With 150 GW connected worldwide, our experience is your advantage.

Minimising risk, maximising return

The demand for safe, clean reliable renewable power is growing at an ever increasing rate. Today PV technology is not only ecologically, but also economically a sensible alternative for power generation. A large scale PV power plant has to be competitive against conventional energy sources as well as other PV projects. With the elimination of government subsidies for this kind of energy generation in many regions and markets, the focus has now shifted to the plant's overall efficiency.

'A minimal investment in high-quality components can have a big impact on a project's bankability, improving the safety and efficiency of an installation and protecting its long-term health.'

In the face of increasing cost-consciousness within all industrial sectors, the downward pressure on costs as well as on BOS components (balance of system) are becoming more and more crucial. Due to this, profitability has been lagging, so companies try to optimise CAPEX costs mainly and safe money on these components – often even during the design phase. But the real keys to improvement are both better capital and operational efficiency. The determining factor concerning favourable conditions for investment loans and credits is the profitability of a project during the operation period on the basis of reliable partners, components and an adequate operation and maintenance.

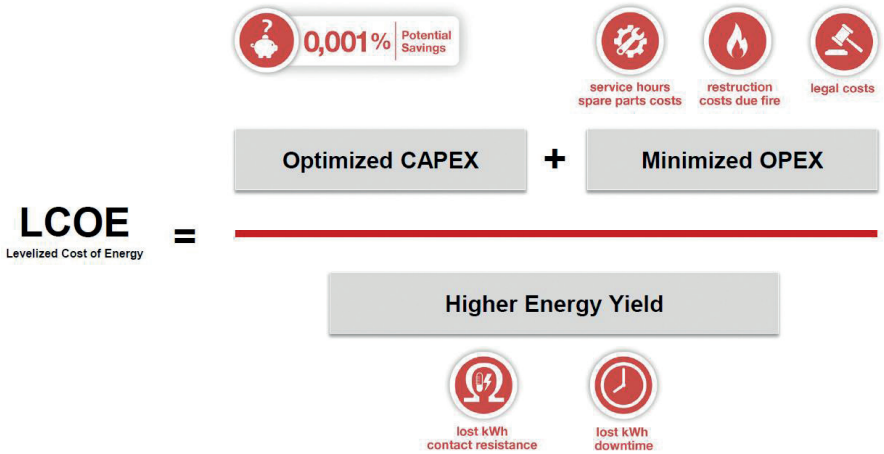
When it comes to the profitability and the return on investment of a PV project, a low LCOE (Levelised Cost of Energy) is the deciding factor. This crucial metric, expressed in cents per kilowatt hour (kWh), takes in to account not only the capital cost of building a project, but also operating and maintenance expenses over time, such as the length of a power agreement, cost for fuel, etc. It is used to compare the cost of solar energy to other sources and determines the long term profitability of a power plant.

In order to ensure a competitive LCOE and the success of a PV system, but also the necessary financing, the appropriate, bankable project partners must be chosen. Careful selection of bankable products and components to be built into the system is also a core topic, as these have considerable impact on the bankability of the PV project.

The guiding principle for bankability is to minimise risk while to maximise the return. This can only be achieved through secured efficiency in the long term on the basis of high-quality components.

To ensure both maximum profitability and return and to enhance chances for low interest rates, it is indispensable to take into account that the success of a PV plant relies on several factors. The selection of the PV technology and components is a key parameter for the performance of the plant.

Thorough planning should always provide for carefully chosen project partners and suppliers of components that feature highest reliability. Wrong choices in planning, due to lack of knowledge, or low-quality components, in order to reduce the cost, can cause unexpected loss of production or potential safety issues during the lifecycle of a PV system.



CAPEX, short hand for capital expenditure, is an expenditure which results in the acquisition of permanent asset intended to be permanently used in the business for the purpose of earning revenue; OPEX or operational expenditure applies to expenditure on an ongoing, day-to-day basis in order to run a business or system.

Why save at the wrong place and increasing risks?

During the project planning phase of a PV system, the main focus is on the initial costs and largely on the two highest-cost items: the solar modules and the power inverters. Connectors as crucial part of the cabling are often put aside even though they have to secure safe and reliable transmission of the power being produced. Without constant connection or due to failure, there is no assured feed-in and, as consequence, reduced profitability as well as less return.

Connectors may be small components, but their careful selection and impact on the bankability of every photovoltaic project are substantial. Often neglected during the project planning phase of a PV system, considering the long-term operational and maintenance costs (OPEX) is, however, utterly crucial.

The components for cabling - connectors, junction boxes, cables - play only a minor role in the calculation as they amount to less than 1% of the total initial costs (CAPEX), for connectors an even tinier percentage (approx. 0.003%). Thus, choosing low-end connectors that are about 30% cheaper in price compared to Stäubli connectors might signify an absolutely minor cost differential: That means a potential saving of no more than 0.001% of the initial costs.

Regardless those minuscule potential savings, PV project developers sometimes try to save costs by selecting low-end product-solutions in order to optimise CAPEX. The compromise with quality however involves many risks, endangers the return on investment and can quickly turn those short-term savings into substantial losses.

