions.



Space Acting for Decarbonisation (SA4D): Topics

Addressable Greenhouse Gas (GHG) generating sectors

- Energy and Utilities: The Energy sector is the highest contributor to Green House Gas (GHG) emissions and accounts for 34% of total net anthropogenic GHG emissions. It is a complex sector and the total decarbonisation target will require a combination of multiple technologies.
- Transport: Transport accounts for about 15% of total net anthropogenic GHG emissions. Major decarbonisation pathways for transportation include switching to lower-carbon fuels such as electric cars and improving system-wide efficiency through the use of autonomous vehicles.
- Buildings: Buildings contributes to 6% of total net anthropogenic GHG emissions. The goal of total decarbonisation in the buildings sector includes the construction of new buildings and districts with zero or almost zero energy consumption from fossil fuels and the total renovation of existing buildings with the same net zero carbon standards.

Space Acting for Decarbonisation (SA4D): Topics

Addressable Greenhouse Gas (GHG) generating sectors

- Industry: The industry sector contributes to 24% of total net anthropogenic GHG emissions. Fully decarbonising such complicated and integrated industrial environments requires a multidimensional approach.
- Food Production: Together, agriculture, forestry and other land use (AFOLU) are responsible for 22% of GHG emissions. Decarbonising agricultural requires change in production practices and minimising land use change.

The Power of Space

SPACE SOLUTIONS

SatCom can accelerate the grid modernisation towards smart(er) grids to implement real-time monitoring and control of the grid and its nodes, often in remote locations which are the key functions for managing renewable energy resources to achieve decarbonisation.

Advanced models of Earth and human system processes integrating huge amounts of SatEO data together with non-space data can provide a comprehensive and accurate actionable information to decision makers for decarbonisation.

Accurate and reliable satellite-based Position, Navigation and Time (PNT) information is critical to ensure connected, cooperative and automated mobility and transport corresponding to reduction in carbon footprint within the transport domains. It can also be used to locate where the emissions measurements are taken.

Space data together with cutting-Edge digital technologies such as Edge computing, Artificial Intelligence, Augmented Reality/Virtual Reality, quantum computing and IoT will be essential to generate actionable information for decarbonisation which can be initiated, visualised, implemented and monitored.

Guest speaker #1

Chiara Mingoli

Sustainability Ecosystem Manager

Enel Green Power

chiara.mingoli@enel.com

Enel's roadmap to Net-Zero and the Global Alliance for Sustainable Energy

Space Acting for Decarbonisation (SA4D) - webinar
4th May 2022

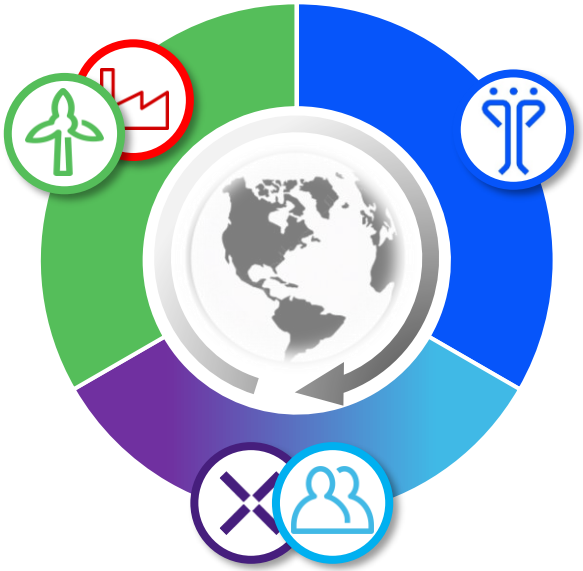
Chiara Mingoli - Sustainability Ecosystem Manager
Enel Green Power

Global Alliance for Sustainable Energy

Enel business

Global Power Generation

Accelerates a sustainable energy transition, increasing **renewables** capacity growth and **decarbonizing** our fleet



Enel X

Enables the energy transition boosting electrification and decarbonization of customers, by providing **innovative services** and **system flexibility**

Global Infrastructure & Networks

Guarantees reliability and quality of service in the energy supply, through **efficient**, **resilient** and **digital** networks

Global Energy & Commodity Management

Optimizes the Group margin as a single portfolio, finding its **best balance**

Retail

Increases customer value through commodities and “beyond commodities” services also thanks to **customer satisfaction and experience** improvement

Enel's leadership

1˚ operator in **distribution grids**

The greatest operator in **renewables**[2]

The operaor with the largest **clients** base worldwide[3]

