

Hybrid irrigation in Spain

Automate your business with solar water pumping



Subject	Apple farm	Location	Zaragoza, Spain
Application	Irrigation	Project Partner	AMB Greenpower
Size	18 ha, 830 m ³ /day max	Installation	2016

An apple tree farm in northern Spain recently expanded from 3 ha to 18 ha of agricultural area. The area was previously irrigated with a standard AC water pump powered by a 200 kVA diesel generator.

The farm has high operating costs of € 27,000 per year with the main factors being diesel supply and generator maintenance. The operating costs are endangering the future profitability of the farm altogether.

Replacing the diesel pump with a LORENTZ hybrid solar system significantly lowered the operating costs and automated the irrigation, helping to fund further development of the farm and to secure future profitability.

Problem

A client of AMB Greenpower runs an apple tree farm he recently expanded from 3 to 18 ha of land in northern Spain. In relation to the size of the farm it has very high operating costs of € 27.000 per year.

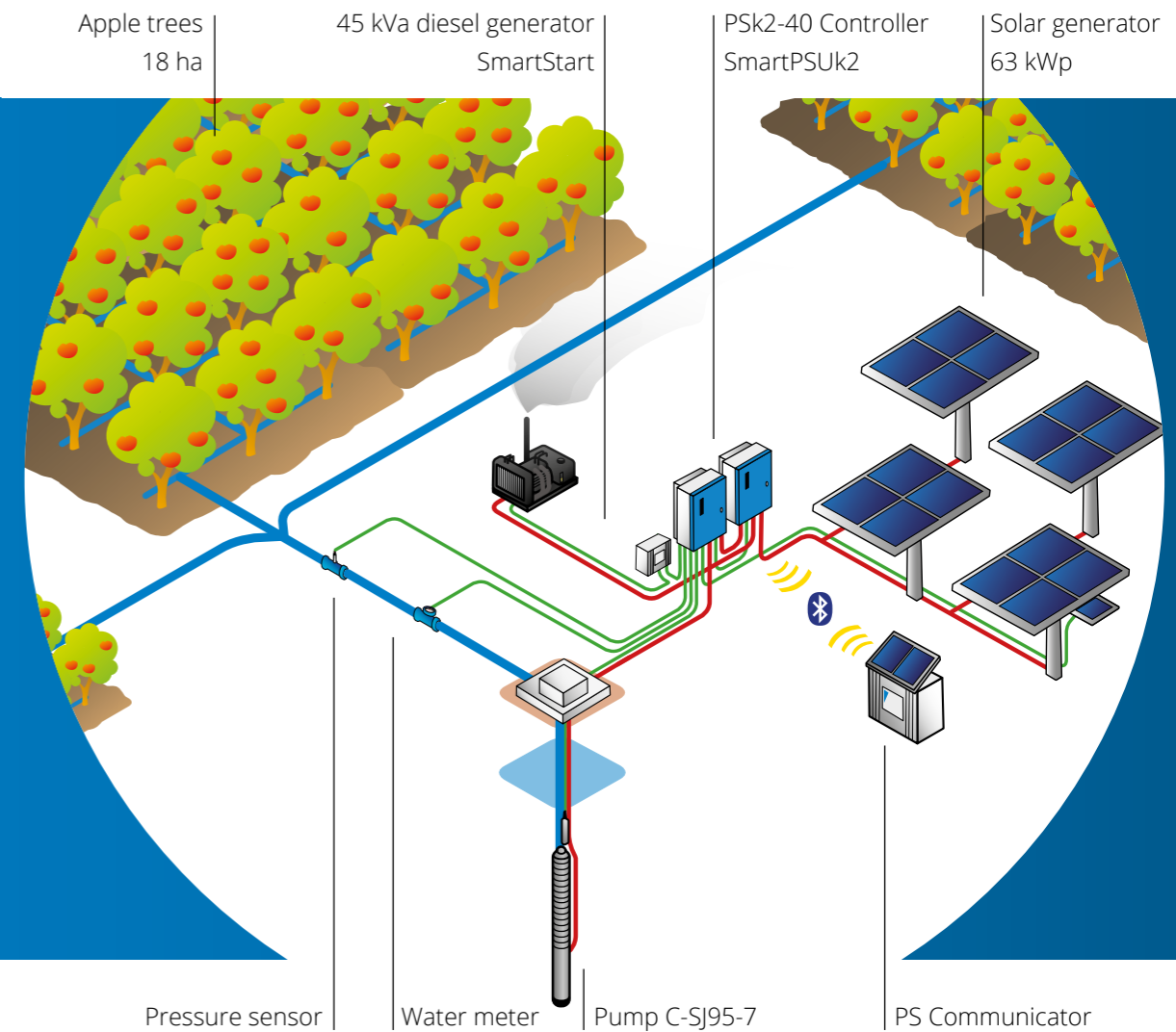
There are plans to further develop the farm with a new agricultural warehouse but due to the operational costs this is not possible. With rising fuel prices the profitability and sustainability of the farm are in danger altogether.

