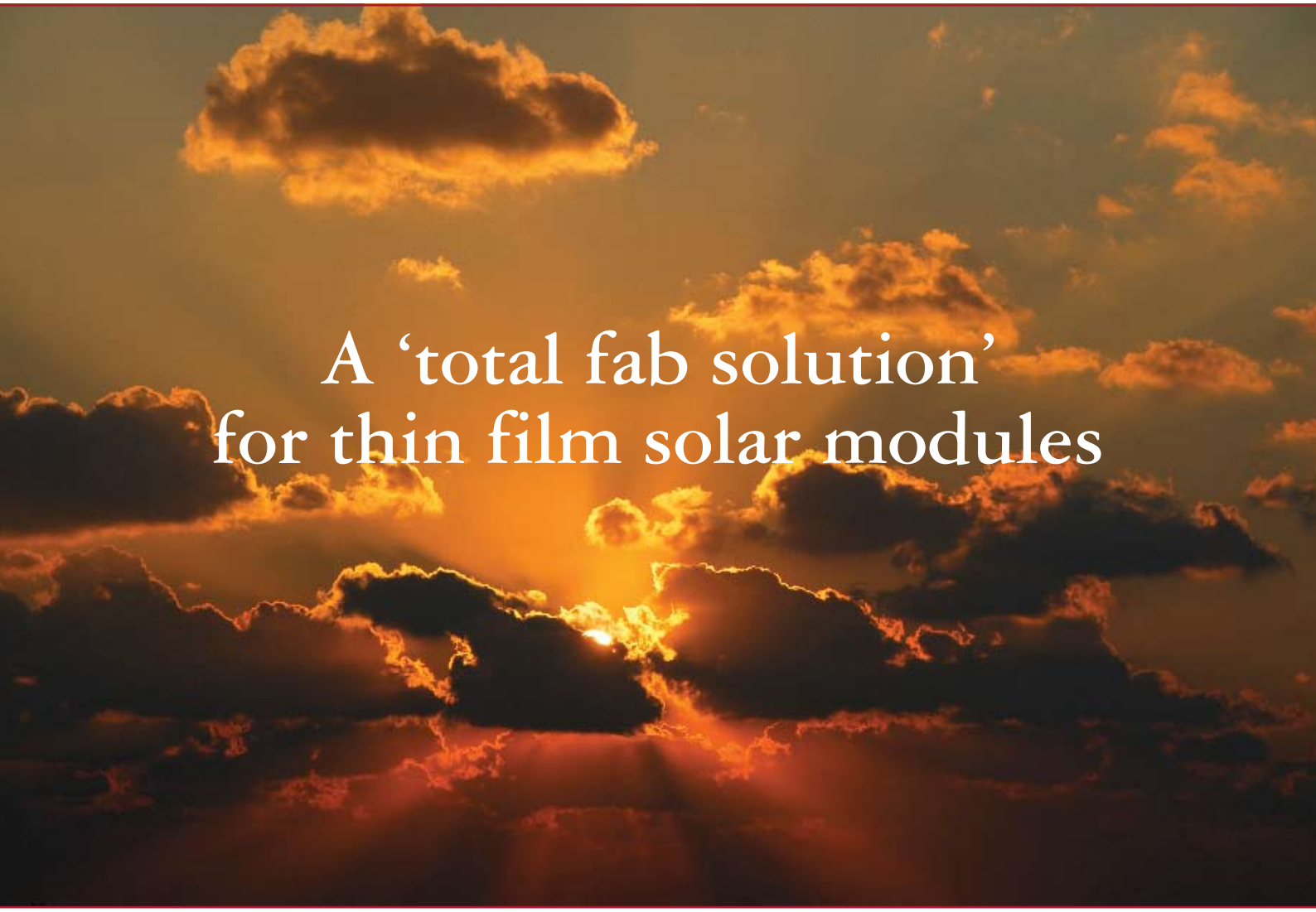

A 'total fab solution' for thin film solar modules

End-to-End (E2E) Fab Solutions for Thin Film Silicon Solar Modules are the latest of Oerlikon Solar's offerings to the solar market. This package – which has been specifically tailored to customers with a turn-key requirement – has generated a lot of interest.

