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The Recycling Times



HADCO Group's Recycling Division Monthly E-Newsletter



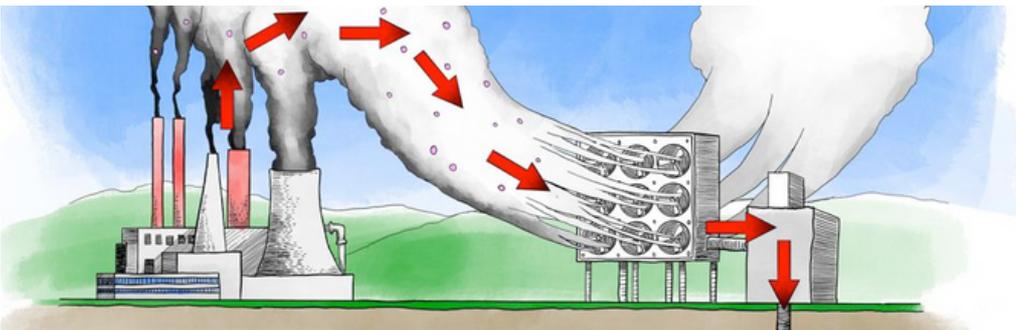
Image Credit: International Energy Agency

Combating Climate Change Through Carbon Capture

The need to reduce carbon emissions continues to be a critical driver in climate change discussions. According to the [Centre for Climate and Energy Solutions](#), Carbon Capture and Storage (CCS) technologies can “capture more than 90% of carbon dioxide emissions from power plants and industrial facilities.”

- CCS can reduce global greenhouse gas emissions by 14% by 2050.
- CCS is a practical way to achieve “decarbonization in the industrial sector.”

Carbon Capture and Storage (CCS), also referred to as Carbon Capture and Sequestration, consists of two (2) categories - Biological Sequestration Processes and Physical Sequestration Processes.



"IN THE CARIBBEAN, WE ARE ALREADY EXPERIENCING THE EFFECTS OF CLIMATE CHANGE, WHICH IS A THREAT TO OUR COMMUNITIES, ECONOMIES, SECURITY, HEALTH, AND OUR CHILDREN'S FUTURE. WE STRIVE TO DO OUR PART IN EDUCATING OUR COMMUNITY ON THESE MATTERS."

Kevin Whiteman -
Managing Director,
Recycling Division,
HADCO Group

Illustration of Carbon Capture technology and how it can filter and remove greenhouse gases.
Source: [Forbes](#)

Types of Carbon Capture and Storage

- Biological Sequestration refers to the natural ability of ecosystems like forests, trees, and wetlands, to store carbon. This process occurs without human intervention. However, as fossil fuel consumption increases and deforestation rates rise, carbon dioxide mitigation measures need to be implemented with greater urgency to reduce global warming.
- Physical Sequestration processes involve human intervention to capture carbon dioxide, and transport the gas by pipeline to be stored deep underground; in geological formations, or the ocean seabed.

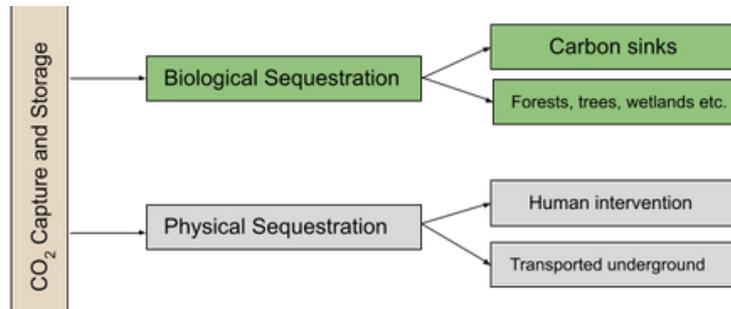


Diagram summarising the main differences between Biological and Physical Sequestration

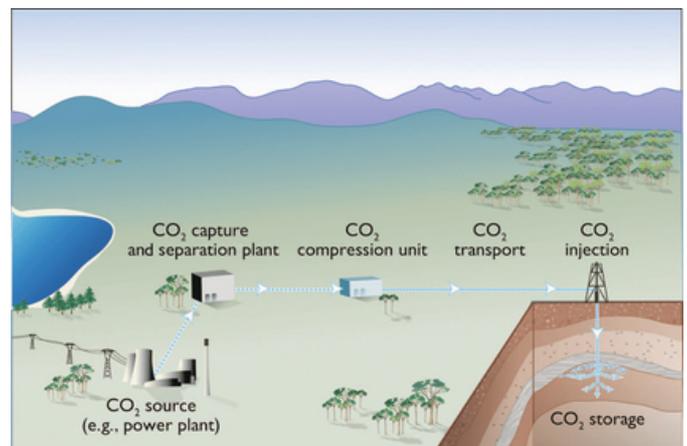
Physical Sequestration Processes

The theory behind CCS in the industrial sector is based on storing carbon dioxide underground to reduce emissions into the atmosphere. The captured carbon dioxide can then be used productively as feedstock to manufacture fuels, building materials, and more.

