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SPECIAL ISSUE

50-year Roadmap for Energy Development

China will work on a 50-year roadmap for its energy development, in an attempt to establish a sustainable energy development system, and realize an optimized energy composition, said LU Yongxiang, President of the Chinese Academy of Sciences at a forum on sustainable energy development held on September 19, 2007.

The roadmap will touch an array of important issues to be addressed in the near term through 2020, including energy efficient and clean energy technologies, energy efficiency enhancement technologies, new generation zero emissions, IGCC, pressurized fluidized bed combustion-combined cycle, CO^2 capture, key technologies for storage and utilization, efficient coal liquefaction, pilot and large scale applications of coal based ethanol and olefin substitutes, clean and safe nuclear energy, and non-water renewable energy, and visionary non-traditional fossil fuel energy.

In the medium term context around 2030, China will make nuclear energy and renewable energy a major energy source. China will also strive for breakthroughs in the following areas: fast neutron reactor technology and associated commercial applications, effective utilization and safe handling of nuclear materials, efficient solar energy conversion and associated commercial applications, effective conversion of biomass optical properties, biological conversion of agricultural wastes, cellulose, and semi-cellulose, and associated commercial applications, intelligent energy grid, and hydrogen energy.

In the long term context around 2050, China will complete the establishment of a sustainable energy system that basically meets the energy needs of the nation' s economic and social development. By that time, China' s dependence on fossil fuel energy will drop to 60% or less, with renewable energy becoming a dominant energy. Focus will be on the development of scale and commercial applications of renewable energy, and breakthroughs in nuclear fusion energy technology.

LU said that China will adopt effective measures to facilitate the sustainable energy development, including establishing special projects for large scale non-water renewable energy applications, establishing an advanced nuclear energy system focusing on fast neutron reactor and nuclear fuel cycling, ensuring a rational energy composition and sufficient energy supply for the country around 2050.

INTERNATIONAL COOPERATION

China-France Strategic S&T Partnership

WAN Gang, Chinese Minister of Science and Technology, and Mme Valérie Pécresse, French Minister of Higher Education and Research inked on September 18 a joint statement on fostering a strategic S&T partnership between China and France. The statement says both sides want to develop a partnership that is built on mutual benefit and win-win basis, with a common wish to strengthen bilateral cooperation in the area. It adds that both side expressed their satisfaction to the recent accomplishments made though the collaborations between the two countries, especially in exchanges of S&T personnel. Taking into account the potentials of further cooperation, and the fact that S&T cooperation is an important part of the partnership between the two countries, both sides agree to continue and strengthen cooperation in the area.

New Resources Satellite Launched

At 11:26, September 19, 2007, China successfully blasted off the third Resource I satellite aboard a CZIVB launch vehicle, from the Taiyuan Launch Center. The satellite, jointly developed by China and Brazil, was separated from the carrier rocket 12 minutes after ignition. It entered a solar synchronous orbit with a perigee altitude of 738 kilometers, an apogee altitude of 750 kilometers, and an obliquity of 98.5 degrees.

The new satellite system is jointly developed by China Academy of Space Technology and Brazil Academy of Space Research. With a weight of 1,452 kilograms, and a designed life for 2 years, the tri-axis stability system is an earth resources satellite provides a global coverage. Equipped with an array of advanced payloads, including multi-spectrum CCD camera, high resolution camera, wide field imager, space environment monitoring system, and data collection and transmission system, the new satellite can transmit visible and multi-spectrum remote sensing images to China, Brazil, and to any other countries having a reception capability. The data derived from the satellite can be widely used for crop yield estimation, environmental protection and surveillance, urban planning, and land resources survey.

Alpine Expedition Completed

Thanks to their 4-year painstaking efforts, a China-Russia scientific expedition team has recently completed its joint survey on the Altai Mount. a demarcation range between the two countries. The expedition, first of its kind jointly conducted by the scientists of two countries, has investigated the ecological environment of the mountain, from the shallow mountain area and associated plains on the Chinese side, to the Siberian plains on the Russian side. Researchers also investigated the plants grown in the mountains.

According to a briefing, the joint expedition ended up in July has traveled some 1,000 kilometers, covering the Na ‘ersen Mountain in Yili, Xinjiang in the west, and alpine plants across the Altai Mount. in Qinghe County, Altai Prefecture in the east. The survey mainly targeted the alpine plant belts 2000m above the sea level within the Chinese border. Researchers have studied the lower plants, wetland plants, and woody plants across the Mountain.

Chinese and Russian experts have collected some 20,000 plant specimens, and discovered two new newly recorded Chinese genuses, 22 newly recorded Chinese species, and 8 newly recorded Russian species. Researchers have published 3 papers in international or domestic journals, and are currently working on a name list for the plants in Chinese Altai Mountain.

RESEARCH AND DEVELOPMENT

FY-3 Satellite Completed Payload Test

An aircraft lifted up on September 15, 2007 to conduct a payload test for FY-3 satellite over the Qinghai lake, where it took observation along with 5 ground teams. The aircraft has successfully completed the payload calibration mission for the new satellite to be launched in the near future.

According to a briefing, the mission is necessary for calibrating the instruments aboard the satellite, before the launch, in an attempt to collect useful experimental data and ensure a scientific accuracy of all the instruments onboard. The aircraft that implemented the mission is a remodeled Yun-8 Chinese made aircraft, with three Chinese made payloads aboard, including a moderate resolution imaging spectroradiometer, Microwave Humidity Sounder, and Microwave Temperature Sounder. Researchers will make the data collected from the ground observing station and aircraft simulation data for ground applications.

