



BIOENERGY, GEOLOGICAL CARBON STORAGE AND WATER RESOURCES



**A contribution
towards carbon neutrality?**

**BEST
PRACTICES**

**LIMITATIONS,
CHALLENGES
AND RISKS**

IMPLEMENTATION



french
water
partnership



partenariat
français
pour l'eau

BECCS (Bioenergy with Carbon Capture and Storage) is the production of bioenergy from biomass, with a system designed to capture and store CO₂ in geological formations.

ACHIEVING CLIMATE TARGETS



1,5°C

This is the target to limit global warming set by the Paris Agreement in 2016.



Carbon neutrality

This is the target France set to achieve by 2050 according to the National Low Carbon Strategy (SNBC).

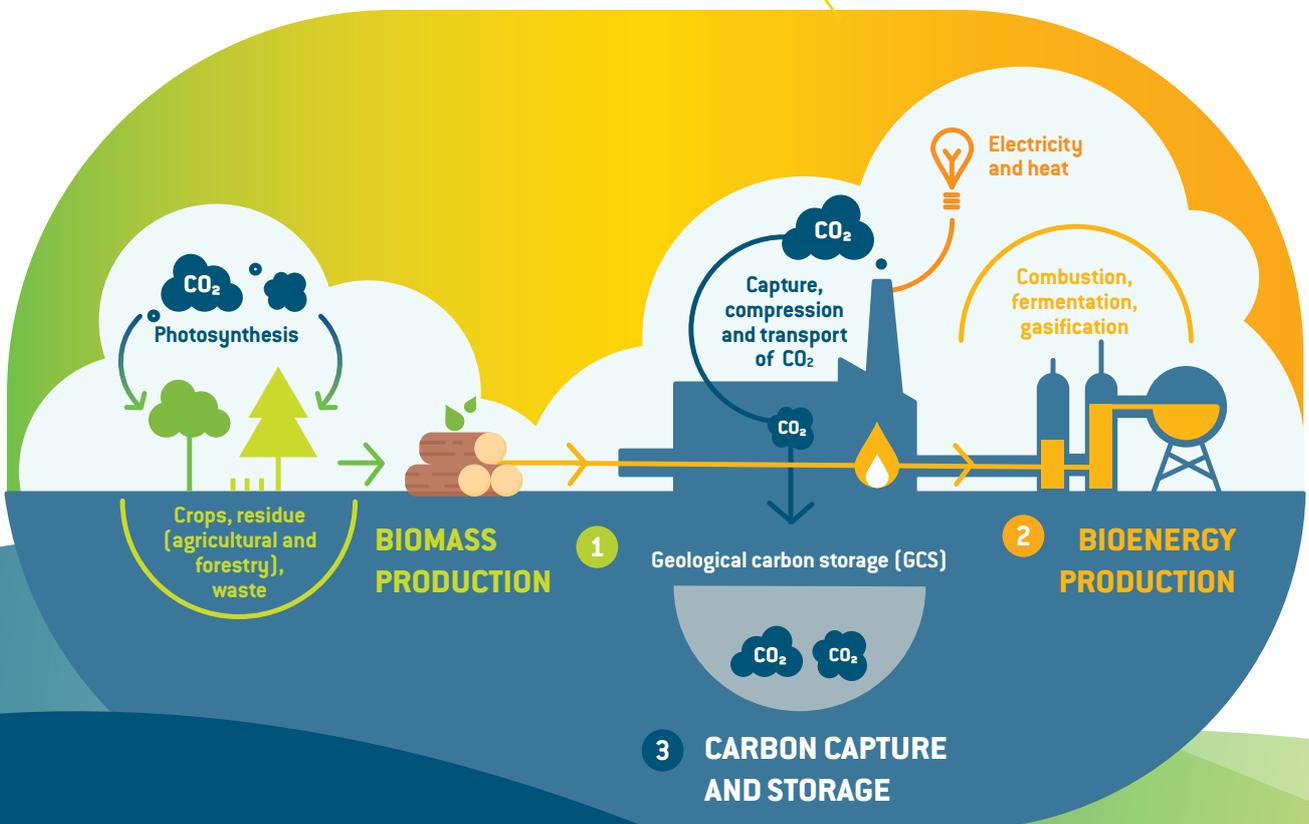
Reducing greenhouse gas emissions and making adjustments in the sectors in question will not be enough to limit global warming.

BECCS helps enhance negative emissions

In its 2018 report, the IPCC (Intergovernmental Panel on Climate Change) had already identified **new technological options**, including BECCS, to enhance negative carbon emissions, in order to further reduce greenhouse gas emissions.