 # Countries of presence

31

 # Users

75 mln

Renewables capacity

54 GW

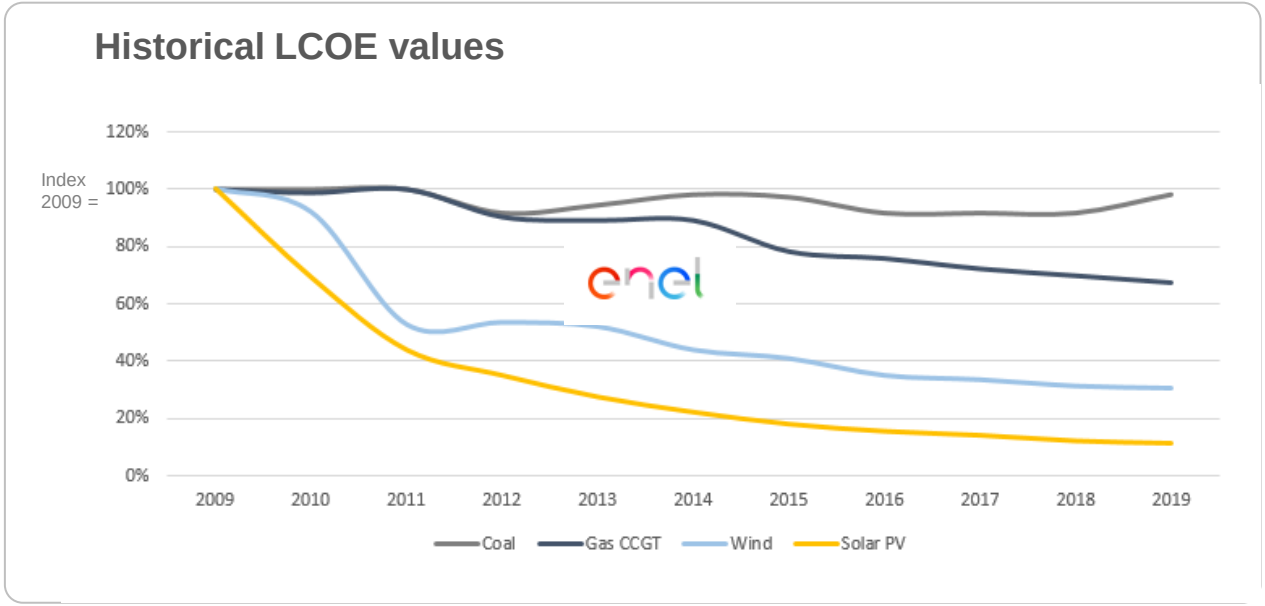
 # Customers

69 mln

1. For number of customers. Excluding public operators
2. For installed capacity. Includes 3.3 GW managed capacity
3. Including free market electricity and gas customers

2010-2020: Decade of renewable energy

Levelized Cost Of Energy comparison: a quiet revolution

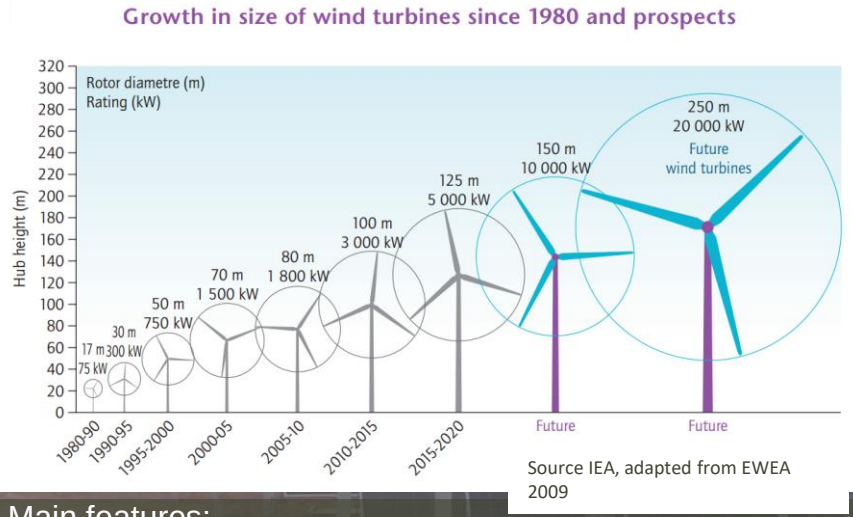


Costs of wind and solar PV technologies decreased 60-80% in 8 years with capacity additions growing exponentially