FY-3 weather satellite is China ‘s second generation polar orbiting meteorological satellite that will be launched at the end of the year. It will collect a range of remote sensing data, including temperature, humidity, air pressure, clouds, and radiation, through global, all-weather, 3-D, multi-spectrum, and quantitative means. It will provide effective service for weather forecast, climate prediction, and environment monitoring.

IC Chip for Plasma Display Panel

In collaboration with researchers of Hangzhou Shilan, a study team, led by Prof. HAN Yan of Zhejiang University, has recently rolled out an IC chip that drives digital Plasma Display Panel (PDP), after three-year efforts. The new product has found solutions to a number of technical difficulties, including the compatibility between special high pressure components and low pressure control circuit, allowing sufficient driving power for Plasma Display Panel. The successful development of the new chip has led to the birth a proprietary 2.5um170V BCD production line at Hangzhou Shilan.

The study team is currently working on an 80V driving chip for Plasma Display Panel, so as to make a product line along with the above mentioned chips.

Novel Photovoltaic System

A 205kw desert power generation station, equipped with 1344 novel photovoltaic units, was recently put into operation in Erduosi City in Inner Mongolia. Developed by a team led by Prof. CHEN Yingtian of the University of Science and Technology of China, the new system has a photovoltaic board that is made up of a photovoltaic funnel of 8 reflectors and regular monocrystalline silicon photovoltaic cells. Led by a single IC, the photovoltaic funnel is not only able to track down and absorb sun light on its own, but is also able to focus sun light to the photovoltaic cells at the bottom, which improves the efficiency of photovoltaic cells.

It takes some RMB 9 million to build a novel photovoltaic power station, or 75% of the cost to build a similar power station with traditional flat board. The new system produces some 240,000 kilowatt hours of electricity annually, or three to four times the power generated by a flat board system. The new system has eliminated the heat-island effect that cannot be avoided in a flat board system, which prolongs the life of cell board. Two-year field experiment shows that the new system is resistant to wind and sand, and to shock as well.

Successful Expedition across Kumutage Deserts

Successful Expedition across Kumutage Deserts

Two Chinese expedition teams have successfully joined together on September 17, 2007 in the southern part of the Kumutage Deserts. The event marks the first instance of a successful crossing of the desert by Chinese researchers who are equipped with modern technologies, and the realization of a dream for such crossing by three generations of desert scientists.

The expedition team headed for the desert from the Dunhuang City, Gansu Province on September 10. Researchers traveled through the desert while conducting scientific investigations. In seven days, they have encountered 2 sand storms. Their vehicles have traveled a mileage of 1500 kilometers, as the result of tough terrains of the desert.

As of September 17, 2007, the geological group has basically completed its survey of the desert, and unveiled the mysterious huge sand sources for the desert. The relief group has worked out the genesis mechanism of feather shaped sand dunes, the only existence in China. It also discovered two grand canyons in the deserts, and a rare spring well in K1 canyon. Animal and plant group has investigated the fauna and flora species across the desert, and discovered the sand born plants that are desirable for sand control. Meteorological group has installed 2 automatic weather stations that can transmit data via satellite, and 4 automatic wind measuring instruments. These instruments will provide valuable data for studying the temperature, wind direction, and wind speed in the desert. So far the expedition team has collected some 150 sand specimens, and more than 120 soil specimens, in addition to 20 plant specimens. The expedition will wind up its scientific missions around September 25, 2007.

New GM Corn for Less Pollution

The Chinese Academy of Agricultural Sciences announced on September 10, 2007 that it has developed a new GM corn rich in phytase. The new corn helps stocks to digest phosphorus, and enhances the nutritional value of feeds, which in turn reduces the pollution. The new GM corn has been grown over an extensive area, though for experimental purpose.

Researchers separated a gene able to produce phytase from bacteria, and inserted it into the corn. After 7-year reproduction cycles, researchers eventually obtained a GM corn with stable phytase properties. Compared with traditional corns, the new species tells no differences in seedling, growth rate, and yield. Under the prevailing standard, only by adding several grams of new GM corn in one kilogram of corn feeds can satisfy cattle’ s nutritional needs for phosphorus.

NEWS BRIEFS

Chinese Robot Attracts Limelight in US Shows

An electronics show opened on September 13, 2007 in Los Angeles Conference Center. A Chinese robot, made of silicon rubber, has become a limelight attracting the attention of both local media and visitors.

The high tech show has gathered some 160 displays developed by renowned manufacturers or research institutes across the world, covering numerous areas, including telecommunication, design, entertainment, health, robot, transport, security, and green life.

At the China counter, ZOU Renti, President of Xi’ an Sculpture Institute sat together with a robot that looks exactly like him. The scene attracted many visitors. The robot, bearing a look extremely like a real man, is produced using advanced silicon rubber shaping technique and modern technologies. It has a skin not only looking real, but is also elastic. The robot can perform different actions, including eye ball rolling, shaking head, and speaking. It talked to ZOU occasionally, and made a self introduction in both Chinese and English. Some audiences appalled that sometimes they really could not tell the real from the copy.

ZOU told reporters that the robot has been selected by *Times* magazine a most creative invention in 2006, which highlights the accomplishments made by Chinese researchers in the area. He and his colleagues want to learn more from this show, in an attempt to bring out more and better products.

World Largest Metal Glass

A team, led by Prof. JIANG Jianzhong of Zhejiang University International New Structural Materials Research Center, has rolled out a rare earth based metal glass material with a diameter of 35 mm, the largest of its kind in the world. The metal glass enjoys both strong glass shaping property and very low temperature demand for glass transformation, which means the glass can be reshaped under a low temperature. For example, it can be stretched, or folded in a 100℃hot water. The finding will be reported in the October 2007 issue of journal *Materials Today*.

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