Tallest Elevator Testing Tower to be Built in China

SHANGHAI, China—Elevator manufacturer Otis plans to build the world’s tallest elevator testing tower in Shanghai, China. The elevator test tower will be 270 m (886 ft) tall upon completion, which the company says will make it the tallest aboveground test tower in the world. The test tower will be part of Otis’ new global research and development facility, which is scheduled to be operational by the end of 2018. The tower is designed with a flexible configuration to easily adapt to test new components and systems as they evolve. The company has provided elevators for some of the world’s most famous high-rise buildings, such as the world’s tallest building, the Burj Khalifa in Dubai.

Dubai Plans Skyscraper Taller Than Burj Khalifa

DUBAI, United Arab Emirates—The developer of Burj Khalifa, the world’s tallest building, is planning to build an even taller tower in Dubai. Burj Khalifa is 828 m (2,700 ft). Mohamed Alabbar, chairman of Emaar Properties, said the final height would be announced upon completion, but will be “a notch” taller than Burj Khalifa. He added that his company would like to present the tower as a “gift to the city before 2020.” The new structure will be bedecked with rotating balconies and elevated landscaping inspired by the mythical hanging gardens of Babylon.

The tower will have observation decks and 18 to 20 mixed-use floors that will house restaurants and a boutique hotel.

Trane Expands Chiller Portfolio

DAVIDSON, N.C.—Trane is expanding its CenTraVac™ centrifugal chiller portfolio for large buildings and industrial applications in the United States and Canada, the company said.

In 2017, Trane will offer small-tonnage CenTraVac chillers for markets like office and municipal buildings with a choice of current, high-efficiency refrigerant R-123 or the next-generation R-514A. R-514A is a low-global warming potential (GWP) refrigerant from Chemours (Opteon™ XP30).

Starting now, Trane offers large tonnage CenTraVac chillers for applications such as industrial buildings, data centers, and higher education facilities with the low-GWP refrigerant R-123zd (Honeywell Solstice® zd).

Trane CenTraVac chillers are part of the Ingersoll Rand EcoWise™ portfolio of products designed to lower environmental impact with next-generation, low-GWP refrigerants and high-efficiency operation.

“We are pleased to bring our customers new choices for achieving their building, business, and sustainability goals without compromising safety, performance, or efficiency,” said Dave Regnery, president of Ingersoll Rand’s Commercial HVAC business for North America, Europe, Middle East and Africa. “We paired our technical and applications expertise with new refrigerant and service offerings to deliver efficiency and reliability that customers expect.”

“We’re on a journey,” Regnery said in an interview after the company announcement. The company “is pushing the envelope” in providing options that he said are in high demand with customers.

Latest CBECs Tables, Microdata Released

WASHINGTON, D.C.—The U.S. Energy Information Administration (EIA) has released the most recent Commercial Buildings Energy Consumption Survey (CBECs) consumption and expenditures detailed tables and public use microdata. The 2012 CBECs consumption and expenditures detailed tables cover overall electricity, natural gas, fuel oil and district heat consumption, and disaggregate the same energy sources by end use (heating, cooling, lighting, etc.).

The 2012 CBECs microdata files now contain additional variables for energy consumption and expenditures, in total, by energy source, and by end use. The files contain untabulated records for 6,720 commercial buildings, so data users can create custom tables not available through the pretabulated detailed tables. They represent commercial buildings from all 50 states and the District of Columbia.

Rendering of Otis test tower and global research and development center in Shanghai, China, scheduled for completion in 2018.
Advances in 3-D Printing

Prototype 3-D Printed, 150 lb Turbine Could Replace Machines Weighing Tons

ALBANY, N.Y.—GE Global Research is testing a desk-size turbine that could potentially provide power to about 10,000 homes. The unit is driven by supercritical carbon dioxide, which is in a state that at very high pressure and up to 700°C (13,000°F) exists as neither a liquid nor a gas. After the carbon dioxide passes through the turbine, it’s cooled and then pressurized before returning for another pass. The unit’s compact size and ability to turn on and off rapidly could make it useful in grid storage. It’s about one-tenth the size of a steam turbine of comparable output, and has the potential to be 50% efficient at turning heat into electricity. Steam-based systems are typically in the mid-40% range; the improvement is achieved because of the better heat-transfer properties and reduced need for compression in a system that uses supercritical carbon dioxide compared to one that uses steam. The GE prototype is 10 MW, but the company hopes to scale it to 33 MW.

Dubai Opens ‘World’s First Functioning 3-D-Printed Office Building’

DUBAI, United Arab Emirates—What is being touted as the “world’s first functioning 3-D-printed office building” opened in Dubai. The 2,700 ft² (251 m²), single-story building was built in only 17 days using a 20 ft (6 m) tall, 120 ft (37 m) long and 40 ft (12 m) wide 3-D printer. The “printing” material was a mix of concrete, fiber-reinforced plastic and glass-fiber-reinforced gypsum. The printer only required one staffer to make sure it was functioning properly. The rest of the 18-person construction crew consisted of installers, electricians and mechanical engineers. The arc-shaped office, which cost about $140,000, will be the temporary headquarters of Dubai Future Foundation, the company behind the project. Mohamed Al Gergawi, the United Arab Emirates Minister of Cabinet Affairs, says the technique could cut building time by 50% to 70% and labor costs by 50% to 80%. He added that Dubai plans to have 25% of its buildings be 3-D printed by 2030.