Business growth at Oerlikon Solar continues to exceed all expectations. Founded in 2005, the company has already booked major orders from well-known manufacturers like CSG, SCHOTT Solar, ErSol Thin Film and API. The total production volume of these orders to date exceeds 200 MWp and the new capability to offer tailored E2E mass production solutions for thin film silicon solar modules will add even more potential.

The rapid expansion at Oerlikon Solar reflects the excitement over the potential of this new technology in the global renewable energy market, and adds to the wave of new generation solar plants coming online. Looking at current growth rates over the medium term, the industry is on the verge of producing electricity on a large industrial scale – at prices that will be competitive to energy generated with fossil fuels soon. These new plants are powered by an array of new solar technologies, one of which is based on solar modules with amorphous silicon and "micromorph" tandem cells.

"The fundamental advantage of the Oerlikon production solution is the high productivity combined with very low material cost. Device costs are about 30% lower than conventional solar technology," says Sohaila Kosumdok, Senior Sales & Marketing Manager at Oerlikon Solar. "Compared to conventional solar cells manufactured with crystalline silicon, our thin-film technology uses about 200 times less of this scarce material. And our amorphous silicon is deposited entirely from silan gas."

In fact, all of the materials used in Oerlikon's thin film processes are safe and freely available on the market. The 1.4 m2 glass substrates entering the line are processed in a fully automated production sequence.

Everything you need for module production

Oerlikon Solar's E2E solutions for thin film solar module manufacturing cover the entire value chain from pre-treatment of the glass substrate, thin film coating, to final assembly and module testing. The individual process

Production steps to manufacture Thin Film Si Solar Modules
1) Cleaning (glass substrates)
2) Deposition of Transparent Conductive Oxide layer (TCO)
3) Laser scribing (pattern 1)
4) PECVD deposition of thin film Si (absoption layer)
5) Laser scribing (pattern 2)
6) Deposition of back contact layer
7) Laser scribing (pattern 3)
8) Assembly (contacting, encapsulation and testing)

The KAI 1200 PECVD system from Oerlikon Solar is depositing the complex absorber layer on over 650 glasses of 1.4 m2 per day

steps are modular and can be scaled up in capacity to increase output.

"Micromorph" technology

While amorphous silicon (a-Si) is most cost-effective per square meter of surface area, the "micromorph" tandem cell is able to drastically boost cell efficiency with an auxiliary microcrystalline layer (µC-Si). In addition to absorbing visible light, the tandem cell converts near infrared radiation to electrical energy. An important feature is the compatibility of the production facilities for both amorphous and microcrystalline thin film solar modules; securing the upgrade path to higher cell efficiencies. Micromorph (a-Si/µC-Si) thin film module production systems are currently undergoing industrial trials at Oerlikon Solar and will be available later this year.

"Micromorph will help extend our technology edge," states Sohaila Kosumdok. "With efficiencies 50% above amorphous silicon, a-Si/µC-Si solar modules are approaching conventional crystalline technology – at considerably lower manufacturing costs. Obviously, this is very attractive to both investors and consumers."

Solutions for different clients

For an investor looking to benefit from the solar industry's high growth rates and excellent returns, the promise of a sustainable technology with no geographic boundaries is very attractive. For this segment, Oerlikon provides completely configured production lines, including installation, process integration and a guaranteed production ramp-up. Starting with an annual output of 20 MWp, a client can increase production line capacity by adding additional modules.

"We deal with basically two different customer groups, each with their own sets of needs," explains Sohaila Kosumdok. "On one hand we have the investors, who are focused on implementing a business plan and need someone to take care of the technology part. These are the customers who appreciate our new E2E solution the most. On the other hand, there are the industry people, who already have the technical know-how and operational experience to run a manufacturing line, but need a financial partner. In any case our technical solutions are able to fulfill the needs of both clients."

Ensure your success

"Since our production solution is completely modular, there is no upper limit to production output capacity," adds Sohaila Kosumdok. "Finally, the large material savings and the overall production efficiency of our innovative technology provide the solar module manufacturers with a sustainable cost advantage – and ensure success!" ■

For further information, visit www.oerlikon.com