



Developing sustainable miscanthus projects in France & Europe

21 11 2022

Novabiom in Numbers

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- ❑ Established in 2007, leading miscanthus player in France and Europe.
- ❑ 17 employees + 60 seasonal workers
- ❑ Over 8000 ha planted in France and Europe since 2007

❑ Activities:

Miscanthus Planting:

- Largest nurseries in Europe: +1,500 ha capacity per year (and scale up skills)
- Crop establishment capacities : 20 planting machines

Miscanthus products dealer:

- Over 10,000 t / year
- Miscanthus processing activities
- New product development
- Supply for farmers, communities and industries



Novabiom – Miscanthus pioneer in France & Europe

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□ Our mission :

« Create quality, sustainable and local miscanthus solutions, together with farmers »

□ In practice:

- High quality rhizomes and planting techniques
- Promotion of value-added usages:
Animal bedding, mulching
- Development of value-added miscanthus processing in order to supply manufacturers.
i.e. bioplastics, animal feed, horticulturists
- Energy is part of end-uses since the beginning of Novabiom. Special attention for multi benefit projects.



Novabiom in Europe

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Novabiom plantations: ▼

- France
- Belgium
- Spain
- Italy
- Croatia

Novabiom miscanthus product supply: ▼

- Germany
- Italy
- The Netherlands
- Belgium



Miscanthus market dynamics in France

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- ❑ Novabiom fosters French market development:
 - Quality miscanthus establishment
 - Optional harvest buy back to Novabiom
 - Profitability for farmers through local value-added usages
- ❑ Miscanthus is an investment crop for French farmers, and the duration also secures their investment
- ❑ Prices are indexed over time and thus secured
- ❑ Use of local biomass, in a short circuit, in a manner dedicated to the project
- ❑ Novabiom develops locally built supply plans: energy or industry supply plans
- ❑ Novabiom's miscanthus processing enables adding value for new products and reaching bigger markets through lower transportation costs



Miscanthus Product Dealer

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- ❑ Supply of over 10,000 t per year

Miscanthus processing:

- ❑ Dedusted & sieved Bales
 - Horticultural & horse bedding
- ❑ Pellets
 - Combustion, bedding & mulching
- ❑ Growing media
 - Strawberries, compost
- ❑ Micronized miscanthus
 - biobased materials & compounds
- ❑ Miscanthus flour
 - Dairy cows & piglets bedding
 - Animal feed

Key points: Quality control, product consistency, reliability, access to high miscanthus volumes



Miscanthus Bales

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- ❑ Sieved, dedusted, compacted

Markets:

- ❑ Horticulture industries
- ❑ Mulching for city green spaces
- ❑ Garden centers
- ❑ Horse bedding



Miscanthus Pellets – no additives

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- ❑ Since 2022, Novabiom transforms miscanthus into pellets
 - Horse bedding
 - Combustion
 - New products: animal feed
 - Reduced transportation costs, easy stockage and handling
 - Interesting price comparison with wood pellets
 - Sustainable
- ❑ Combustion requires technical know-how
 - Boilers : Heizomat, Vyncke...
 - 3 – 10 kW adapted stoves are being studied