Source: Lazard

Technology evolution

Wind



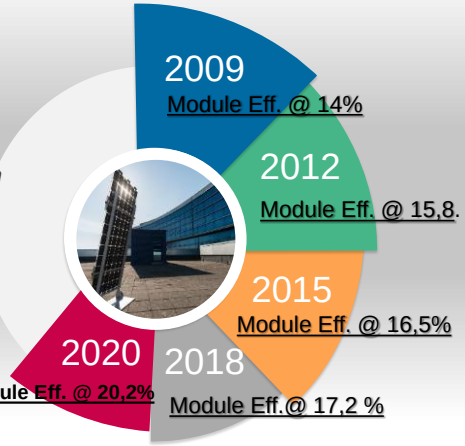
Main features:

- *New materials (more robust and lighter).*
- *New types of towers.*
- *Better aerodynamics system.*
- *Improvements in mechanical components and reduction of the failure rate.*
- *Generators improvements and power electronics.*

Solar PV

poly-cristalline / thin-film low efficiency module (2010)

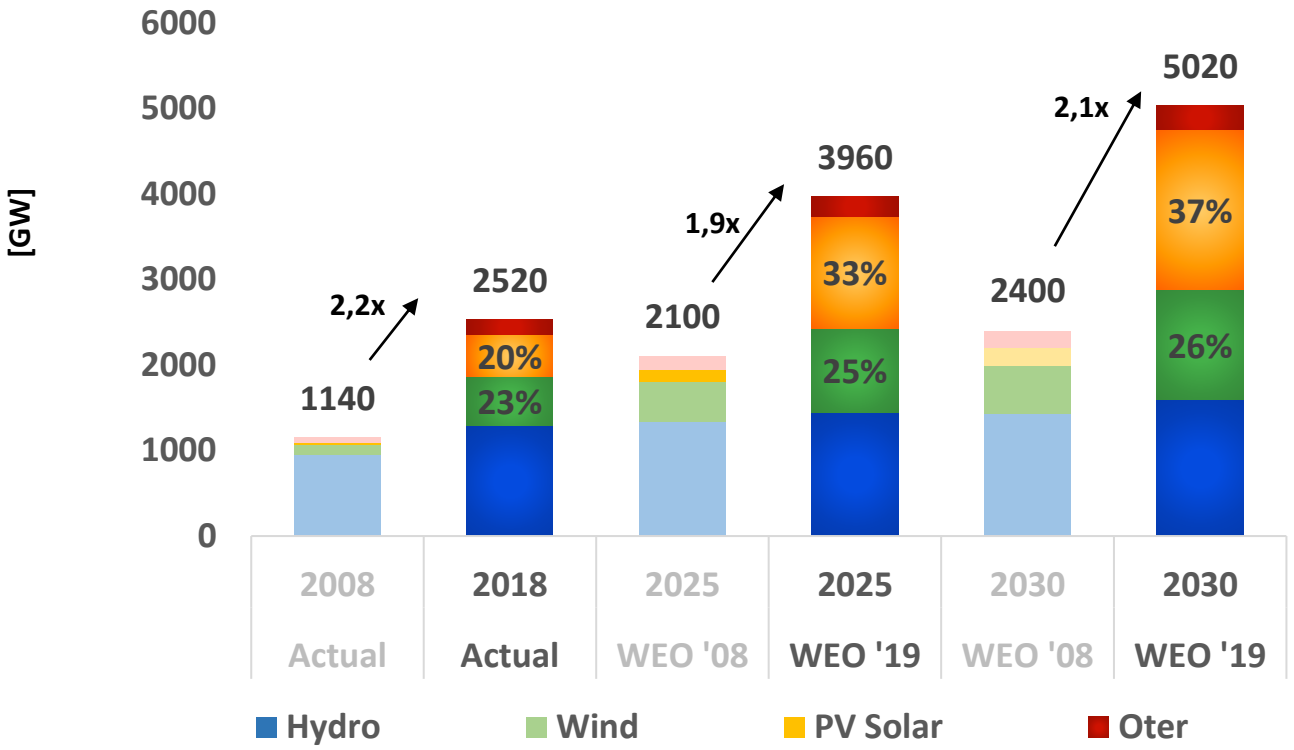
Bifacial HJT Module (2019)



Main features:

