The most efficient PV system concept is the result of varying demands.

What are the determining arguments when deciding on a PV power plant concept? The rule that large and very large PV power plants operate better with central inverters and that smaller power plants operate better with decentralized inverters is not necessarily true. In PV project business worldwide over the past few years, many PV power plants have been built with decentralized architectures, while demand for increasingly more powerful central inverters for these projects has grown steadily. There is no single choice that results in an optimal PV plant concept; instead, a wide range of technical and commercial requirements must be weighed in combination with the client’s highly individual needs. In the end, efficiency is what counts.
Centralized: PV Power Plants Pay Off Through Yields in the Multi-Digit Megawatt Range and Simple Construction

PLANNING AND INSTALLATION
In the planning phase of a centralized PV power plant, the primary focus is on reliable information about the anticipated system performance and whether the PV project is future-proof.

Benefits at a Glance:

- Easy to simulate through use of a model
- Low system price
- Clear and dynamic system performance
- Cost-effective communications network with only a few devices
- Proven technology for plants up to 700 MW
- Higher control dynamics
- Future viability with regard to grid management services
- Standard transport of inverters by truck
- Simple construction

COMMISSIONING
SMA Service can guarantee a simpler and, in particular, faster commissioning process for centralized PV power plant projects because there are fewer inverters in the module field.

OPERATING PHASE
High energy yields, low system costs and future viability are benefits of PV power plant projects with central inverters.

Benefits at a Glance:

- Maximum level of efficiency with low self-consumption enables highest possible yields
- Low transmission losses and multiple connections at a higher voltage level
- Simple monitoring thanks to a manageable number of inverters
- Easy access to individual central inverters
- Plant expansion is exceptionally simple
- Additional revenue from first-level support
Decentralized: PV Power Plants Offer Advantages Over the Entire Life Cycle of the PV Plant

PLANNING AND INSTALLATION
The PV plant’s flexible design possibilities and simple installation are notable advantages of PV projects with a decentralized structure.

Benefits at a Glance:
- Maximum flexibility in plant design with regard to module types and their arrangement
- DC side: installation close to modules with low installation costs
- Low transportation costs
- Easy transportation even in difficult ambient conditions
- Fast installation, many assembly options without additional expense
- Simple construction based on principles of copy and paste

COMMISSIONING
PV power plants with a decentralized structure enable quick installation of the individual string inverters and make good use of the space available by factoring in location specifics.

OPERATING PHASE
A high level of plant availability and quick device replacement when service is required are additional positive aspects of PV power plants with a decentralized structure.

Benefits at a Glance:
- Higher yield due to lower mismatching losses (numerous MPP Trackers)
- Lowest possible operating costs
- Inverter can be replaced quickly, resulting in a high level of plant availability
- Simple disassembly and removal of PV power plant in case of resale
- Remarkably simple options for plant expansion
SMA Offers the Right Solution for Every Need

Lowest system costs, attractive and reliable return on investment, highest energy yields, top quality standards, lowest operating expenditure, both OPEX and CAPEX—all of these are of interest to PV power plant builders and operators as well as investors. These, along with other aspects such as terrain, size and the PV plant’s flexibility, will serve as the basis for the selection on an individual PV power plant concept. With over 30 years of international experience, innovative inverters and system solutions, comprehensive project support and flexible system concepts, SMA always has the most efficient and economical solution, whether for centralized or decentralized configurations.

<table>
<thead>
<tr>
<th>CRITERION</th>
<th>Centralized</th>
<th>Decentralized</th>
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<tbody>
<tr>
<td>1. Specific price</td>
<td>✅</td>
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<td>2. Service costs</td>
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<td>3. Energy yield (efficiency, self-consumption)</td>
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<td>4. Little expertise necessary for planning and installation</td>
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<td>5. Proximity to residential developments</td>
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<td>6. Simple communication concept</td>
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<td>7. Grounding on DC side</td>
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<td>8. No risk from process identifier</td>
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<td>9. High level of availability</td>
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<td>10. Easy to access for roof installations</td>
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<td>11. Control speed</td>
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