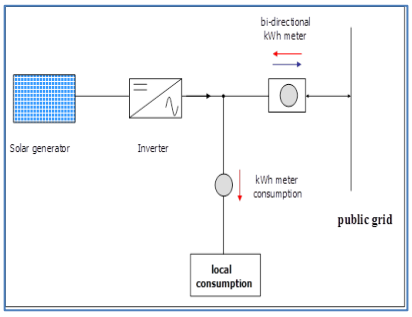
COUNTRY:
CHILE

SOLAR POWERED IRRIGATION SYSTEMS – COUNTRY CASE STUDY AZAPA-INIA



Geographical Location:

- Arica, Azapa Valley
- Latitude: 18°34’11” S
- Longitude: 70°6’2” W
- Altitude: 55 m

Specific Site Conditions:

- Climatic condition: arid
- Poor soil conditions, structure topsoil imported from nearby sites
- Farm located in main production area of Arica, established in 1990
- Irrigation water is provided by canal system from which open reservoirs are filled on regular basis (scheduled supply)
- Previous irrigation was based on surface (furrow) approach
- Farm is one of the first having a grid-connected PV system
- About 50% of PV energy is used for irrigation

Salient Features of Solar-powered Irrigation System:

- Grid-connected pilot system with battery storage and net-metering
- 5 kW_p PV generator produces about 25 kWh/day and supplies energy for all electrical appliances on the farm, including the irrigation system
- Two conventional 220 Volt motor pumps of 1.5 kW each
- Daily mean water output: 63 m^3/day
- Pumping Head: 8 m
- Drip irrigation system using drip line 1/2" with built-in turbulent flow emitters (discharge 0,6 gph)
- System includes central fertigation unit (electric booster pump to inject nutrient solution)

System Costs / Financing:

- PV system: 17,860 EUR
- Irrigation system: - not disclosed -
- PV system financed by: Fondo de Innovación para la Competividad (FIC); Gobierno Regional de Arica y Parinacota; Instituto de Investigaciones Agropecuarias (INIA URURI) based on a 80% subsidy
- Irrigation system financing from own equity

Farming System / Cropping Patterns:

- Horticultural farming under net houses
- Main products: Flowers and passion fruit, additional tomato cultivation
- Farm size: 5.1 ha but only 3,5 ha under irrigation
- Crop rotation: Flowers every 3 years, passion fruit every 3 – 4 years
- Fertiliser and nutrient management via fertigation unit
- Labour-intensive production

Experiences / Lessons Learnt:

- For a grid-connected irrigation system, it is important that
  - The electric grid is stable
  - A tariff system is established (e.g. net-metering, feed-in-tariff)
  - Legal and regulatory framework allows the PV connection
- Grid failure for a longer period of time and the resulting lack of water could cause serious damage to flower crop
- If grid stability cannot be secured, a back-up solution is required

Promoting and Planning Bodies:

- System financed by Fondo de Innovación para la Competividad (FIC); Gobierno Regional de Arica y Parinacota
- Supported by Instituto de Investigaciónes Agropecuarias (INIA URURI)
- System integrator: Arica Solar, Chile