
SOLAR INVERTERS

Bankability of ABB solar inverters

A vital requirement to help mitigate risk and maximize return on investment



ABB has decades of experience in inverter and power converter technology. Our wide product portfolio combined with knowhow and reliability makes ABB one of the leading solar inverter providers around the world.

To us bankability means standing behind our promises over the whole lifetime of the plant, maximizing your return of investment.

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Bankability

A matter of trust

Rapid growth of the PV market and the arrival of numerous new players all through the value chain have made bankability an essential benchmark. Investors, banks and other financing institutions use it to assist with financing decisions.

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01 ABB meets all the requirements of bankability for the solar inverter business. The inverters at this 5 MW power plant in Malmesbury, UK, west of London, are another bankable ABB reference.

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02 Bankability is based on numerous interrelated factors that essentially come down to trustworthiness.

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03 50 MWp PV power plant in Pobeda, Bulgaria, is a good example of the trust placed in ABB solar inverters.

When selecting the solar inverter, the high-tech heart and brain of any PV system, bankability of the supplier is of extreme importance, especially for large scale PV plants.

However, when attempting to define bankability, confusion exists. This is quite simply because bankability assessments vary from bank to bank, and are never based upon a single criterion or universal formula. Instead, achieving bankability depends on numerous interrelated and inter-dependent factors which, when taken together, add up to give decision makers a level of confidence that they can be comfortable with.

In the solar PV inverter market, where a new project may well have a planned lifetime of 20 years or more, the most important factors impacting and deciding the bankability of any supplier generally fall under four main categories.

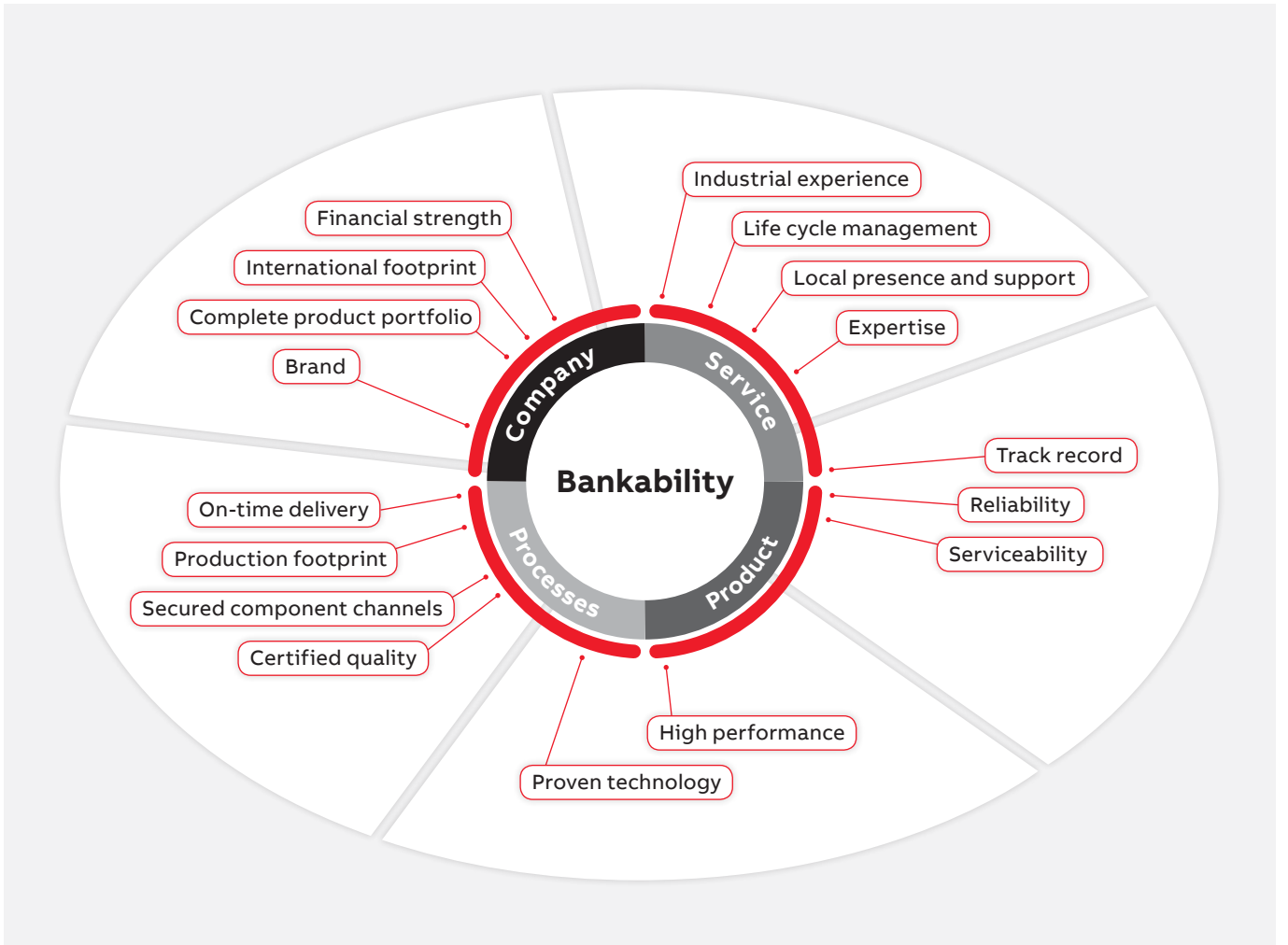
These are:

- **Company**
- **Product**
- **Processes**
- **Service**

The set of deliverables that these four main categories depend upon is graphically illustrated in the diagram on the right.

In this document, the concept of bankability will be explored in detail, as will the bankability credentials that ABB has to satisfy each of these deliverables. By doing so, we hope to increase understanding of the term 'bankability' while at the same time convincing you that ABB's solar inverters are bankable and more fundamentally, a choice that you can confidently trust.





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Company

Standing behind the products

The size, history, reputation, financial foundation, and product portfolio are key variables that influence the credibility of any company in the PV sector. As one of the largest engineering companies in the world, and a recognized leader in the power and automation technology business, ABB as a company has very strong credentials in all of these categories to fulfill the requirements of bankability.

Size, history and brand reputation

ABB has a truly international footprint, operating in over 100 countries worldwide and employing around 136,000 coworkers. It has a history of more than 130 years of technological leadership and a long and illustrious record of innovation in numerous industries. The ABB brand is today recognized as standing for quality, performance and innovation.

Financial strength and diversity

In terms of financial strength, the ABB group is very robust, with annual revenues of around \$34 billion in 2016 and R&D investments of more than \$1,3 billion annually. It is also a diversified company with four major divisions which are further structured into business units. This diversification means that ABB has many legs to stand on instead of being concentrated in only one business.

Complete product portfolio for PV market

ABB offers the PV business a complete product portfolio, with the exception of solar modules and module mounting systems. The product program includes solar inverters, low voltage products, transformers, switchgear and substations for medium and high voltage grid connection. ABB can also offer optimized packaged solutions to support variety of project and customer needs. On top of this, world-class plant automation and monitoring systems are also part of ABB's portfolio.





Product

A reliable solar inverter is the heart and brain of any PV system

In any PV system, the inverter acts as both the heart and brain, safely and efficiently transforming DC power to AC to be used locally or fed to the distribution grid. Thus, to meet bankability requirements, it is absolutely critical that the inverter is highly efficient, reliable, safe and serviceable.



Proven inverter technology and reliability

The ABB solar inverter utilizes over 45 years of experience and advances in inverter and power converter technology. This has helped make ABB the world leader in frequency converters and one of the biggest suppliers of wind turbine converters. Proven components and technology platforms with an established track record ensure maximum reliability and uptime of the plant in demanding applications and harsh environments.

