Solar Thermal Energy in Dutch Agriculture

Low carbon

Interreg North-West Europe
ICARE4FARMS
European Regional Development Fund

AIM: presenting the Dutch agricultural domain, it's 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: 45%

Price of energies (2019):

- Photovoltaic: 0.09-0.106€/kWh
- Electricity: 0.20€/kWh
- Biomass: 0.047-0.124€/kWh
- Natural gas: 0.11€/kWh

National Aids & Legal Framework for STE

- SDE++ Subsidy
- ISDE Investment Subsidy
- Energy-saving / production of renewable energy schemes at provincial & municipal levels

KEY SECTORS FOR STE

Milk-Fed Calves

- **Average Direct Consumption over 22-week (usual rearing period) :**
  - 152 kWh/calf (all activities)
  - 110 kWh/calf (milk drinking only)
- **Holding :** Total: 1 599 farms (≈ 663 calves)
  Target candidates for STE: All
- **Main Energy Used :** Electricity & Natural Gas

Dairy Farms

- **Holding :**
  Total: 17 000 companies (~110 cows)

  Target candidates for STE with on-farm processing: 2 200 holdings owning at least 150 cows
- **Water per day :**
  between 200 & 500L/cow
- **Main Energy Used :**
  Electricity
- **Average Direct Consumption :**
  o 120 kWh/cow for cleaning
  o 254 kWh/liter of milk for processing

Pig Farms

- **Holding :**
  o Total: 4 056 farms (≈ 2992 pigs each)

  cf. 11.855 M pigs & 1.007 M sows
- **Average Direct Consumption :**
  o Maternity stage: 729kWh/place (80%)
  o Post-Weaning stage: 67kWh/place (79%)
- **Main Energy Used:** Electricity & Gas

Greenhouse

- **Holding :**
  3500 glasshouses
  o Horticulture: 3476 ha
  o Market Gardening: 4816 ha
- **Average Direct Consumption :**
  o Horticulture: 160kWh/m2/year
  o Market Gardening: 317kWh/m2/year
- **Main Energy Used :** Natural Gas for CHP

2 particularly appropriate sectors: Milk-Fed Calf Farms & Dairy Farms

1 other sectors of interest: Pig farms on a case by case basis

2 sectors with low potential currently: Poultry Farms & Horticulture

Sources: Market Analysis I4F: www.nweurope.eu/icare4farms