

A BIOECONOMY STRATEGY FOR FRANCE

WHAT IS THE BIOECONOMY?

It is the photosynthesis economy, and more generally the living world economy. It encompasses all biomass production and processing activities, whether in forestry, farming or aquaculture, directed at the production of food, feed, biobased products and renewable energy.

That definition covers a wide variety of sectors: agriculture, forestry, processing in the food and wood industries, energy production from biomass, production of materials and molecules and biowaste conversion.



THE GOAL OF THE BIOECONOMY :

- ✓ is to guarantee food security and sustainable living standards for current and future generations by conserving natural resources and the ecosystemic functions of habitats,
- ✓ is to be efficient, resilient, circular and productive over the long term,
- ✓ is to focus on the general public and to be rooted in local regions, contributing to the development of economic value and jobs,
- ✓ is to offer innovative solutions that are effective, affordable and capable of addressing the diversity of human needs.

WHAT HAS BEEN ACCOMPLISHED IN THE BIOECONOMY IN FRANCE?

French industries based around the living world are key actors in the bioeconomy. They are already engaged in innovative approaches, helping new uses to emerge:



The different sectors of agriculture are engaged in the production of renewable energy (methanization and biofuels, for example).



The agrifood industries are using their co-products to produce animal feed, energy, etc.



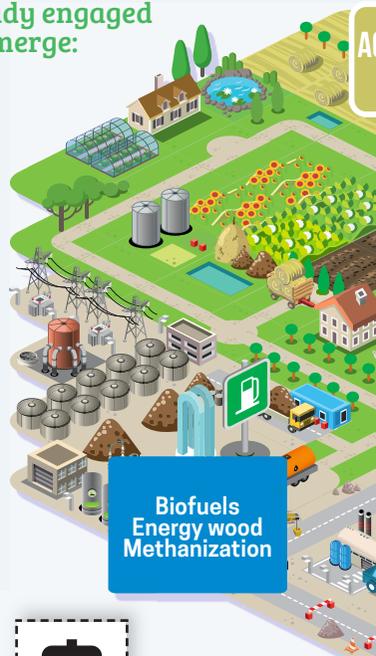
The forestry & wood sector proposes a variety of uses for biomass, ranging from construction timber to energy, and including industrial lumber and innovative molecules.



New materials and molecules are produced from agricultural and forestry biomass



Certain types of biowaste are recycled, notably as an industrial fermentation media, fertilizers or biogas from methanization.



In France, nearly **1.9 million people** are directly involved in bioeconomy activities.
80% of French land is also involved.



THESE CHANGES ARE SUPPORTED BY GOVERNMENT

➔ The bioenergy sector has grown up on a foundation of dedicated economic and fiscal policies.

➔ All actors have been able to benefit from support for innovation. The programme of investment for the future has led since 2010 to allocation of €250m in support of bioeconomy projects.

➔ The energy transition law for green growth has emphasized biobased products, especially for construction and public procurement.

The agroecology project for France opens the way to expanded biomass production using more diversified methods with less environmental impact.

WHY IS THE BIOECONOMY A PROMISING OPPORTUNITY FOR FRANCE?

La France : ► is a country with major farming, forestry and aquaculture resources providing input for a diversified bioeconomy, thereby offering new outlets for these primary sectors, creating value-added and jobs,

► can find in those new outlets solutions to meet its COP21 commitments on reductions in its use of fossil resources and lessen its dependence on imported raw materials,

► can offer innovative and sustainable development solutions for its regions,

► already possesses structured industries, transport infrastructures and industrial facilities hosting or capable of hosting bioeconomy projects.

For these reasons, in 2015 the ministries responsible for ecology, research, industry, agriculture and forestry initiated work to build *a bioeconomy strategy for France.*

The resulting strategy is aimed at strengthening all value chains at the same time.



THEMATIC FOCUSES:

A bioeconomy strategy committee has been set up:

- to translate the strategy into concrete initiatives,
- to contribute to updating European bioeconomy strategy,
- to support regional programmes undertaken to foster the bioeconomy.



1**Ensuring that bioeconomy products become market reality.**

There is a need to make consumers and users more aware of these products. Their quality must be guaranteed through certification and normative standards, and their positive externalities highlighted, especially for the environment. Public procurement can be a valuable tool for their promotion.

2**Supporting a transition to biosourced industry that is effective, innovative and sustainable.**

The value chains in the bioeconomy must strengthen dialogue and synergy between producers and processors of biomass, as well as between the various ways of using biomass, along biorefinery lines. Those value chains must also be flexible and matched to types of biomass production that are increasingly diversified and variable, reflecting production conditions.

3**Sustainable production of the bioresources necessary for the various requirements of value chains and society.**

Increased mobilization and innovations in production systems can help in the production of these bioresources, while remaining focused on the priority of preserving systems of production and the ecosystems in which they operate. Knowledge of the resources is essential if sustainable value chains are to emerge.