High performance with advanced grid support

Inverter performance is a function of efficiency times reliability times uptime. ABB's inverter technology delivers superb performance based on very high total efficiency, together with verified reliability and an experienced worldwide service organization using proven concepts for maximum uptime. Additionally, inverters in large power plants have to be able to support the grid according to utility requirements. Therefore, ABB solar inverters have the most advanced capabilities in the market based on ABB's long experience in grid management and grid support.

Strong track record

ABB is a leading global solar inverter supplier with a large installed base of different sized inverters. This base is supported by ABB's strong experience and substantial sales volume of power converters in general. For example, ABB has delivered over 100 GW of power converters on the same platform used for PVS800 central inverters. As a result, ABB's PVS800 has gained an established position in the central inverter solar business with over 8 GW of capacity installed in a short period of time.

Serviceability

ABB inverters are designed for fast and easy installation. The industrial design and modular platform provide easy to follow design with trouble-free access on site to the critical parts for simple component replacement and cleaning. In addition, the modular structure supports a wide range of options like integrated DC cabinets and on-site upgrade possibilities. The inverters can also be customized and configured to meet specific end-user needs.



Processes

Standardized, certified and expandable

The production processes applied, and plants at which the inverters are made, play a key role in guaranteeing consistent quality. In addition, they also provide assurance of supply to the market.

Industrial-scale production

Based on an advanced order-delivery process, ABB delivers high-quality, reliable and safe solar inverters on time, every time. This is further assured by modern manufacturing facilities that are equipped with assembly lines using the latest production techniques and advanced software. Efficient material flow and testing routines guarantee high quality of products and short lead times.

Certified Quality

Quality starts from well-designed products. Therefore ABB product development and verification processes are well defined and have e.g. the following certificates:

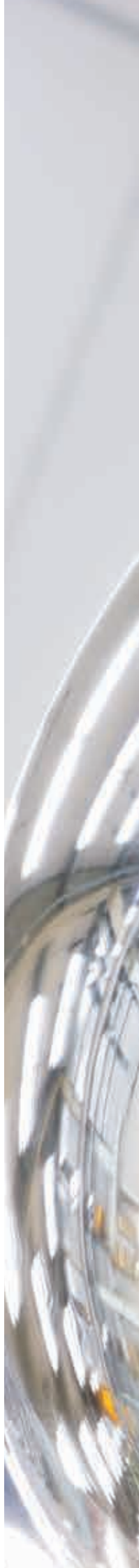
- ISO 9001 Quality Certificate
- Testing facility ISO 17025 Certificate

Inverter reliability is further enhanced via stringent quality control procedures. All of our inverter manufacturing facilities operate with the following certifications:

- ISO 9001 Quality Certificate
- ISO 14001 Environmental Certificate
- Occupational Health and Safety Certificate OHSAS 18001:1999

Global production capabilities

Inverter production facilities located in Estonia, Italy, China and India, supported by strong R&D, grid code and performance testing laboratories and management in Finland and Italy, give a manufacturing footprint that is easily adjustable to market changes. It is also readily expandable due to a harmonized approach to production and product design in which manufacturability has been already considered from the beginning.





Service

What you need, when you need it, where you need it

Service can play a decisive role in the success or failure of any long-term investment. With many PV installations expected to have a working lifetime over 20 years, fast reliable service for the long-term is a critical consideration.



Industrial experience and expertise

ABB's world-class preventive maintenance programs are based on more than 45 years of extensive knowledge and experience in manufacturing and maintaining power conversion equipment. Our approach to service and life cycle management means that we are well prepared to support our solar PV customers for the years to come.

Life cycle management

Services offered for solar inverters span the entire value chain, from the moment a customer makes the first enquiry to installation and years of successful operation, through the life cycle of the inverter. Throughout the value chain, ABB provides training, technical support, customized contracts and a wide variety of other professional support.