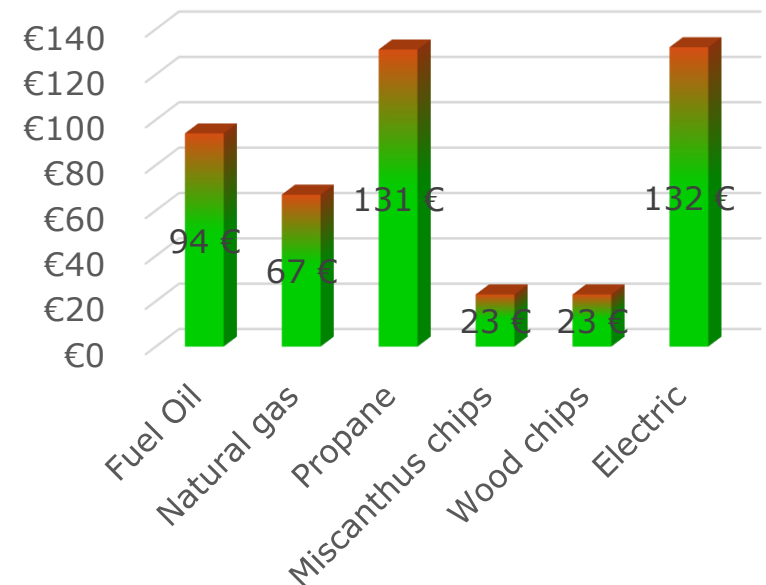


Miscanthus Energy

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- ❑ Miscanthus as a biofuel is steadily growing in France since 2007
- ❑ More than fifty 100% miscanthus projects are now operational, some of them for more than 15 years
- ❑ Key features :
 - Very local, crop is grown less than 5 km from the heating facility
 - Low end size : 50 to 500 kW
 - Marginal lands
 - Mainly 100% miscanthus, some cocombustion cases (with wood chips)
 - In synergy with local communities that improve water quality
- ❑ Demand acceleration since summer 2022. Novabiom is working on bigger projects (500 kW to 5 MW), that stay at a local scale

Price for 1 MWh boiler energy according to fuel type (before 2022)

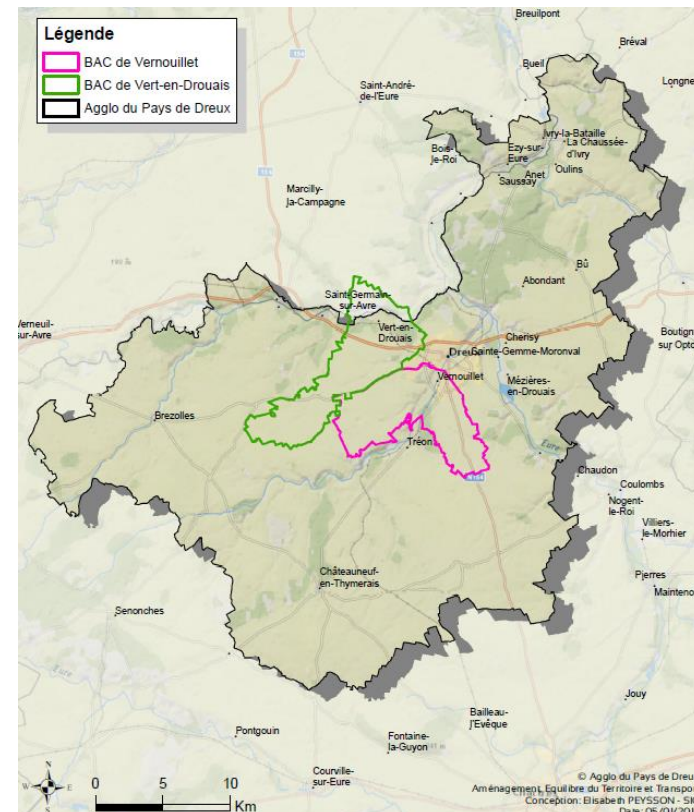


**1 ha =
15 T miscanthus =
6 000 L de fuel oil =
6 households**

Success story : Community sustainability and water quality - Dreux

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- ❑ The 10 water catchments operated by Pays de Dreux have been classified as priority water catchments by the Grenelle de l'Environnement. They are therefore subject to agricultural and nonagricultural action plans
- ❑ Miscanthus is a low input solution that was by local government as a solution to increase water quality
- ❑ 10 hectares planted in 2022, a gradual increase on all water catchment areas is planned
- ❑ District heating facility and network under development



Success story : Poultry Breeder Dumoulin

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- ❑ CO2 emission & cost reduction
- ❑ 4 Poultry houses heated with 8 ha miscanthus
- ❑ 2x 500 kW - Heizomat
- ❑ Ultralocal solution
- ❑ Polycombustion includes wood chips that are locally produced
- ❑ Recycling local waste water from a nearby Juice Factory to optimise miscanthus yield



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