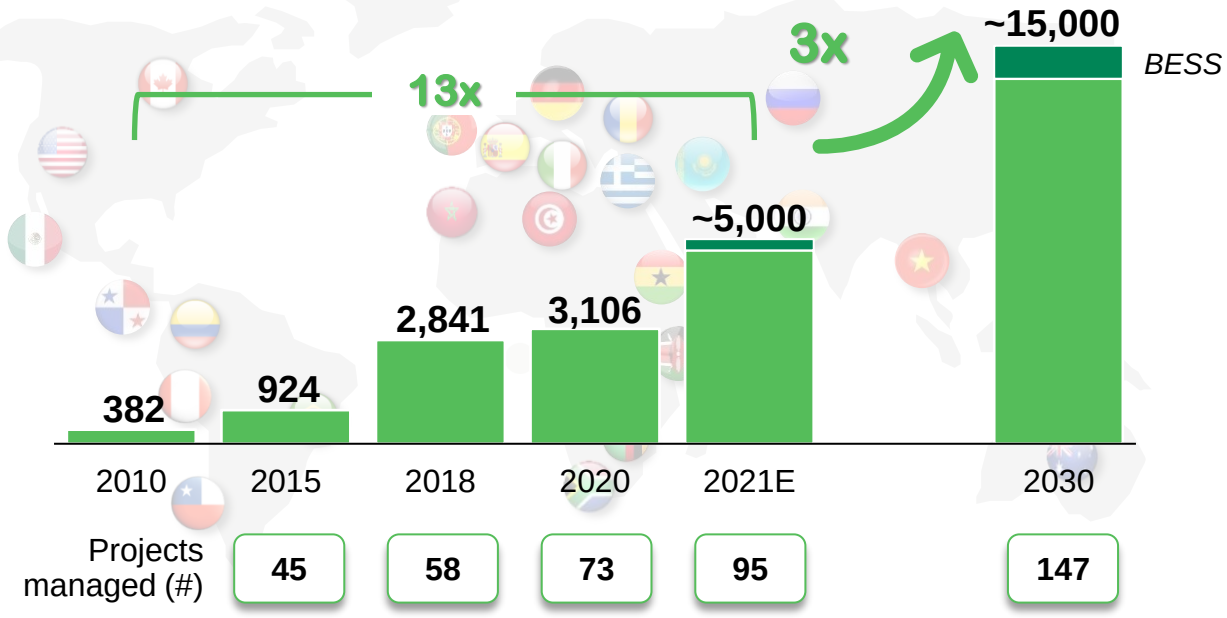
- *Increase share of high efficiency cells (PERC/PERT, HJT, IBC)*
- *Increase energy production (bifacial solution, tracking system)*
- *Costs reduction (Efficiently decreases processing cost, wafer cost reduction)*
- *Reliability in any climate condition (desert area, wet climate)*
- *Longer Lifetime*

Renewables growth: a step ahead of the outlook



Renewables Super Major

Additional built capacity evolution[1] (MW)



Progressive acceleration of our renewables growth over time

1. It includes managed capacity

2020-2030: Decade of Electrification

We could even consider this as the decade of electrification

"we will see electricity taking on a leading role, even in sectors where it had never previously been present"

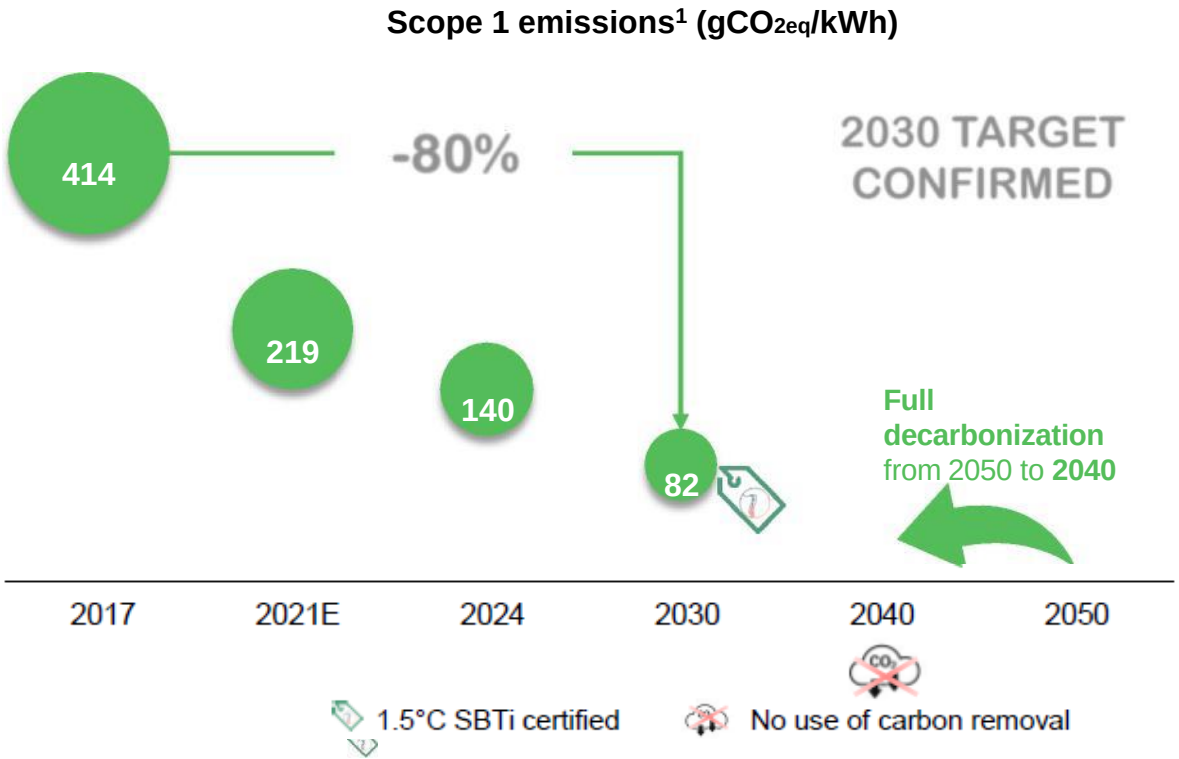
Francesco Starace, CEO of the Enel Group

