Kick Start webinar

Carbon capture, storage & sequestration

Mina Syriou, CGeog

Partner-led & Thematic Initiatives,
Downstream Business Applications

European Space Agency

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Business Applications & Partnerships

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European Space Agency

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Carbon capture, storage & sequestration

Agenda

1. Introduction

2. ESA Space Solutions

3. Kick-Start Programme

4. Carbon capture, storage & sequestration

5. Our guest speaker – Guloren Turan Global CCS Institute
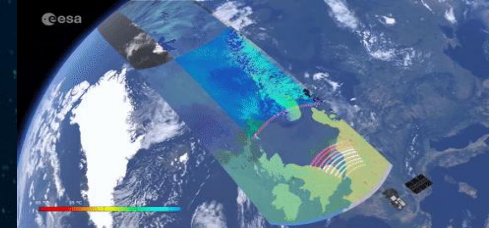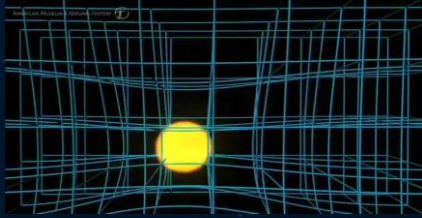
6. How to Apply

7. Q&A

Science and Exploration

Enabling and Support

Safety and Security

Applications

#SpaceDebris2017

#Galileo

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→ 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

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

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A FULLY INTEGRATED TOOLKIT FOR DOWNSTREAM BUSINESSES

Marketing & Local Outreach

Established Space-Using Companies

Newcomer SMEs

Startups

Product/Service Development & Demonstration

Access to Global Customers

Access to Private Finance

ESA BIC & Startup Support

Sustainable Development Goals

Revenue and Exports

Job Creation

Grow Europe's Downstream ecosystem

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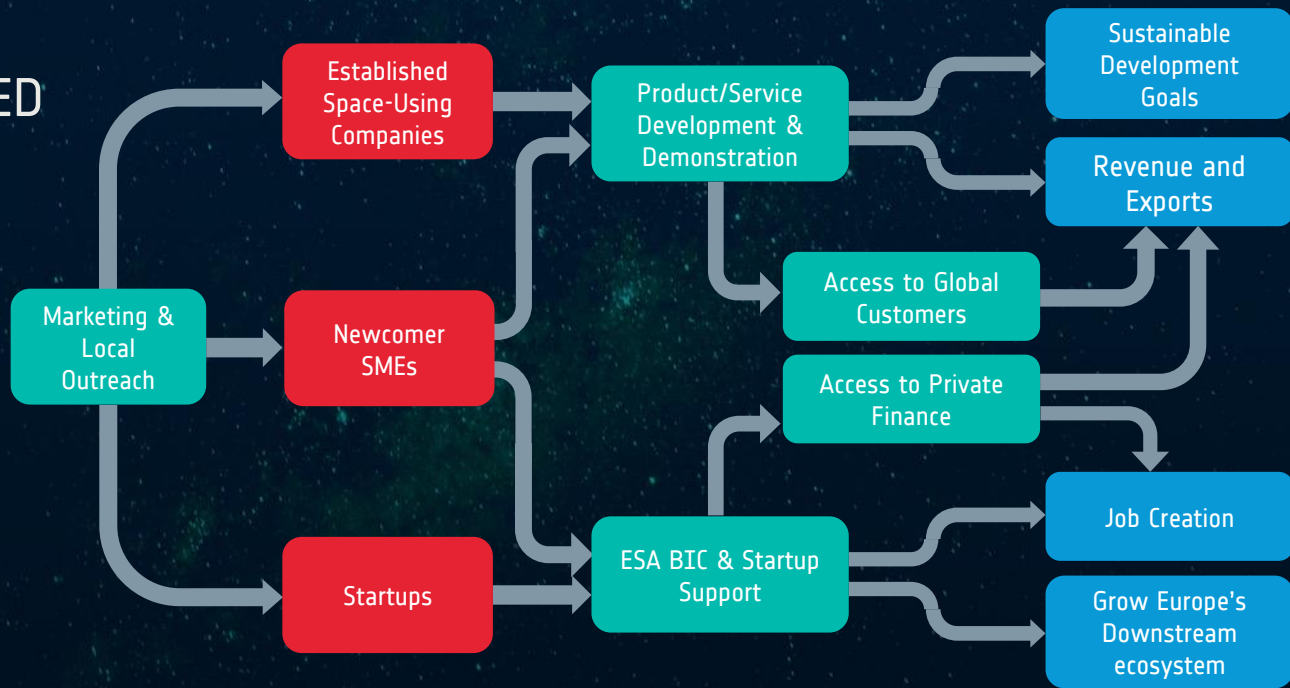
→ ESA BUSINESS APPLICATIONS

