Turning sunlight into strategy: how direct marketing is powering Europe's solar future

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The energy transition is one of the greatest challenges and, at the same time, one of the most important opportunities of our time. It requires not only technological innovations but also new business models and market mechanisms. In this context, direct marketing has established itself as a forward-looking model that promotes both the integration of renewables into the energy market and the economic viability of energy generation plants. This technical article examines the principles, models and solutions for the direct marketing of photovoltaic (PV) electricity in Europe.

Direct marketing: basics and development

Direct marketing involves the direct sale of electricity from renewable energy sources by the producer to the market, in contrast to the traditional feed-in tariff, where the electricity is sold to grid operators at fixed prices. This model enables plant operators to benefit from market price fluctuations and contributes to the market integration of renewable energies.

Direct marketing provides several important advantages for incorporating renewable energy into the electricity market. A key benefit is enhanced market participation and price flexibility. Unlike traditional fixed price models, direct marketing introduces a more dynamic and flexible market structure where prices are determined by supply and demand. This not only enhances competitiveness but also supports the integration of renewable energy sources into the broader energy system.

Another advantage is the ability to optimise plant output. By aligning electricity production with real-time market conditions, plant operators can maximise their revenues. Achieving this, however, depends on the availability of accurate electricity production


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forecasts and a strong understanding of market dynamics.

Additionally, direct marketing enhances financial security for plant operators. By utilising mechanisms like market premiums and other forms of remuneration, operators can secure a stable income while still benefiting from potential increases in market prices.

Direct marketing models

Two different direct marketing models have become established in Europe. With the market premium model, plant operators sell their electricity directly on the market. They also receive a market premium that compensates for the difference between the average market price and a fixed subsidy amount. This model is widespread in many European countries.

The other model is power purchase agreements (PPA). Long-term power purchase agreements between producers and buyers that guarantee fixed prices over several years. PPAs are becoming increasingly important, particularly in countries where state subsidies are declining.

Development in individual countries

The two models provide the framework for implementation and the boundary conditions. The individual European countries have also defined and regulated the technical requirements for PV systems.

Direct marketing in Germany

In Germany, direct marketing is governed by the Renewable Energy Sources Act (EEG), which sets out the legal framework for integrating renewable energy into the market.

A central component of this legislation is the market premium model, which was introduced in 2012. Since then, operators of photovoltaic systems with an installed capacity exceeding 100 kW, have been legally required to market their electricity directly.

Smaller systems, although under no obligation, have the option to participate voluntarily in direct marketing.

To support this model, system operators receive a market premium in addition to the revenue earned from selling electricity. This premium is designed to offset the difference between the fluctuating market price and a predetermined reference price. Thus maintaining a degree of financial security while encouraging market participation.

In terms of technical requirements, PV systems must be equipped with real-time data retrieval capabilities. This data is accessed by both the direct marketer and the grid operator, using technologies such as smart meter gateways or communication interfaces like VPN connections, APIs, or mobile modules.

Another key requirement is remote controllability. PV systems must be capable of being adjusted and controlled remotely, allowing operators to respond swiftly to fluctuations in the electricity grid and support grid stability.

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Finally, operators are also required to provide forecasts for both load and feed-in. These forecasts, generated and transmitted by the direct marketer, rely on a combination of weather data and historical production figures.

Accurate forecasting is essential for aligning production with market conditions and for optimizing the financial returns from direct marketing.

Direct marketing in Switzerland

In Switzerland, direct marketing is regulated by the feed-in tariff system. Here, operators of PV systems with an output of more than 500 kW that already receive feed-in remuneration under previous legislation are obliged to market their electricity directly.

Systems from 100 kW that are newly included in the feed-in tariff system are also obliged to market their electricity directly.

Technical requirements are data communication, remote controllability and forecasting capability.

Direct marketing in Austria

Austria has a direct marketing system that is regulated by the Green Electricity Act. Operators of PV systems with an output of more than 500 kW are obliged to market their electricity directly.

Technical requirements are smart metering system, communication capability and controllability and flexibility.

Direct marketing in France

In France, direct marketing is regulated by the law on the energy transition 'Loi relative à la transition énergétique pour la croissance verte'. Operators of PV systems with an output of more than 100 kW are obliged to market their electricity directly.