Solution



AMB Greenpower designed a solution featuring the LORENTZ PS40k2 C-SJ95-7 pump system with a 63 kWp solar array for an average daily output of 687 m³.

This system is capable of irrigating the complete agricultural area most of the year on solar power only, minimizing operational costs.



A substantial part of the operating costs are in running and maintaining a large AC water pump powered by a 200 kVA diesel generator to irrigate the apple trees. As the cost for fossil fuels will rise and the fruit market is price

sensitive an alternative irrigation solution must be found. Requirements are a quick return on invest, low future operational costs and having the flexibility to adjust the irrigation system to changing water demands.

For flexibility LORENTZ SmartPSUk2 and SmartStart were installed. They allow to connect a diesel generator as an auxiliary power source to the PSk2 controller. This allows to extend the pumping day with seamless transition.

The use of solar power is maximized during the day time, should more water be required the diesel can then automatically be activated for a pre-defined time and until a set total amount of water is pumped.

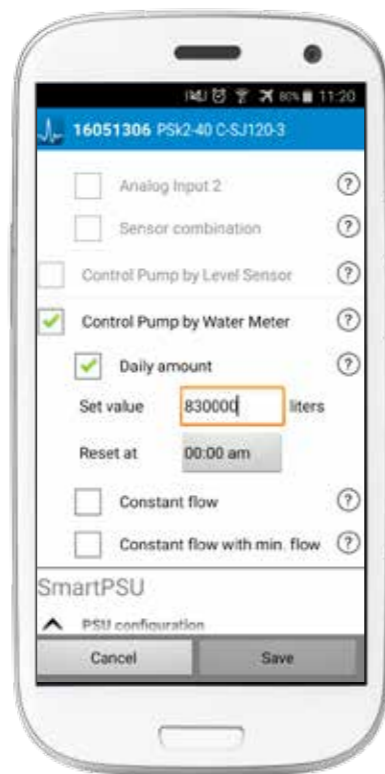


Automation features

PSk2-XX systems have enhanced software control features through the LORENTZ App PumpScanner to automate irrigation.

The installed PSk2-40, SmartPSUk2 and SmartStart are configured to:

- ▶ pump a daily amount of 830 m³ in the fruiting season between July and September. The counter is reset in the morning hours to maximize the use of solar power.
- ▶ provide a constant pressure of 2.5 bar to match the requirements of the irrigation system.
- ▶ blend in AC power when the irradiation drops below a certain level. The pump will turn off automatically when reaching the defined water amount per day, minimizing AC power usage.
- ▶ activate a switch output to start a fertilizer injection pump when the LORENTZ pump is running.



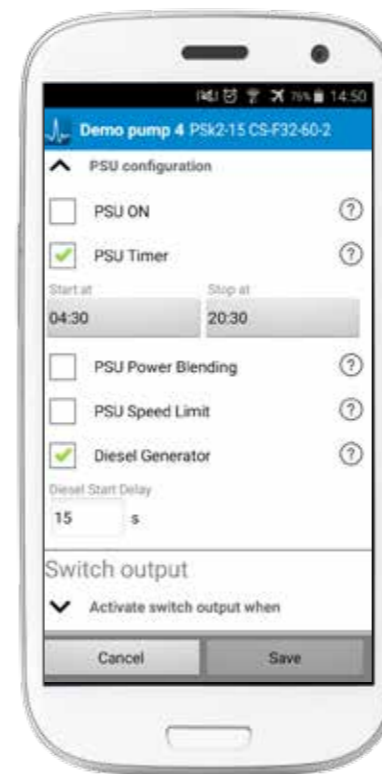
Daily amount

The system is setup to deliver a specified amount of water every day. The reset time for the 24 hour cycle can be adjusted to make best use of the solar day.