Zero-equity co-funding up to €2M

- Demo projects: 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

- Kick-Starts: Thematic activities
  - Up to 75% co-funding

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

The Kick-Start programme

→ Kick-Start: Background

6 months duration - Overall cost **€80K** | **€60K ESA funding** (75% ESA co-funding)

"Kick-Start Activities" are ESA's funding scheme enabling companies to undertake short Feasibility Studies that explore new service and application concepts making use of space capabilities

- **Limited initial investment** by companies, particularly attractive for SMEs and start-ups, granting them an easy entry into ESA Business Applications

- **Semi-competitive tendering** procedure

- **Rapid evaluation** process, to allow companies to keep the pace in the market

- If successful, possible follow-up support via Demonstration Projects

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→ Kick-Start: Goals

Kick-Starts looks at 3 main elements:

1. Engagement with potential end users and customers to understand their needs and translate these into service requirements.

2. Evaluation of the technical feasibility of the service, and definition of the service and system architecture.

3. Evaluation of the economic viability of the service and development of a business plan.

ᶜesa
space solutions

Carbon capture, storage, and sequestration

Home » Funding » Carbon capture, storage, and sequestration

OPPORTUNITY	Intended Tender
ACTIVITY	Kick-start Activity
OPENING DATE	08 February 2022
CLOSING DATE	26 March 2022

https://business.esa.int/funding/intended-tender/carbon-capture-storage-and-sequestration

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Topics

- **Technological carbon capture and storage** - support identification of suitable and safe geographical sites for deployment, monitor environmental, industrial, and geological risks related to carbon transport and storage

- **Biological carbon removal and sequestration** – support measurement/ computation and monitoring of total net carbon balance, support monitoring o afforestation/ reforestation/ restauration actions, support identification of sites for afforestation, reforestation & restauration actions, support monitoring of farming sequestration actions, support efficient afforestation/reforestation/ restauration actions.

Satellite Communication (SatCom) - offers reliable connectivity to remote areas with limited terrestrial connectivity, where especially most carbon storage sites, and reforestation/ land restauration actions will be located

Satellite Earth Observation (SatEO) - useful for identification of the best geographical sites for establishing new afforestation/reforestation/restoration sites, monitor ongoing sequestration actions and support the evaluation of sequestrated carbon volume

Global Navigation Satellite Systems (GNSS) - useful for locating and geo-referencing new sites of deployment, supporting local teams in the implementation of the planned afforestation/ reforestation/ restoration actions

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Our guest speaker

Guloren Turan

General Manager - Advocacy &
Communications, Global CCS Institute

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GLOBAL STATUS OF
CCS 2021

CCS ACCELERATING TO NET ZERO

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WHAT IS CCS?

"CCS is a set of technologies that captures CO2 from large emission sources or from the atmosphere and safely stores them underground."