Technical requirements are data transmission, remote controllability and forecasting capability.

Direct marketing in Spain

Spain has an advanced system for direct marketing, which is regulated by Royal Decree 413/2014 and Law 24/2013 on the electricity sector. System operators can sell their electricity directly on the market and receive a market premium that compensates for the difference between the market price and a predetermined price.

Technical requirements are measurement and monitoring systems, connection to the communication network and flexibility and controllability.

Direct marketing in Italy

In Italy, direct marketing is regulated by Legislative Decree 387/2003 and the Ministerial Decree of 6 July 2012. PV system operators have the opportunity to engage in the balancing energy market and sell their electricity independently.

Technical requirements are monitoring and control, data communication and load management.

Technical implementation for smooth participation in direct marketing

To meet the technical requirements for direct marketing, various providers offer specialized solutions.

One of the leading companies in the field of energy management systems is Solar-Log GmbH. Their products are designed to support the seamless integration of photovoltaic (PV) systems into the direct marketing framework, offering a range of essential functions.

A key feature of Solar-Log's system is its ability to continuously monitor production data. This ensures that system operators always have access to up-to-date information. The system also facilitates real-time data communication, making it possible to share this data with direct marketers and, if needed, grid operators. Such functionality supports accurate forecasting and enables adjustments to electricity production as required.

Another important capability is remote controllability. Solar-Log allows PV systems to be controlled remotely, which is crucial for adjusting feed-in according to market dynamics and grid demands. This feature

meets the legal requirement for PV systems exceeding 100 kWp to be controllable and contributes to grid stability by helping operators respond quickly to fluctuations.

In terms of forecasting, Solar-Log utilizes advanced tools that combine weather data with historical production information to generate reliable electricity output forecasts. These forecasts are essential for maximizing revenues through direct marketing as they allow production planning to align more effectively with market conditions.

Furthermore, the system includes automatic fault detection and alarm functions. By promptly alerting operators to issues, the system helps ensure operational reliability and reduces potential downtime.

Benefits of direct marketing with a professional system

Using a professional energy management system like Solar-Log brings numerous advantages to PV system operators engaged in direct marketing.

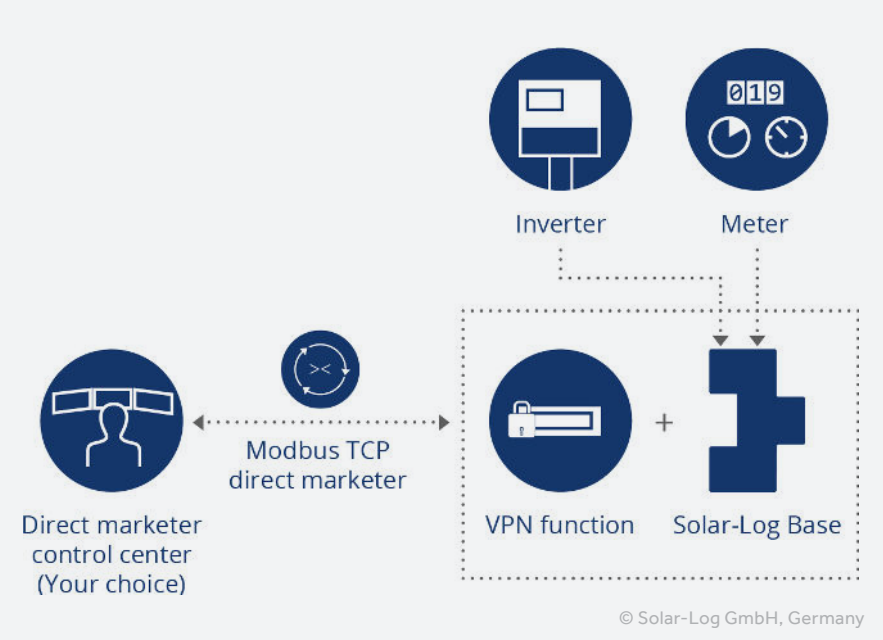

Figure 1: The integrated VPN function in the Solar-Log™ hardware enables the connection to all common direct marketing partners