CAPITAL MARKETS DAY
November 24th 2021

Source: www.enel.com/company/stories/articles/2021/12/decade-electrification


We are
bringing forward
our Net Zero target
by accelerating
customer electrification,
maximizing value and
addressing climate
change challenges
NET ZERO
@2040

Path towards full decarbonization by 2040



Accelerating the decomissioning of the thermal fleet to achieve full decarbonization

1. It includes all scope1 emissions

The strategic milestones to become Net Zero across Scopes (1, 2 and 3) by 2040

Deploy new RES capacity to have a 100% RES fleet by 2040

Exit from coal by 2027

Exit from gas by 2040

Exit gas retail by 2040

100% sales from RES by 2040

Enel capex plan fully aligned with 2040 Net Zero targets

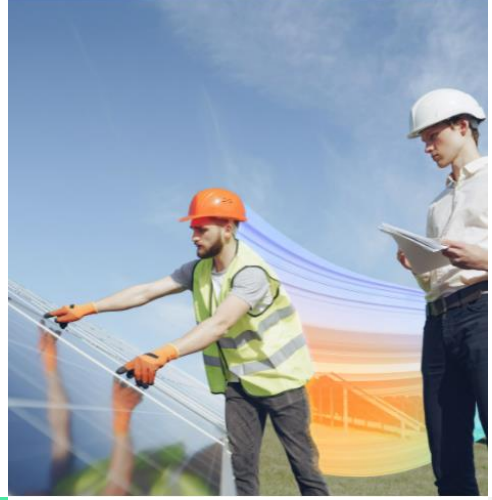
	2021E	2030	2040
RES capacity on total	~58%	>80%	~100%

	2021E	2030	2040
Gas sold (bsmc)	9.8	~6	0


FAIR ENERGY TRANSITION
Can we do it all alone?

The Global Alliance for Sustainable Energy, a global independent alliance, can be a useful platform to speak with one voice and provide support for the entire sector.

The Alliance objectives



Holistic approach

impacting on technical, environmental and social topic

New Standards, KPIs and metrics

definition for new design, business models, and End of Life in line with UN SDGs

Sustainability targets

on 4 main dimensions, according to ESG criteria, leveraging on circular economy

Disseminate and activate

collaboration frameworks

The Alliance Members

Vision, Mission, Values

Vision

The Global Alliance for Sustainable Energy was created to drive progress towards the **full sustainability of the renewable energy industry**.

Renewable energy sources are already the **cleanest and most sustainable solutions** available for power generation and, through the alliance, members commit to upholding innovation and sustainability as guiding principles.

By promoting sustainability across the entire value chain, the alliance will work to improve **transparency, accountability, inclusivity, resource efficiency and responsibility** throughout the renewable energy industry's operations and supply chain.

Our goal is a **just transition to net-zero** and socially responsible energy production, achieving the ambition of The Paris Agreement to avoid the harshest impacts of climate change on people and the Planet.

We will focus our initial efforts on four key themes: **net-zero & CO^2 footprint; circular design & international guidelines; human rights; and water footprint.**

Values

Mission

The Global Alliance for Sustainable Energy is committed to the widespread adoption **of best practices and the definition of sustainability standards** across the renewable energy value chain, through **education and partnerships.**

As a global alliance, we seek to **redefine the meaning of 'sustainable energy' by working together** with civil society, end users, policymakers, academic institutions, materials suppliers, Original Equipment Manufacturers and likeminded utilities to interface with governments and investors.