Local presence and support

ABB supports its solar inverter customers with one of the world's most extensive global sales and service networks. Our dedicated service network has operations in more than 60 countries and provides a complete range of life cycle services.

Warranties you can trust

ABB's solar inverter warranty and service offering is carefully configured based on concepts that follow ABB's life cycle management approach. Our offering consists of guarantees with extended warranties, and service contracts complemented with professional technical support featuring rapid availability and response times to assure inverter uptime. The combination of proven supportability over decades rather than just a few years, with minimal TCO (total cost of ownership) when all costs are included, make ABB an excellent choice.



Bankability

Defined



As a sum of many things, bankability can be difficult to define precisely. However, we hope that this presentation has added clarity to the term, both for you as our customer or other party of interest, as well as to the PV solar business as a whole.

Clearly, ABB has an outstanding set of credentials which make it a highly bankable supplier capable

of confidently delivering high-quality products to the solar inverter market. In the end, Bankability comes down to Trustworthiness and ABB is among the world's most trusted companies. When it is time for you to specify equipment for your PV project, this trust should help you to comfortably conclude that ABB is a truly bankable choice in solar inverters.



This is ABB

As one of the world's leading power and automation technology companies, we help our customers to use electrical power efficiently, to increase industrial productivity and to lower environmental impact in a sustainable way.

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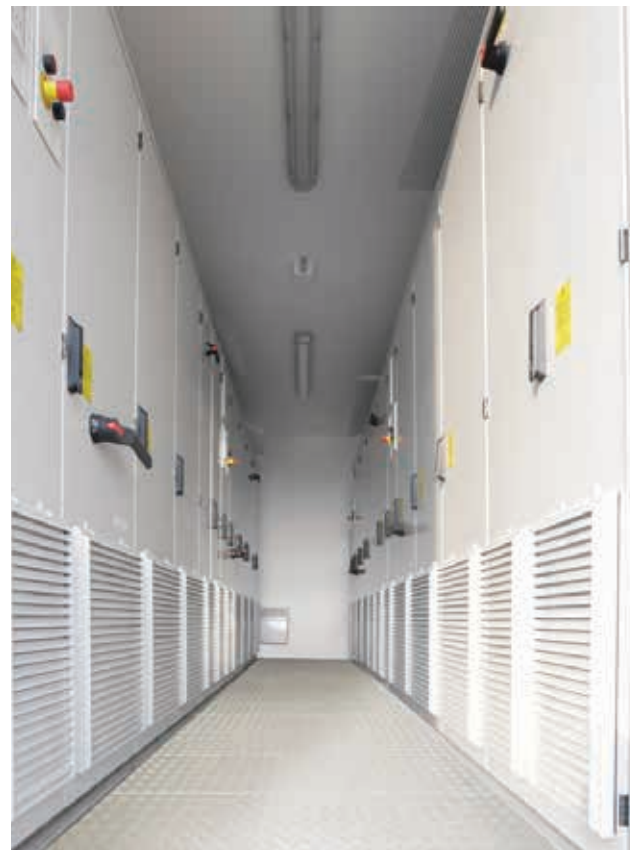
Many of the benefits we take for granted in our daily life, from electricity at the touch of a switch to the consistent high quality of industrial goods, are made possible by technology that was pioneered, improved and adapted by ABB over more than a century of innovation.

Formed in 1988 by the merger of two long-established engineering groups, ABB has about 136,000 employees and operations in more than 100 countries in every region of the world.

Today, ABB is one of the world's leading power and automation technology companies, helping customers to use electrical power effectively and to increase industrial productivity in a sustainable way.

The extremely broad product range from ABB, serving both the solar power industry as well as the general power and automation businesses, gives the company many legs to stand on and is thus a further assurance of bankability.

ABB's operations are organized into four global divisions, which in turn are made up of specific business units focused on particular industries and product categories.



