

- All-in-one solution for CVD reactors and facilities

# Polysilicon Portfolio

From electrical equipment up to the process control system, Siemens offers a one-stop solution for CVD reactors and facilities.

As energy demand and energy prices rise dramatically, so has the search for energy production from renewable sources. Awareness of the need to reduce CO<sub>2</sub> emissions has only added to the mandate for renewable energy. Experts predict that demand for polycrystalline silicon (polysilicon), used in the production of solar cells, will rise significantly in the coming years.

## Implementing customized solutions

Totally Integrated Automation (TIA) and Totally Integrated Power (TIP) offer numerous benefits: a high degree of standardization shortens the period of time until commissioning, simplifies maintenance,

and reduces expenses. To advance these developments, Siemens collaborates with plant manufacturers, mechanical engineers, and systems integrators. In close cooperation with the customers, Siemens designs custom solutions to make production processes more transparent and reproducible and to enable verifiable documentation of quality standards.

## Subprocesses harmonized

Supported by the Simatic PCS 7 process control system, all subprocesses are harmonized and monitored. Up-to-date asset management, which not only references the core process but also manages performance and equipment, allows customers to see the

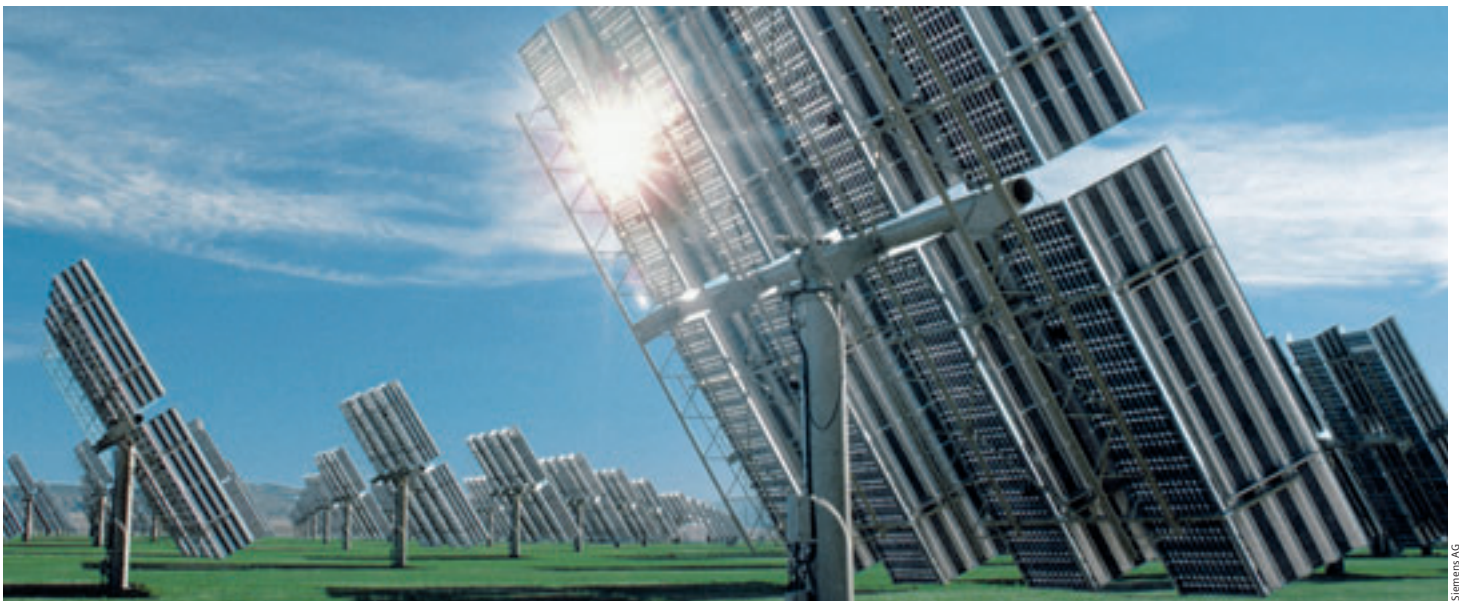
## Simatic PCS 7 semiconductor/ solar library