Uses of this versatile technology include:

- **Emissions abatement**
  - Power generation (natural gas and coal)
  - Industrial emissions (gas processing, cement, steel, waste incineration)
- **Carbon dioxide removal**
  - Direct air capture
  - Bio-energy with CCS
- **Enabler of a new hydrogen energy economy**
  - Steam methane reforming of natural gas with CCS
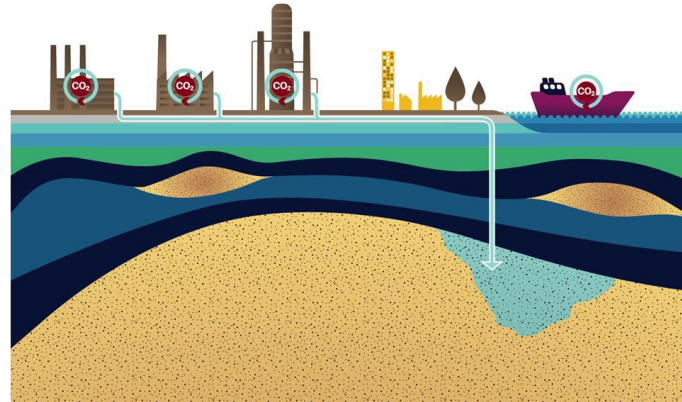
IPCC: 1.5°C – CCS IS ESSENTIAL

Radical Change

2055 Target year to reach net-zero emissions

Net carbon emissions

Agriculture, forestry and other land use

2020   60   2100

Business, technology and society as a whole change, dramatically reducing demand for energy. Apart from changed land use and reforestation, no carbon removal is needed.

Improved Sustainabilty

Fossil fuels and industry

2020   60   2100

A worldwide focus on sustainability keeps energy demand stable. Renewable energy largely replaces fossil fuels. **Carbon capture and storage** compensates for the remaining emissions.

Managed Transition

Bioenergy with carbon capture and storage

2020   60   2100

Energy demand rises at a moderate pace, in line with historical trends. More renewable energy production and the intensive use of **carbon capture and storage** keep emissions in check.

High Growth

2020   60   2100

Rapid economic growth drives global energy demands even higher, keeping emissions up. Technological fixes and zealous use of **carbon capture and storage** ultimately claw back carbon emissions.

Source: IPCC and The Economist
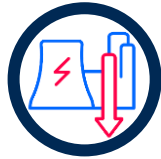
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WHY DO WE NEED CCS?

 Achieving deep decarbonisation in hard-to-abate industry.

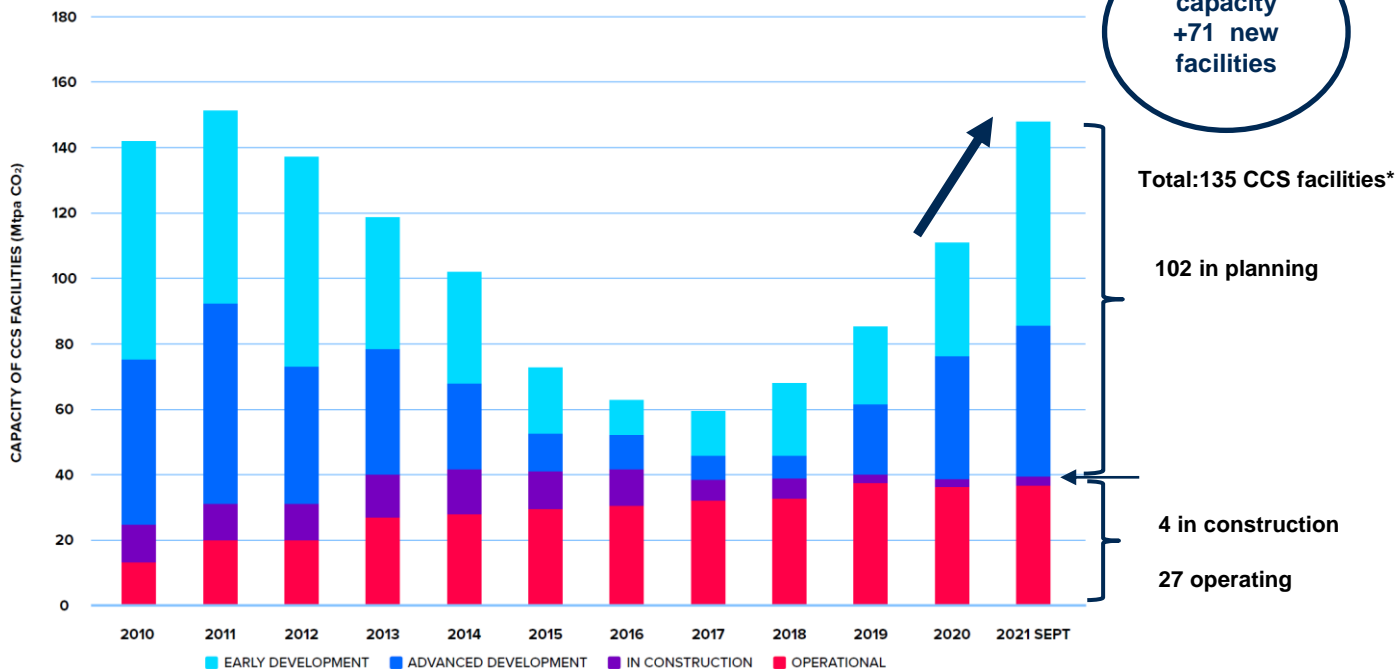 Enabling the production of low-carbon hydrogen at scale.