Electrification Products Division

- Medium Voltage Products
- Low Voltage Products and Systems
- Solar Inverters
- UPS and Power Conditioning
- Electric Vehicle Charging Infrastructure

Power Grids Division

- Power Grids
- Semiconductors
- Substations and Electrification
- Substation Automation Protection and Control
- Transformers
- Communication Networks
- Enterprise Software
- FACTS
- High Voltage Products
- HVDC
- Microgrid Solutions

Robotics and Motion Division

- Drives
- Motors and Generators
- Robotics

Industrial Automation Division

- Control Systems
- Measurement Products
- Turbocharging
- Programmable Logic Controllers
- Power Generation
- Oil and Gas
- Marine
- Pulp and Paper
- Mining
- Metals
- Aluminium
- Cement
- Machine & Factory Automation
- Other process industries
- Process Automation Service

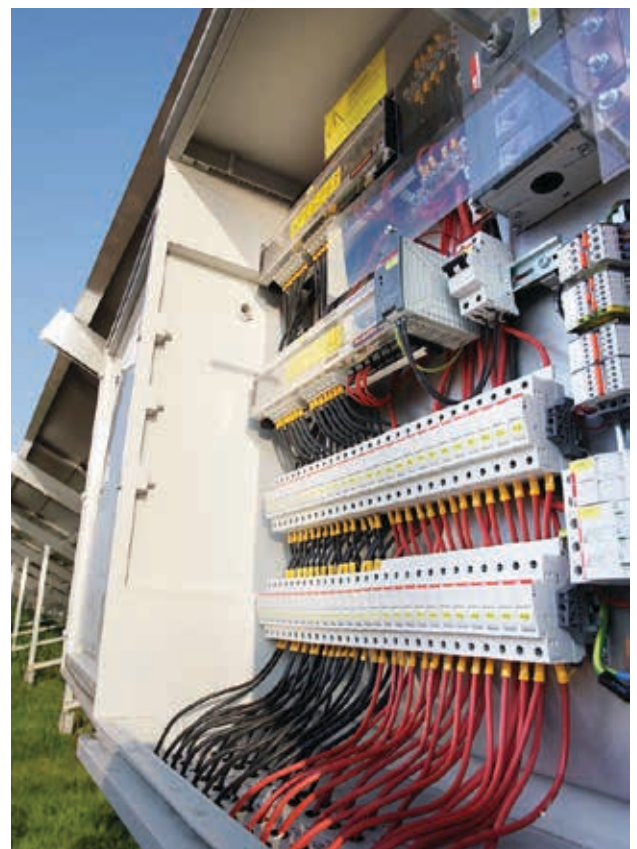


ABB – your trusted solar inverter partner

The size, experience, reputation, financial foundation, and product portfolio are key variables that influence the credibility of any company in the PV sector. As a recognized, global leader in the power and automation technology business, ABB as a company has very strong credentials in all of these categories to fulfill the requirements of a trusted solar inverter partner.

Size of the company and brand reputation

ABB operates in more than 100 countries worldwide and employs around 136,000 co-workers. Our heritage of more than 130 years as a pioneering technological leader, and a long and illustrious record of innovation in numerous industries speak for themselves. Today, the ABB brand is known for quality, performance and innovation.

Financial strength and diversity

In terms of financial strength, the ABB group is very robust, with annual revenues of around \$34 billion in 2016 and R&D investments of more than \$1.3 billion annually. We are a diversified company with four major divisions which are further structured into business units. This diversification means that ABB has a strong financial and technical foundation instead of being concentrated in only one business.

Complete product portfolio for PV market

ABB offers the PV business a complete product portfolio, with the exception of solar modules and module mounting systems. We have one of the widest portfolios of solar inverters ranging from small string inverters up to megawatt-sized central inverters. On top of this, our optimized packaged solutions, world-class plant automation and monitoring systems offering support to meet a variety of project and customer needs.

Global company with local presence

ABB as your partner can support you – our trusted partner – globally, where ever your project is, with expertise and a local presence. Our strong credentials make us a solid, reliable partner. Together we can build a lasting success story for years to come.

Additional information

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