Award-Winning Design for 3-D-Printed House Set for Construction

CHATTANOOGA, Tenn.—A U.S. architecture firm has designed a house made of 3-D-printed plastic and carbon-fiber panels wrapped around glazed walls. The design earned WATG’s Urban Architecture Studio first prize in the Freeform Home Design Challenge, which invited architects, designers, engineers and artists to propose a 3-D-printed dwelling. The project—called Curve Appeal—consists of a curvaceous, arching structure made up of panels that create an exterior skin and an interior core. These are combined to form the roof and large portions of the façade. Competition organizer Branch Technology, a U.S.-based construction company, has developed a mix of plastic and carbon fiber that can be 3-D printed into a “self-supporting cellular matrix.” According to the design team, “The initial design surfaces of the house will be broken down and optimized for printing the 3-D cellular matrix. These portions will be aggregated together to form a singular cohesive structure.” Expanding spray foam and concrete will then be added for strength. The design is for a single-family home between 600 ft² and 800 ft² (56 m² and 74 m²). Construction will begin in 2017.
Wealth, Warm Climates Driving Worldwide AC Boom

WASHINGTON, D.C.—In many countries, air conditioning is still a relative rarity. However, as these countries boom in wealth and population, more countries will become similar to the United States in their dependence on AC.

According to a recent report by the University of California, Berkeley, 700 million air conditioners will be installed by 2030, and 1.6 billion of them by 2050.

In terms of electricity use and greenhouse gas emissions, it is the equivalent of adding several new countries to the world.

That trend is already under way. China now averages more than one room air conditioner per urban household. Also, air-conditioner sales are now increasing in India, Indonesia and Brazil by between 10% and 15% per year.

Prototype Clothes Dryer Uses Sound, Not Heat

OAK RIDGE, Tenn.—The U.S. Department of Energy’s Oak Ridge National Laboratory has developed a new type of clothes dryer that uses sound waves to vibrate clothes dry rather than heating them.

Evaporating the water in clothes is energy-intensive and expensive. The vibrations still require energy to create, but much less than conventional heating. “You’re drying it as it’s cold,” said lead researcher Ayyoub Momen, Ph.D., Member ASHRAE.

Momen’s invention was inspired by an ultrasonic humidifier. “I saw how much cold mist it can generate with just a little bit of energy, and that rang a bell for me,” he said. The prototype technology is estimated to be three to five times more efficient than a typical dryer, and take only half as long to dry a load of clothes.

Companies Build Mobile Modular Data Center

SHENZHEN, China—Two Chinese technology conglomerates have partnered to create an energy-efficient data center that benefits from solar power.

The mobile containerized data center known as the Tencent West Lab uses indirect evaporative free cooling to lower its electricity consumption. According to manufacturer ZTE, it is a first for an enterprise data center in China. ZTE and partner Tencent say the data center has a power usage effectiveness (PUE) rating of only 1.0665.

According to ZTE, the majority of China’s data centers have a PUE rating higher than 2.2, and the global average is around 1.7.

The facility combines high-voltage direct current and grid electricity for power supply, and in-row cooling (instead of raised-floor cooling) along with cold-aisle containment to achieve its low PUE despite being in a subtropical climate.

Challenge Results In Energy Use Reductions

WASHINGTON, D.C.—Partner companies and municipalities involved with the U.S. Department of Energy’s Better Buildings Challenge have achieved energy cost savings that exceed $1.3 billion, and have avoided 10 million tons of harmful carbon emissions, according to DOE.

There are now 310 Better Buildings Challenge partners, representing 34,000 buildings and facilities and 4.2 billion ft² (390 million m²) of building space. DOE says that 35 partners have achieved their 2016 Challenge energy or water savings goals ahead of schedule. Partners in the Challenge follow strategies and solutions recommended by the program.

PG&E Proposes Pay-for-Performance Program

SAN FRANCISCO—West Coast utility Pacific Gas & Electric (PG&E) recently submitted plans for a residential pay-for-performance program that some observers say has the potential to shape the way energy efficiency is monetized and delivered to market.

In its proposal to the California Public Utilities Commission (CPUC), PG&E describes a residential pay-for-performance pilot that uses newly available and standardized energy and project data, combined with open-source standard methods, to calculate savings. Therefore, energy conservation incentives would be awarded based on actual measurements from individual meters rather than upfront estimates or models.

Danfoss Unveils Components for Low-GWP Refrigerants

SAN FRANCISCO—Danfoss announced its commitment in June to help speed the adoption of energy-efficient HVAC&R equipment by providing a comprehensive portfolio of components for low-GWP (global warming potential)
WASHINGTON, D.C.—The U.S. Environmental Protection Agency (EPA) recently proposed additional reductions in the use of hydrofluorocarbons (HFCs). The “new proposal would reduce the use and emissions of some of the most harmful HFCs, which are thousands of times more potent than carbon dioxide, and approve safer, more climate-friendly alternatives,” said EPA Administrator Gina McCarthy. Under the proposal, propane and HFO-1234yf are listed as acceptable “in specific end uses in the refrigeration and air-conditioning sector.”

Also, flammable hydrocarbon (HC) refrigerants and HC blends are listed as unacceptable “for retrofitting existing residential central air-conditioning equipment that was designed for nonflammable refrigerants.” In addition, propylene and the HC blend R-443A are listed as unacceptable “in specific end uses in the refrigeration and air-conditioning sector.”

Seventh Clean Energy Ministerial (CEM7) and inaugural Mission Innovation (MI) Ministerial in San Francisco. The AC Campaign challenges governments and industry to develop and deploy at scale super-efficient, smart, climate-friendly, and affordable cooling technologies critical for prosperous and healthy societies, furthering the goals of the Montreal Protocol.

The commitment came shortly after Danfoss held its 26th EnVisioneering Symposium, “Tomorrow’s Buildings: New Driving Forces,” featuring over 40 participants in Washington. Representatives from the federal government, manufacturers, non-government organizations, universities and the media attended.

EPA Proposes Restrictions on HFCs Alternatives

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