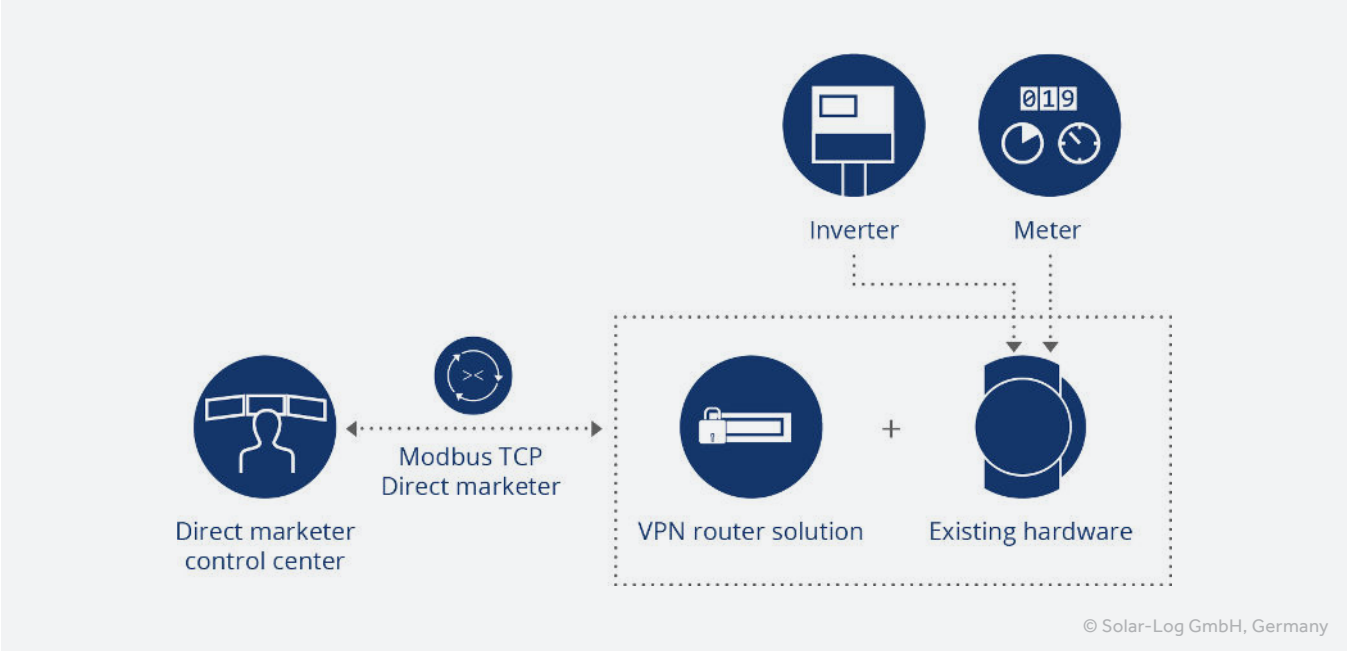

Figure 2: VPN router solution: A pre-configured router is connected to the existing hardware and takes over communication with the direct marketing partner

One of the primary benefits is the optimization of system performance. Thanks to real-time monitoring and in-depth data analysis, operators can fine-tune their systems for better output. The integration of precise forecasting and remote control features also enables flexible adaptation to market requirements.

Financial security is also enhanced through continuous monitoring and active production management. System operators can rely on a stable and predictable performance, which supports revenue stability.

Administrative tasks are greatly reduced as well. Solar-Log supports data exchange with all major direct marketers and automates the transmission process, significantly reducing work for operators.

Lastly, the system contributes to improved grid stability. The ability to flexibly manage feed-in plays an essential role in maintaining a stable electricity grid, which is especially important given the ongoing expansion of renewable energy sources. The combination of monitoring capabilities and rapid fault detection ensures reliable performance within the European interconnected power grid.

Summary

The direct marketing of PV electricity in many European countries is characterized by specific legal regulations and technical requirements. These regulations and requirements are designed to promote the integration of renewable energies into the energy market while maximizing economic efficiency for system operators.

The direct marketing of PV electricity with professional energy management systems offers comprehensive technical support that maximises the efficiency and profitability of PV systems.

Monitoring, flexible controllability and precise forecasting tools are key functions that help system operators to optimize their production in line with market conditions. Operators of PV systems can thus reduce the administrative effort and ensure the continuous operation of their system.

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