What Does a CCS System Involve?

A typical CCS system involves the following:

- 1. Separation:** The separation of the CO₂ from other gases produced at large industrial process facilities such as coal and natural-gas-fired power plants, steel mills, cement plants and refineries.
- 2. Compression:** The compression of the CO₂ to be transported via pipelines, trucks, ships, or other methods to a suitable site for geological storage.
- 3. Injection:** The injection of CO₂ gas into deep underground rock formations, usually at depths of one kilometre or more.



Flowchart of the Carbon Capture and Storage (CCS) process

Source: [ResearchGate.net](https://www.researchgate.net)

What Countries Are Leading in CCS?

A [2018 study](#) done by the Global CCS Institute, listed Australia, Canada, Norway, the UK and the US as the world's leading CCS countries with China, Denmark, Germany, Japan, the Netherlands and Iceland close behind.

The study also called for more forward-thinking governmental policies that encourage CCS initiatives. It is imperative for oil and gas-producing nations to offset their carbon footprint through these initiatives.

In the Caribbean, we are already experiencing the effects of climate change, which is a threat to our communities, economies, security, health, and our children's future. In fact, last year at COP26 (the United Nations' Climate Change Conference), the Government of Trinidad and Tobago pledged to explore the use of CCS, as one of the ways the nation could reduce its carbon emissions. (Read more on Prime Minister Rowley's statement [here](#)).

The Leaders in CCS:

- Australia
- Canada
- Norway
- United Kingdom
- United States
- China
- Denmark
- Germany
- Japan
- Netherlands
- Iceland



Dr. Keith Rowley during his COP26 address

" IT IS IMPERATIVE FOR OIL AND GAS-PRODUCING NATIONS TO OFFSET THEIR CARBON FOOTPRINT THROUGH CARBON CAPTURE AND STORAGE INITIATIVES."

Marguerite Simon-Williams -
Operations Manager,
Ecoimpact Co. Limited

How Can We Take Action?

Whilst CCS initiatives are being explored in Trinidad and Tobago, we must stay informed and be a part of the wider discussion on sustainability. We can take action to limit our personal carbon emissions as follows:

1. Invest in energy-efficient appliances
2. Purchase energy-efficient LED bulbs
3. Buy electric vehicles
4. Reduce, reuse, and recycle

CCS Pros and Cons

Pros:

- Reduces carbon emissions and other pollutants simultaneously.
- CO₂ stored can be used to make other chemicals, products, and fuels (e.g., polyurethanes, which are used to create foam products like sponges, mattresses etc.)
- CO₂ can be injected into concrete to improve its durability.
- Industrial CCS operations create employment for skilled technicians.

Cons:

- The cost of CCS equipment is high.
- Long-term storage capacity for CO₂ is uncertain, as studies are still being conducted on the long-term effects of underground storage.
- CO₂ transport and storage sites may be dangerous with the potential of leakage, posing a threat to human life.
- Due to health risks, the public's apprehension about placing CO₂ near/around urban and built-up areas is justifiably warranted.



Get Involved!

We thank you for taking the time to learn with us!

Organisations and individuals who are interested in responsibly disposing of waste materials listed below can schedule a free collection with us! Collections are also done in Tobago.

For wastepaper, cardboard, Tetra Pak, and aluminium cans, please contact:
New Age Recycling: (868) 290-2970 / 2975 or visit www.newagerecyclingtt.com

For waste vegetable oil and used lead-acid batteries, please contact:
Ecoimpact Company Limited: (868) 633-3609 or visit www.ecoimpacttt.com

For more information visit us at www.hadcoltd.com/divisions/recycling/



Photo: The world's largest Carbon Capture and Storage plant, the Orca Plant, located in Iceland

**"THANK YOU FOR
TAKING THE TIME TO
LEARN WITH US! WHILST
CCS INITIATIVES ARE
BEING EXPLORED IN
TRINIDAD AND TOBAGO,
WE MUST STAY
INFORMED AND BE A
PART OF THE WIDER
DISCUSSION ON
SUSTAINABILITY."**

Ronaldo Pierre -
Business Development Officer,
New Age Recycling Limited