

Solar Thermal Energy in French Agriculture

AIM: presenting the French agricultural domain, its potential for Solar Thermal Energy (STE) application and its key sectors.

METHOD: summarizing this ambition by highlighting results from interviews, academic and official documents analyses.

Use of Renewable Energy in Agriculture

Share of Renewable Energy: 3%

Price of energies (2019):

- Electricity: 0.094€/kWh
- Photovoltaic: 0.086–0.143€/kWh
- Biomass: 0.062–0.122€/kWh
- Natural gas: 0.036€/kWh

National Aids & Legal Framework for STE

- ADEME & Calls for Fond Chaleur
- Certification: CSTBat, Solarkeymark...
- CEE: assistance in installing RE
- Schemes from the Chambers of Agriculture
- PCAE: aid for competitiveness

Milk-Fed Calves

- **Holding:**
 - Total: 6 000 farms (≈ 250 calves)
 - Target candidates for STE: 2222 farms with more than 50 places
- **Main Energy Used:** Liquefied Petrol Gas
- **Average Direct Consumption over 22-week (usual rearing period):**
 - 152 kWh/calf (all activities/100%)
 - 108 kWh only for drinking (= 71%)

KEY SECTORS FOR STE

Dairy Farms

- **Holding:**
 - Total: 62000 with in average 59 cows
 - Target candidates for STE = On-farm processing: 3000 farms
- **Main Energy Used:** Fuel oil & Electricity
- **Average Direct Consumption:**
 - 120 kWh/cow for cleaning
 - 254 kWh/milk (L) for processing
- **Water per day:** between 200 & 500L/cow

Greenhouses

- **Holding (tomato & cucumber):**
 - Horticulture: 1105 ha
 - Market Gardening: 1081.6 ha
- **Main Energy Used:** Electricity & Gas
- **Average Direct Consumption:**
 - Horticulture: 160kWh/m2/year
 - Market Gardening: 317kWh/m2/year

Pig Farms

- **Holding:**
 - Total: 22000 farms
 - 5700 farms with around 190 sows cf. those farms owns 98% total sows
- **Main Energy Used:** Electricity & Fuel Oil
- **Average Direct Consumption:**
 - Maternity stage: 729kWh/place (80%)
 - Post-Weaning stage: 67kWh/place (79%)

3 particularly appropriate sectors: Milk-Fed Calf Farms, Dairy Farms & Horticulture

2 other sectors of interest: Tomato Market Gardenings & Maternity Pig Farms

2 sectors with low potential currently: Poultry Farms & Post-Weaning/Fattening Pig Farms