 Providing low carbon dispatchable power.

 Delivering negative emissions.

THE GLOBAL STATUS OF CCS IN 2021

- Four years of growth in the CCS project pipeline.

+32% capacity
+71 new facilities

Total:135 CCS facilities*

102 in planning

4 in construction

27 operating

CAPACITY OF CCS FACILITIES (Mtpa CO₂)

2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 SEPT

EARLY DEVELOPMENT   ADVANCED DEVELOPMENT   IN CONSTRUCTION   OPERATIONAL

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71 NEW FACILITIES ADDED IN 2021

- 41 new commercial facilities added in North America (31 of these part of the Summit Network), 35 in Europe and 5 across the rest of the world.

- First commercial facilities in Belgium, Denmark, Hungary, Indonesia, Italy, Malaysia and Sweden.

- First CCS applications in LNG liquefaction, first commercial DACCS project in Europe. First commercial cement CCS facility under construction. Several power CCS projects around the world.

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DRIVERS OF CCS MOMENTUM IN 2021

BLUE HYDROGEN PROJECTS

RISE OF CCS NETWORKS

NET ZERO COMMITMENTS FROM COUNTRIES AND COMPANIES

EMERGENCE OF STRATEGIC BUSINESS PARTNERSHIIPS

TECHNOLOGY-BASED CARBON REMOVAL

CCS FACILITIES AROUND THE WORLD

	0PERATING	IN DEVELOPMENT	SUSPENDED	TOTAL
North America	16	60	2	78
China	3	3	-	6
Europe	3	35	-	38
Gulf Cooperation Council	3	1	-	4
Rest of World*	2	7	-	9
Total	**27**	**106**	**2**	**135**

*Includes facilities in Australia, Brazil, Indonesia, Malaysia, New Zealand and South Korean