4**Guarantees of bioeconomy sustainability.**

Increased use of ecosystemic functionalities for production that is economically and environmentally efficient, the sharing of good practice and the ability to evaluate impacts must guarantee a sustainable bioeconomy.

5**Building dialogue with society for a genuinely shared bioeconomy.**

Through information, awareness-raising and fostering possibilities for discussion, the bioeconomy can become a project for society as a whole.

6**Innovation for a high-performance bioeconomy.**

Research and innovation are essential to the development of the bioeconomy. Some of the applications envisaged in the bioeconomy are innovative and require additional R&D. The production and use of the necessary biomass also require innovative approaches. And lastly, systemic approaches focused on the bioeconomy as a whole and its economic, environmental and social impacts also need to be underpinned by research.

🔗 SOME PRACTICAL EXAMPLES OF THE APPLICATION OF BIOECONOMY PRINCIPLES



Industry rules for construction using hempcrete: a tool for opening up markets to biosourced products

These industry rules were established in 2007 in collaboration with the ministries responsible for national infrastructure and agriculture, alongside a non-profit association Construire en Chanvre (building with hemp) and they have been steadily improved and validated by Agence Qualité Construction (agency for quality building). They meet the requirements for ten-year construction insurance, thereby opening up the newbuild and major refurbishment markets.

They must be applied by builders who have duly attended approved training in the methods for using the materials concerned.

Making the use of hemp possible in construction means getting the benefit of a range of positive externalities for the equivalent of 1,000 new buildings every year:

- ▶ using a plant that is a model for sustainable development – requiring neither pesticides nor irrigation and offering longer crop rotation periods,
- ▶ reducing the pollution involved in building, with a positive differential of 26 tonnes of CO₂ between a standard 100 sq. m. (total net floor area) housing unit and one built with hempcrete and hemp wool insulation,
- ▶ developing employment reservoirs in agriculture and industry, providing qualified jobs impossible to relocate abroad,
- ▶ providing thermal, acoustic, seismic, hygrothermal and sanitary high performance,
- ▶ using healthy, renewable materials (hempcrete and hemp wool insulation). ●



Methanization, production of energy and fertilizer using locally available resources

Methanization is a process whereby organic matter is degraded in the absence of oxygen. The result is biogas and a residue, the digestate. The biogas can be processed to make electricity and heat (cogeneration) or biomethane (added to natural gas supplies or used directly, as vehicle fuel for example).

The digestate has fertilizing properties. Projects are being set up for one or more of the above purposes to reflect the needs of local regions: reduction in greenhouse gas emissions from farm effluent, waste management, continuous production of renewable energy and fertilizer, creation of value-added for producers of biowaste, and more.

► **Geotexia** (Côtes-d'Armor) involves farmers, agrifood companies, elected representatives and an energy company. This collective facility can process superfluous nitrogen for use outside the local area while at the same time producing electricity and heat. Discharged water irrigates planting areas for a local energy wood facility.

► **AgriBioMéthane** (Vendée) is an initiative by four livestock farms. Their slurry and manure and agrifood byproducts and waste are digested in this plant. The biogas it produces is purified to make biomethane with a composition equivalent to that of natural gas, which is then injected into the GrDF supply network and used on a trial basis as a fuel for school buses.

► **Sur Biovalsan** (Lower Rhine) involves the methanization of slurry from urban wastewater treatment plants in Strasbourg to produce biomethane for injection into the Strasbourg gas supply.

► **Trifyl** (Tarn) is a combined public/private entity at département level. (Unused) residual waste is taken to a bioreactor. The biogas this produces is used in three different ways: cogeneration, biomethane for vehicle fuel, and hydrogen. Thirteen utility vehicles, a tractor and a general-use tipper truck run on biomethane fuel. Trifyl is also involved in a project for conducting trials of biogas processing to make hydrogen. ●

TO FIND OUT MORE:

[agriculture.gouv.fr/
la-bioeconomie-
un-foisonnement-
de-projets](http://agriculture.gouv.fr/la-bioeconomie-un-foisonnement-de-projets)

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Tembec in Tartas in France's Landes region: conversion of a cellulose pulp mill into a lignocellulose biorefinery

In 1994 Tembec, a forest product group, decided to purchase a cellulose pulp mill in the Landes owned at the time by the Saint Gobain group. By 2016 the plant had been totally transformed and provides an example of industrial diversification for a sustainable and profitable bioeconomy.

The business model for the company was overhauled first, positioning it in a specialty market: production of dissolving pulp for high value-added chemical uses in the pharmaceutical and food industries.

The other components of the wood – the raw material for the biorefinery – are also processed for the chemicals market: industrial lignins and tall oil soaps (resin).

The biorefinery operations involved are energy-intensive: the fuels burned by the plant are now exclusively of plant origin (non-paper forest biomass and black liquor from papermaking).

The thermal energy generated is converted into green electricity which is sold on to the national supplier.

These changes have also led to a significant reduction in the site's environmental impact.



This industrial complex required major investment from the Tembec group (more than €150m over 20 years), a continuous R&D effort and financial support from institutional partners at the national, regional and département levels. ●