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Worldwide partnership between Air Liquide and Sixtron for crystalline-Si solar cells

press release

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Air Liquide Electronics

With over 3,000 employees and €872 million revenue in 2009, Air Liquide Electronics has activities in ultra-pure and specialty gases, new molecules, related equipment and customized services.

The Electronics division management is based in Tokyo to enhance its proximity to the semiconductor, TFT-LCD and PV markets in Asia.

The SilexiumTM technology

The technology combines the use of proprietary precursor molecules, together with the Sixtron SunBox gas generation system, to deposit anti-reflective and backside passivation coatings on crystalline silicon solar cells.

The Silexium technology has been qualified by leading industry PECVD tool manufacturers.

These films allow the replacement of existing Silane-based anti-reflective coatings and significantly reduce the Light Induced Defects degradation ("LID") on mono c-Si cells.

Air Liquide and **Sixtron Advanced Materials** announced an **exclusive partnership** to promote and distribute **advanced coating materials** to crystalline silicon ("c-Si") solar cell manufacturers worldwide. This **innovative SilexiumTM technology** will enable crystalline solar panel producers - which today represent around 70% of all photovoltaic manufacturers - to **improve the performance of their solar cells efficiency and reduce costs/Wp** without significant up-front capital investment.

This exclusive agreement will allow **Air Liquide to complement its existing ALOHATM range of advanced precursor materials and propose a new value-adding gas solution to its c-Si photovoltaic customers worldwide.**

Sixtron is a Canadian company whose focus is developing scalable and cost-effective industrial coating systems that improve the performance of solar cells.

The SilexiumTM process solution combines **proprietary precursor molecules** with the **SunBoxTM** gas generation system to deposit new solar cell films.

The agreement will leverage Air Liquide's leading position in the photovoltaic industry supply chain. Manufacturers of c-Si solar cells in more than 20 countries do already benefit from Air Liquide materials management and on-site services infrastructure, enabling them to now rapidly deploy the SilexiumTM technology to mass production.

Francisco Martins, Vice-President World Business Line Electronics of the Air Liquide Group, declared: ***"This global partnership with Sixtron demonstrates Air Liquide strategic interest to provide its photovoltaic customers with the safest, most advanced and lowest cost-of-ownership Gases & Precursors solutions in the market. The photovoltaic market is at the crossroads of Energy and the Environment, two growth drivers of the Air Liquide group."***

Peter Tyszewicz, President and CEO of Sixtron, said: ***"Air Liquide's number one market position will allow Sixtron to support the crystalline-Silicon solar industry as it improves cell efficiency and reduces costs."***

The use of gases in the photovoltaic industry

Gases are used at all stages of solar cells manufacturing process:

- to produce Poly-Silicium: high-volume of nitrogen (N₂) and hydrogen (H₂)
- to produce Si wafers: large quantities of nitrogen, argon (Ar) and helium (He)
- to produce crystalline-Si cells: carrier gas (N₂) & specialty gases such as silane (SiH₄), ammonia (NH₃), doping gases/chemicals (POCl₃), and coating precursor materials
- to produce Si Thin Film cells: carrier gases (N₂, H₂), specialty gases (SiH₄, NF₃, dopant mixtures) and coating precursor materials.

Air Liquide is the world leader in gases for industry, health and the environment, and is present in over **75 countries** with **42,300 employees**. Oxygen, nitrogen, hydrogen and rare gases have been at the core of Air Liquide's activities since its creation in 1902. Using these molecules, Air Liquide continuously reinvents its business, anticipating the needs of current and future markets. The Group innovates to enable progress, to achieve dynamic growth and a consistent performance.

Innovative technologies that curb polluting emissions, lower industry's energy use, recover and reuse natural resources or develop the energies of tomorrow, such as hydrogen, biofuels or photovoltaic energy... Oxygen for hospitals, homecare, fighting nosocomial infections... Air Liquide combines many products and technologies to develop valuable applications and services not only for its customers but also for society.

A partner for the long term, Air Liquide relies on employee commitment, customer trust and shareholder support to pursue its vision of sustainable, competitive growth. The **diversity** of Air Liquide's teams, businesses, markets and geographic presence provides a solid and sustainable base for its development and strengthens its ability to push back its own limits, conquer new territories and build its future.

Air Liquide explores the best that air can offer to preserve life, staying true to its sustainable development approach. In 2009, the Group's revenues amounted to **€12 billion**, of which almost 80% were generated outside France. Air Liquide is listed on the Paris Euronext stock exchange (compartment A) and is a member of the CAC 40 and Dow Jones Euro Stoxx 50 indexes.