BECCS consists of 3 stages

- 1 BIOMASS PRODUCTION
- 2 BIOENERGY PRODUCTION
- 3 CARBON CAPTURE AND STORAGE (CCS) OF THE CO₂ GENERATED



Carbon emissions from [CCS] biomass burning are not released into the atmosphere but captured and stored in deep geological layers.

FOCUS

BECCS CHALLENGES & PERSPECTIVES

At technological readiness level, BECCS still needs to address substantial economic, social and environmental challenges before it can be deployed on a larger scale.



BECCS today

5 ACTIVE POWER PLANTS

The 5 power plants identified in the world capture the equivalent of 1.5 metric tons of CO₂ per year.



FRENCH EXPERTISE

While there are no industrial-scale projects in France, **French players are conducting** bioenergy and carbon capture/storage **projects** around the world.

3 key challenges to meet to make BECCS viable

ECONOMIC CHALLENGES

The current high cost of BECCS is primarily linked to CO₂ capture.

SOCIETAL CHALLENGES

Onshore storage faces strong local opposition.

ENVIRONMENTAL CHALLENGES

What would be the ratio of storage soil to agricultural soil?

What about potential misuse?

BECCS and water resources

The development of BECCS can have a negative impact on surface and groundwater resources and exert additional pressure on them locally. Without calling BECCS into question, this drawback calls for small-scale development, on a case-by-case basis, depending on the water resources available in each region.



A GUIDE FOR ELECTED OFFICIALS AND LOCAL AUTHORITIES

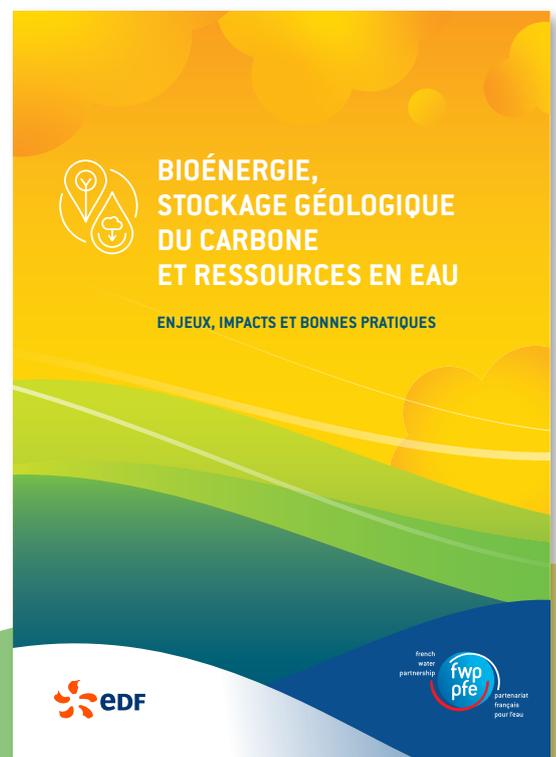
This document raises the question of the economic, social and environmental viability of BECCS and its potential impacts on water resources.

>>> **Detailed presentation of BECCS and other negative emission processes, limits and risks of the solutions...**With the help of diagrams and terminology, this guide helps to map out the road to carbon neutrality and provides an overview of French expertise on the subject.

This document is also an opportunity to present examples of concrete solutions implemented in France and around the world:

In Côte d'Ivoire, the Biovéa biomass power plant is able to meet the electricity needs of 1.7 million people; in Norway, the Northern Lights CCS project will be able to process and store up to 1.5 metric tons of CO₂ per year; in Loire-Atlantique, France, the Métha Treil project can produce 2 million m³ of biogas per year.

SCANNER ET TÉLÉCHARGER LE GUIDE



Graphic design: Anne-Charlotte de Lavergne / Texts in French: Mathieu Renault

The French Water Partnership (FWP) is **exploring scopes of action to limit the effects of climate change on water resources**, while reducing potential major hydro-ecological impacts.

In this context, the FWP ensures studies are conducted on the risks posed by BECCS in terms of water consumption (resource depletion) and contamination of surface or groundwater; but also the potential impact of BECCS on biodiversity or ecosystem services provided by nature.



EDF's driving purpose is to build a carbon-neutral energy future that merges efforts to preserve the planet, well-being and development through innovative solutions and services.

A major player in the energy transition market, EDF Group is an integrated energy provider, whose business portfolio covers the full range of energy sectors.

90% GLOBAL PRODUCTION

502 TWH CARBON-FREE ELECTRICITY PRODUCTION



The FWP conveys the message that water and its cycle are among the main markers of climate change and raises awareness on the opportunity for negative emission solutions.

The FWP brings together French public, private and associative players operating in the water sector.

+ 200 MEMBERS

Join the **"State and public institutions"** or **"Elected officials and local authorities"** colleges.

<https://www.partenariat-francais-eau.fr/en/members/>

