



Air Liquide Electronics signs two major contracts with China's leading display manufacturer

Air Liquide to supply BOE's two new factories

press release

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Air Liquide Electronics

With over **3,500 employees** and **€1,222 million of revenue in 2012**, Air Liquide Electronics has activities in ultra-pure carrier and specialty gases, new molecules, related equipment and customized services.

The Electronics division management is based in Asia to enhance its proximity to the markets for semiconductors, flat panel displays and solar photovoltaics.

Flat Panel Technologies

TFT-LCD (Thin Film Transistor – Liquide Crystal Display) relies on liquid crystal to control light transmission at sub-pixel level.

LTPS (Low Temperature Poly-Silicon) and **Oxide-TFT** are highly conductive materials, such as alloys of **Indium Gallium Zinc Oxide** allowing the production of smaller TFTs for high-definition screens.

AMOLED refers to the use of **Active TFT Matrix** arrays, here made of LTPS or Oxide-TFT, to control each OLED sub-pixel light emission.

Gen8.5 indicates the size of the mother glass substrate used to produce the panels, here it is 5.5 m².

The worldwide demand for **next-generation flat panel displays** is booming, driven by the increasing popularity of smart phones and tablets as well as ultra-high-definition screens. China has now become **the largest consumer market for electronics goods** in the world. In the recent years, several manufacturers have built state-of-the-art flat panel display *fabs* to meet local and overseas demand.

Air Liquide has been **awarded two major long-term contracts** by **BOE Technology Group in China**, to supply ultra-pure carrier molecules to its **two latest cutting-edge flat panel display fabs**. These plants will both manufacture large numbers of advanced flat panel displays. The first plant (called BOE Ordos G5.5 AMOLED fab) will be based in **Ordos**, Inner-Mongolia and the other plant (called BOE Hefei G8.5 TFT-LCD fab) in **Hefei**, Anhui province.

These contracts are the **20th and 21st long-term supply agreements** signed by **Air Liquide Group in the flat panel display industry in Asia**. The total ultra-pure nitrogen newly-contracted will amount to **50,000 Nm³/h**. This is **the largest investment** ever made by Air Liquide in China for a client in this sector.

The new **BOE fab in Ordos** will be commissioned in **late 2013**, and will produce small and medium-sized advanced LTPS & AMOLED displays for mobile devices on Generation 5.5 size glasses. Air Liquide will invest in a **large on-site generator** to produce **ultra-high purity nitrogen** and in **bulk gases (oxygen, argon and hydrogen)** supply infrastructure.

For the **BOE fab in Hefei**, located near the BOE Hefei G6 *fab* already supplied by Air Liquide, those same molecules will be supplied **by pipeline from Air Liquide facilities**, located in Hefei. This *fab* will be commissioned in **early 2014** and will produce displays on Generation 8.5 size glasses. Air Liquide will also invest in the necessary back-up infrastructure for both sites.

Founded in 1993, BOE has become **the largest flat panel display manufacturer in China**. It also holds more than 9,000 applicable patents and ranks fifth in term of shipment around the world.

Mr. Liu Xiaodong, Chief Operating Officer of BOE Technology group, commented: ***“We are pleased to have selected Air Liquide as our partner for our new projects in Hefei and in Ordos. Air Liquide has shown a strong understanding of our needs and offered us competitive solutions that will provide good value for our operations. We look forward to a long and fruitful partnership with Air Liquide and to benefiting from its worldwide capabilities.”***

The use of molecules in flat panel industries

High-purity gases are used to manufacture Thin Film Transistors (TFT), which lie at the heart of FPD technologies: the main role of nitrogen (N₂) is to ensure a clean process environment. Electronics Specialty Gases (ESGs), along with other carrier gases, are used either to deposit, clean or functionalize the material layers that constitute the TFT.

Air Liquide in China

Operates more than **60 plants** and employs about **4,000 people today, with a presence in the key coastal industrial areas**, and is further expanding into the western and the northeastern China.

Air Liquide has also strong **Engineering and Construction capabilities** through Air Liquide Hangzhou and Lurgi.

Air Liquide returned to supply air separation units in the 1970s and restarted gas operations in 1990.

Jean-Marc de Royere, Asia Pacific Vice President and member of the Air Liquide Executive Committee, said: **“We are honored by this long-term partnership and the confidence placed in Air Liquide by BOE for their latest cutting-edge display fabs. These new contracts, following those signed by Air Liquide to supply BOE sites in Beijing (G5 fab), in Chengdu (G4.5 fab) and in Hefei (G6 fab), reinforce our position in the fast-growing flat panel industry in China and advanced display technologies in Asia, and affirm the value and competitiveness of our offer.”**

Air Liquide is the world leader in gases for industry, health and the environment, and is present in **80 countries with close to 50,000 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 for the good of society while delivering growth and 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, home healthcare, 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 Corporate Social Responsibility and sustainable development approach. In 2012, the Group's revenues amounted to **€ 15.3 billion** of which 82% 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.