We aim to align the global renewables sector with the ultimate goal of becoming a truly sustainable industry, defining **concrete steps** now in order to achieve **net zero by 2050**.

Priorities

Net zero/ Decarbonization

Circular design Criteria and adoption of International Standards (e.g. LCA, EPD)

Human Rights and Inclusion promotion

Water footprint

Global Alliance for
Sustainable Energy

Guest speaker #2

Andre Ramalho

Water Resilience Coalition Coordinator

United Nations Global Compact / The Pacific Institute

If climate change is a shark, water is its teeth

The most immediate impacts of the climate crisis will largely be felt through water, especially drought and flooding.

What is the water resilience coalition?

- A CEO-driven **UN Global Compact leadership coalition** to tackle water resilience and climate adaptation
- Launched in 2021
- Members commit to:
  - Ambitious **2030 & 2050 goals**
  - Take **collective action**
  - **Advocate** for action globally
- A proud partner of the UNFCCC Race to Resilience

UN GLOBAL COMPACT | WATER RESILIENCE COALITION

RACE TO RESILIENCE

THE WRC TODAY - 30 MEMBER COMPANIES + 17 PARTNERS

MEMBERS

PARTNERS

CEO WATER MANDATE | WATER RESILIENCE COALITION

The WRC's 2030 Ambition

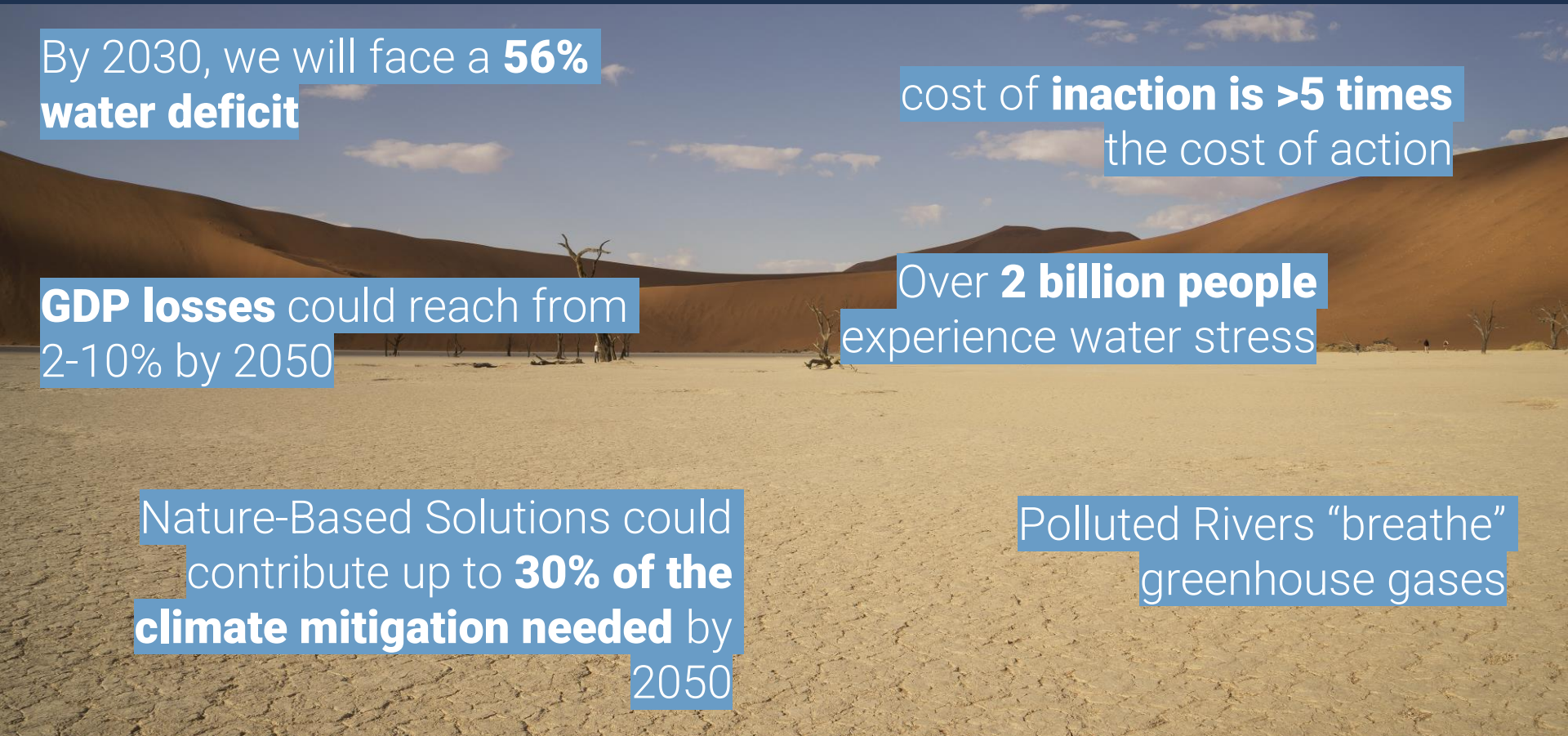
By 2030, we will have positive water impact in over 100 water stressed basins that support **over 3 billion people**