INCREASING DIVERSITY OF CCS APPLICATIONS

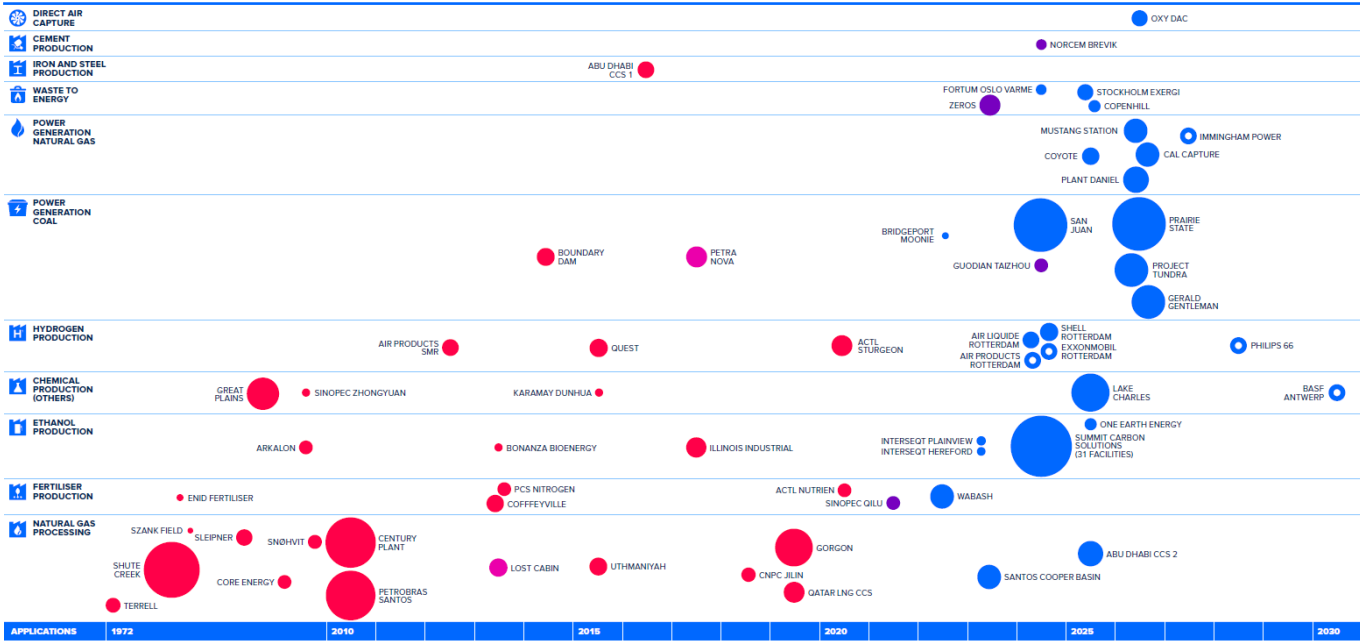Chart indicates the primary industry type of each facility among various options.

● IN OPERATION
● OPERATION SUSPENDED
● IN CONSTRUCTION
● ADVANCED DEVELOPMENT
○ CAPTURE CAPACITY TBC

Size of the circle is proportionate to the capture capacity of the facility.

● 0.2　● 1.0　● 5.0 Mtpa OF CO₂

CCS: VITAL TO NET-ZERO

- Despite progress in 2021, to achieve net zero emissions, CCS capacity must increase by <u>100-fold</u> by 2050.

- Between US$655 - $1,280 billion in capital investment is needed in the next three decades.

- Stronger policy to incentivize rapid CCS investment is overdue.

STRONG POLICY ACTION NEEDED

Define the role of CCS in meeting national emissions reduction targets and communicate this to industry and the public

Create a long-term, high value on the storage of CO_2.

Support the identification and appraisal of geological storage resources.

Develop specific ccs laws and regulations that include the transfer of liability to the government subject to acceptable performance and behaviour of the stored CO_2.

Ensure emissions abatement policies are inclusive of all options (including CCS) to enable an optimum mix of technologies to maximise abatement and minimise cost.

Identify opportunities for CCS hubs and facilitate their establishment.

Provide capital grants, low-cost finance and/or guarantees to reduce the cost of capital for CCS investments.

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THANK YOU

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globalccsinstitute.com/resources

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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 'AO 11088' from 10th December 2021
Create	Create 'Bidder Restricted Area' in ESA-STAR Tendering
Write	Write your proposal and obtain Letter of Authorization from National Delegation, if needed.
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**) under 'AO 11088' 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

→ **Authorisation from National Delegations**

- The authorization from National Delegation for the specific Thematic Call against which you submit your Proposal is an admissibility criterion. Proposals not authorized at the closing date of the Thematic Call will not be admitted for evaluation

- For each individual Thematic Call, dedicated clarifications will be posted in ESA-Star Publication to provide information on the list of Member States that have already provided their pre-authorization to the Thematic Call

- In case your company/organisation resides in a country which has not provided a pre-authorization to the Thematic Call you are interested in, you need to contact your National Delegation. The contact information of the National Delegations can be found at https://business.esa.int/national-delegations

→ Proposal template

Your Proposal shall include the following information:

1. Executive Summary (max 1 page)
2. Business Potential (max 5 pages)
3. Technical Concept (max 5 pages)
4. Team and Resources (max 3 pages)
5. Management (max 4 pages)
6. Financials (max 2 pages)

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Thank you!

For more information visit ➔

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