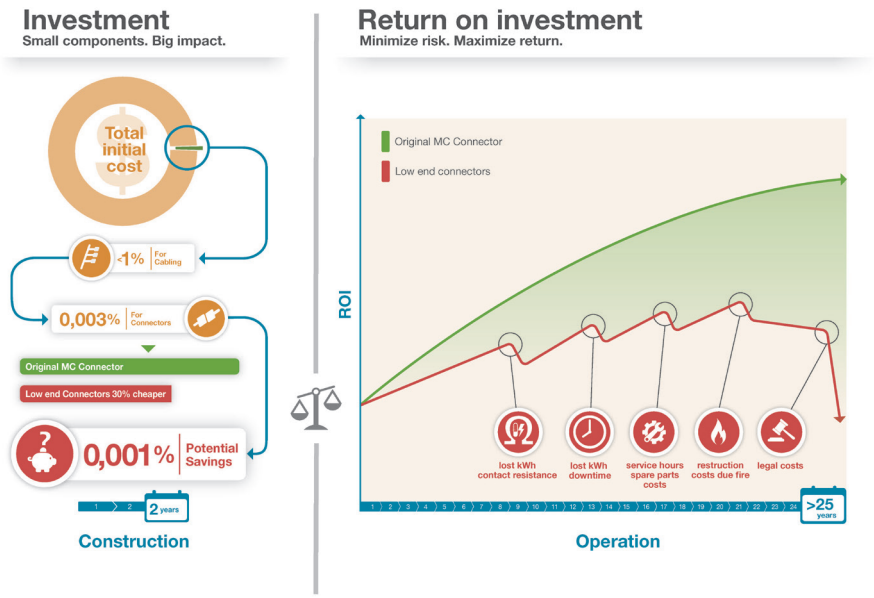
A minimal investment in high-quality components can have a big impact on a project's bankability, improving the safety and efficiency of an installation and protecting its long-term health. The fact has to be stressed that these apparently minor components can have a massive and ultimately decisive influence on the risks and on the return on investment respectively the LCOE of the PV project. If

the wrong decisions are made at this point, the risk of power losses, a (partial) system failure/downtime, or even a fire may all increase and will result in higher operation and maintenance costs (OPEX) as well as lower energy yield during the operation phase. Lower yield inevitably results in a negative impact on the efficiency of a PV plant as a whole.

under any circumstances and may lead to severe damages with a negative affect on the efficiency, as well as the profitability, of a project.

There are several reasons that make Stäubli Electrical Connectors your ideal partner.

Original MC4 connectors set the standard: Since its introduction in 2004, the original MC4 connector has been setting the



Small components (only 0.003% of total initial costs), but still low saving potential. Wrong connector selection can lead to higher operating and maintenance expenses (OPEX) and lower energy yield over time (>25 years). Result: Lower efficiency of the PV system and a negative impact on the Return on investment.

Choosing Low-end connectors over our Original MC4 connectors may have severe consequences for your PV project that could even happen shortly after the initial operation:

- Power and performance loss due to higher contact resistance and defective connectors
- Hotspots and fire due to defective connectors and resulting heat evolution. Damages may also lead to legal cases
- High downtime/PPM-rates and service/maintenance costs due to deficient performance and frequent replacement

The risks mentioned above might also occur due to cross-connection. There are several manufacturers that claim to produce “MC4 and thus Stäubli compatible” components. Cross-Connection, however, is not permitted

industry standard. The outstanding technical characteristics of the innovative MULTILAM advanced contact technology guarantee continuous contact with the contact surface, resulting in a constantly low contact resistance.

Half-way through 2017, we have more than 150 GW of installed photovoltaic capacity, amounting to 50% of the global cumulative PV capacity, connected successfully using our Stäubli photovoltaic connectors. This figure demonstrates the reliability and highest quality of our products. They guarantee proper operation over their whole lifetime (>25 years), defy harsh environmental influences and have a positive impact on the bankability of photovoltaic projects.

Less risk, higher return: The use of reliable, long-lasting Stäubli photovoltaic connectors guarantees low service cost, low power losses and reduced downtime due to their low contact resistance, as well as their elimination of risks for hotspots and fire.

Stäubli therefore is your reliable, bankable partner when it comes to tried and trusted results, as well as giving a sustainable return on investment in the long run.

Meet us at Intersolar Europe in Munich, May 31 - June 02, 2017 | Hall A2 – 540

The Stäubli team will be happy to welcome you to our booth.

www.staubli-alternative-energies.com

Further information

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About Stäubli

Stäubli is a mechatronics solutions provider with three dedicated activities: Connectors, Robotics and Textile. With a global workforce of over 4,500, the company generates annual turnover surpassing 1.1 billion Swiss francs. Originally founded in 1892 as a small workshop in Horgen/Zurich, today Stäubli is an international group headquartered in Pfäffikon, Switzerland. Worldwide, Stäubli operates twelve industrial production sites and 29 subsidiaries, expanded with a network of agents in 50 countries, delivering innovative solutions to all industrial sectors. www.staubli.com/en/profile

About Stäubli Electrical Connectors

Stäubli is a recognised specialist for advanced contact technology and sophisticated solutions with a product portfolio ranging from miniature connectors up to high-power connectors for power transmission, test and measurement, transportation and many other industries. In Photovoltaics, Stäubli is global market leader with its MC4 connector components. The core of all Stäubli electrical connectors is the unique MULTILAM contact technology.

www.staubli.com/electrical