By 2030, we will enable equitable and resilient access and sanitation for at least **300 million people**

150 COMPANIES have the potential to **INFLUENCE 1/3 OF GLOBAL WATER USE**

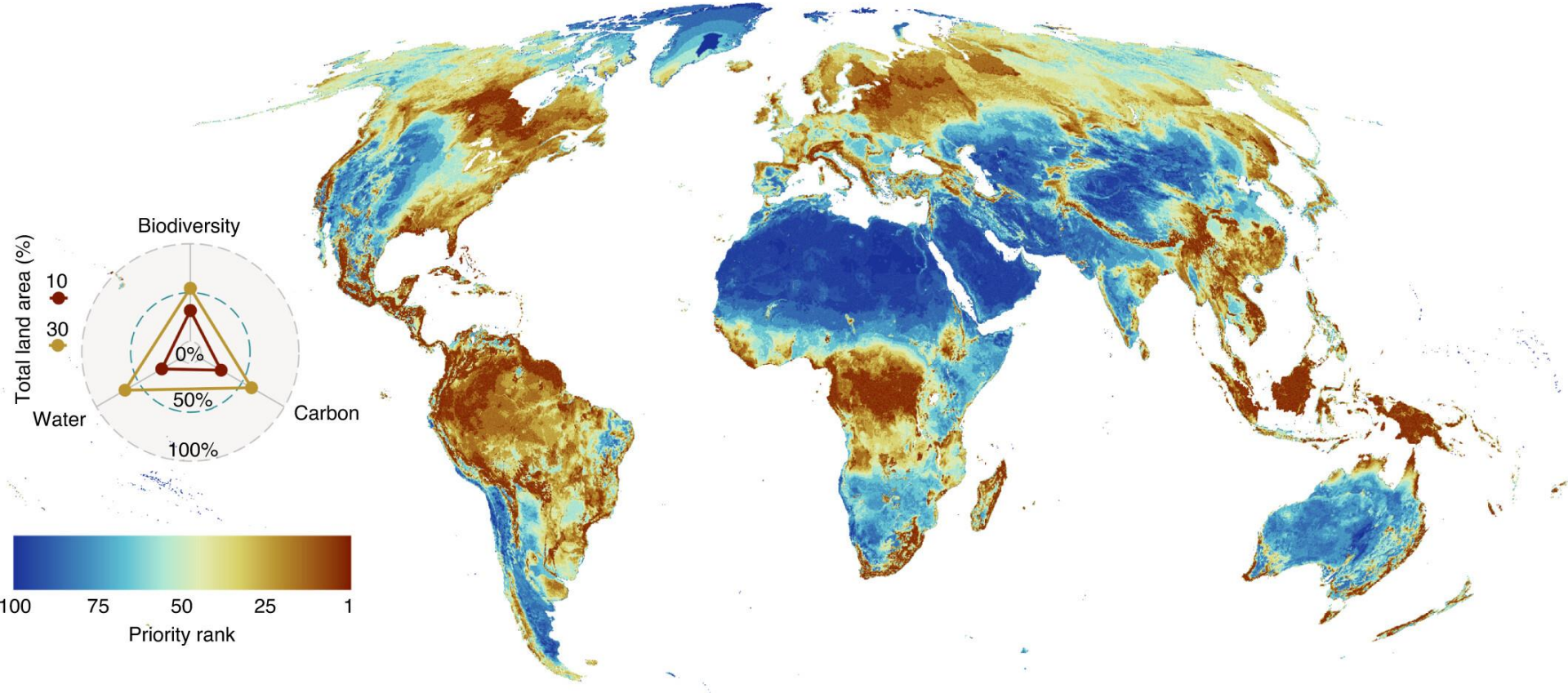
IN 2022 - 17 COLLECTIVE ACTION PROJECTS IN 15 PRIORITY BASINS

The Water Crisis is Worsening... but Solutions Exist



EXPANDING TO 100 BASINS

NATURE ARTICLE – PRIORITY AREAS FOR WATER + BIODIVERSITY + CARBON



Requirements and Eligibility

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Requirements

- Select and address at least two relevant GHG generating sectors.
- Expected to have already well established relations with the proposed sectors.
- Expertise in space sector to evaluate capability of current and planned SatCom, SatEO and SatNav.