Constant pressure

For seamless integration into existing irrigation systems the PSk2-XX can be configured to deliver a specific constant pressure.



SmartPSUk2

With a SmartPSUk2 installed, the PSk2 runs primarily on solar but can seamlessly either blend in either grid or generator powers automatically if required and configured.



Output switch

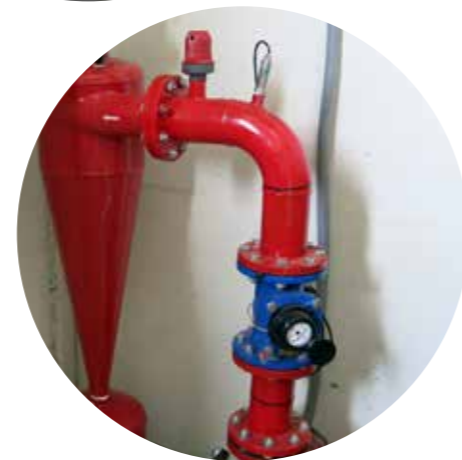
The SmartStart has a secondary output switch which can automatically be triggered based on status of the pump, the Sun Sensor, connected well probes or remote switches.

Monitoring

With the enhanced software features most of the irrigation process is handled automatically according to the pump configuration.

- ▶ To remotely monitor and manage this process, as it is done in most modern irrigation systems, a PS Communicator was installed on site. The PS Communicator transmits pump data to the LORENTZ browser based remote monitoring platform pumpMANAGER using the 2G GSM network. This data is accessible from anywhere with an internet connection.





Clockwise:

- ▶ PSk2-40, SmartPSUK2 and SmartStart
- ▶ LORENTZ pressure sensor and water meter
- ▶ Well head for LORENTZ C-SJ95-7
- ▶ Expanded agricultural area, apple tree seedlings

“AMB Greenpower highlighted that LORENTZ offers a complete hybrid solution that seamlessly integrates into the existing irrigation control infrastructure.”

says Daniel Gómez of Suministros Orduña.

“Now they could further develop the farm and can even downsize the backup generator to extend the irrigation time in the summer months if they need even more water”.



▶ Operational costs have been lowered by 80%, the RoI is around 3 years. The 200 kVA generator can now be replaced by a 45 kVA generator for backup power adding additional savings. The farm now runs an economically and ecologically sustainable business model, the savings fund the new agricultural warehouse.



▶ Irrigation is optimized and automated. The LORENTZ system delivers the water at the pressure required by the irrigation system. It maximizes solar energy, blends in AC power if required and stops the pump when reaching the irrigation target to not flood the fruits. Ancillary equipment can be automatically switched.



▶ The system is fully monitored. Locally settings can be changed and performance data can be accessed via the free LORENTZ Android™ App PumpScanner, remotely these options are available online through LORENTZ pumpMANAGER. Pump behaviour can be adjusted by the click of a button.

Contact

About Suministros Orduña

Suministros Orduña is a LORENTZ distribution partner for Spain, specialised on PV technology and solar pumping.

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About AMB Greenpower

AMB Greenpower aims to deliver the best renewable energy solutions available. With highly qualified and experienced staff they provide concept creation and project planning, system design, installation and after sales service.

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About LORENTZ

LORENTZ is the global market leader in solar powered water pumping solutions. Founded in Germany during 1993 LORENTZ has pioneered, innovated and excelled in the engineering and manufacturing of solar powered water pumping. Today LORENTZ is active in over 130 countries through a dedicated network of professional partners. LORENTZ technology uses the power of the sun to pump water, sustaining and enhancing the life of millions of people, their livestock and crops.

Simply - **Sun. Water. Life.**



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