With the rapidly growing demand for solar power and the demand for increased productivity in solar as well as in semiconductor production, the need for a wide, scalable range of sizes is also increasing. Accordingly, control systems are requested in varying sizes as well. There is also a call to integrate control systems and associated devices, regardless of size or design. Based on proven and established components, the Simatic PCS 7 distributed control system (DCS) offers a solution by including libraries that support task implementation, integration of machines, and even the merging of DCS and Supervisory Control and Data Acquisition (SCADA) worlds. PCS 7 allows the number of interfaces to be reduced by using integrated automation components from a single vendor. This concept integrates all subsystem packages and their varied components into a common database, which allows system changes during runtime. Especially for solar applications, control solutions must be able to incorporate a small controller as well as a complex process control system. They must be able to merge a centralized control system with a distributed one. The solution must integrate a variety of devices into a universal and uniform whole, regardless of system size. The use of field-proven

libraries is an absolute must in this case. It reduces engineering time, generates a uniform system layout, and guarantees safe operation. Therefore, Siemens has developed a semiconductor library usable with PCS 7 that enables the operation and control of all devices such as motors, valves, and PID (proportional-integral-derivative) controllers. This library can also be used for any solar application. The library enables universal reporting, and offers interfaces for central reporting, and acknowledgment. It also allows the data concentrator to be omitted, and in most cases can connect the S7-300 directly to the OS, creating continuity from the PCS 7 to the S7-300 level. An operator panel on a machine can thereby be fully integrated into the system. Different scenarios are conceivable. Package units such as chemicals, cooling, and power supply can be directly integrated or integrated via the Simatic PCS 7, via a data concentrator, or via a central controller if the package units have no controller of their own. Whatever the approach, the semiconductor library will always provide a standardized and universal solution. ■

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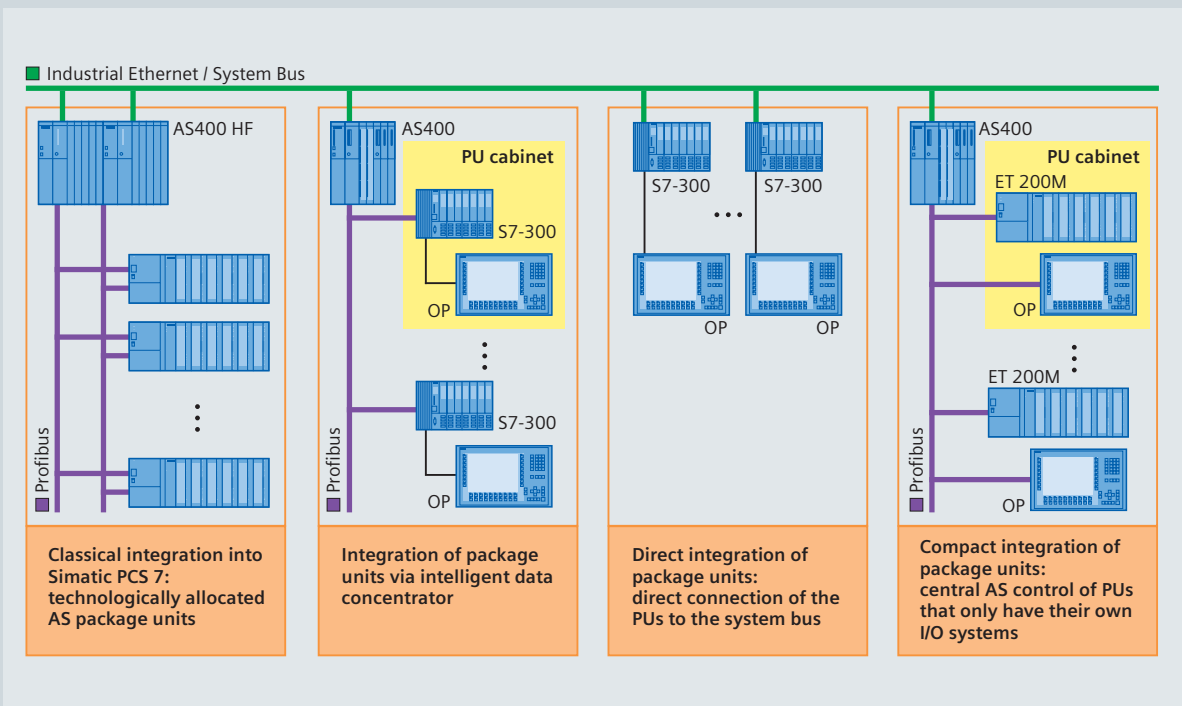
entire “utilization history” of every single investment. Preventive maintenance can also be managed in order to avoid failures. Since Simatic PCS 7 is equipped with a comprehensive industry-specific library of function blocks, it serves as the key system of the polysilicon production process.

### Solutions for communication and CVD reactors

Simatic PCS 7 enables unlimited data exchange on all levels and guarantees central plantwide engineering. The Profibus fieldbus system provides integrated data communication from the field level to the ERP (enterprise resource planning) level, at a high de-

gree of standardization. Siemens’ portfolio also includes complete electrical equipment for CVD reactors. This includes medium-voltage switchgear for the full range of 6 to 24 kilovolts, as well as type-tested and certified busbar systems for the low- and medium-voltage range of 200 to 2,000 volts. These can all be tailored to the individual requirements of the production process. Siemens also offers resin-encapsulated dry-type transformers and integrates thyristor control into production facilities. ■

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Siemens’ semiconductor library allows reduced engineering time while providing scalability, machine integration, and effective task implementation