Authorisation from National Delegation

Companies residing in the following Member States will be eligible to apply:
Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Italy, Lithuania, Luxembourg, Norway, Poland, Portugal, Romania, Spain, Sweden, Switzerland, and the United Kingdom.

Letter of Authorization from bidding team's national delegation(s) is needed and must be submitted as part of the Bidder's Full Proposal. Without this letter, the proposal is not eligible.

The contacts of the National Delegations can be found at
https://business.esa.int/national-delegation

How to Apply (1/2)

Register	Register by completing online questionnaire on ESA-STAR Registration (minimum 'light registration') (Doing Business with ESA)
Download	Download the official tender documentation (Invitation to Tender) via ESA Star Publication from 13th May 2022
Create	Create 'Bidder Restricted Area' in ESA-STAR Tendering.
Write	Write your proposal and obtain Letter of Authorization from National Delegation.
Submit	Submit your proposal via 'Bidder Restricted Area' in ESA-STAR Tendering (Doing Business with ESA) by the relevant closing date (don't wait until the last minute!)

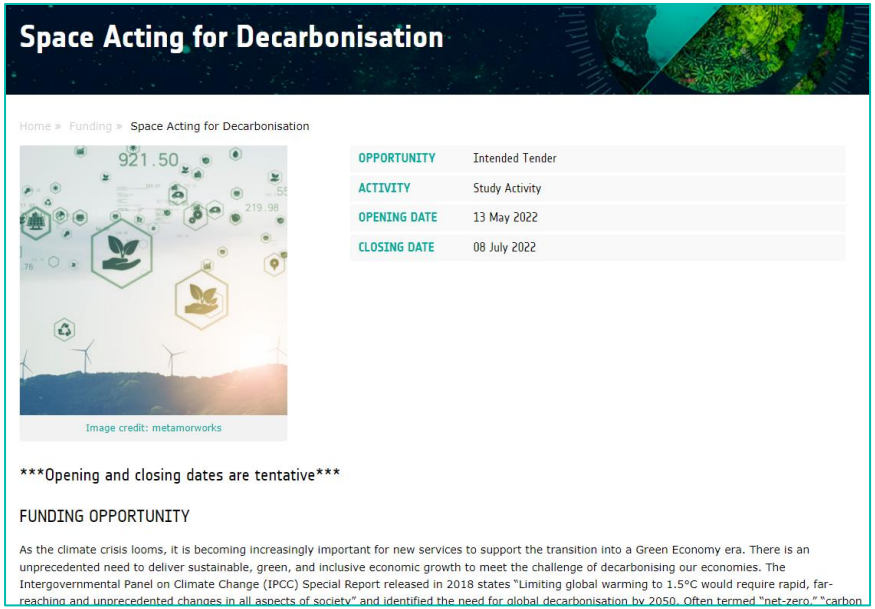
How to Apply (2/2)

The Letter of Invitation to Call for Proposals is issued on ESA-Star Publication (Doing Business with ESA) and includes:

Cover Letter	
Appendix 1	Activity Description / Statement of Work
Appendix 2	Draft Contract
Appendix 3	Tendering Conditions for Express Procurement Procedure - EXPRO/TC
Appendix 4	Proposal Template

Space Acting for Decarbonisation (SA4D): Application Deadlines

If you are interested in applying submit a proposal between the opening and closing date



Space Acting for Decarbonisation

Home » Funding » Space Acting for Decarbonisation

Image credit: metamorworks

OPPORTUNITY	Intended Tender
ACTIVITY	Study Activity
OPENING DATE	13 May 2022
CLOSING DATE	08 July 2022

Opening and closing dates are tentative

FUNDING OPPORTUNITY

As the climate crisis looms, it is becoming increasingly important for new services to support the transition into a Green Economy era. There is an unprecedented need to deliver sustainable, green, and inclusive economic growth to meet the challenge of decarbonising our economies. The Intergovernmental Panel on Climate Change (IPCC) Special Report released in 2018 states "Limiting global warming to 1.5°C would require rapid, far-reaching and unprecedented changes in all aspects of society" and identified the need for global decarbonisation by 2050. Often termed "net-zero," "carbon

https://business.esa.int/funding/intended-tender/space-acting-for-decarbonisation

Thank you!

For more information:

ESA Space Solutions
(https://business.esa.int/)

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