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IN THIS ISSUE

*Enhanced Comprehensive Utilization of Resources
*Home Software and Hardware for Information Platforms
* Digital Supersonic Wind Tunnel
*Zero Emission Desulfurization
* China Discovers CYLD Genes

SPECIAL ISSUES

Enhanced Comprehensive Utilization of Resources

China's major indicators for comprehensive utilization of resources have been raised, according to a document publicized recently by the State Development and Reform Commission to provide guidance for the comprehensive utilization of resources in the 11th Five-year period (2006-2010). It predicts that by 2010, China's recovery of mineral resources and comprehensive utilization of coexisting and accompanying mineral resources will enjoy an increase by 5% on the basis of 2005, hitting 35% and 40% respectively. Comprehensive utilization of industrial solid wastes will reach 60%, of which coal dust will be at 75%, and gangue 70%. China's recovery and utilization of major renewable resources will also ascend to 65%, with an enhanced comprehensive utilization of timbers from the current 60% to 70%.

It also predicts that by 2010, the enhanced comprehensive utilization of mineral resources will add more wealth to the country, including 250 million tons of coal, 3.25 billion cubic meters of coalbed gas, and 7 million tons of petroleum. Of the added utilities, 5 million tons will be derived from low-grade reserves, 1 million tons from residues, and 1 million tons for non-regular oil shale. According to the document, China improving its comprehensive utilization of solid wastes by one percent will lead to an annual emission reduction of wastes by 10 million tons. The same level improvement for coal dust may result in a coal dust emission reduction by some 2 million tons, extremely desirable for improving the environmental quality.

In this context, the document lines up a range of priority areas, including comprehensive utilization of scarce resources, strategic resources, and precious resources; efficient utilization of the wastes featured with large emission and inventory, and having great potentials to become resources; establishing a recovering system for renewable resources; and raising the overall level of the renewable resource industry. Six major projects will be initiated to set up role models for the industry, including comprehensive utilization of coexisting and accompanying mineral resources, resources oriented utilization of bulk solid wastes, industrialization of renewable metal processing, resources oriented utilization of used electric appliances and tyres, renewable resources recovering system, and comprehensive utilization of agricultural wastes and timbers.

The document also produces an array of proposals, in an attempt to ensure the faithful implementation, including making resources efficiency a basic state policy, and allowing the development of cyclic economy to be part of development strategy, planning, industrial policies, investment management, financing, taxation, banking, and pricing. It defines the implementation in six steps: 1) strengthening the capacity building of the system, and promoting governance by law; 2) enhancing planning and guidance, and implementing key projects; 3) perfecting incentive policies, and striving for a solid implementation of the policies; 4) enhancing technological innovations, and promoting advances in technology; 5) strengthening education, and raising the resources efficiency awareness of the entire nation; and 6) improving organization and coordination, and working on a solid implementation.

Ship Building Innovation Capacity Enhanced

During the 10th Five-year period (2001-2005), China's ship building industry has witnessed a rapid growth, with noticeably enhanced competitiveness and innovation capacity in the following aspects:

Before the 10th Five-year period, China was only able to manufacture oil tankers or bulk carriers up to 150,000 tons, and container ships up to a capacity of 2700 TEUs. During the 10th Five-year period, China has independently rolled out a Very Large Crude Carrier (VLCC) of 300,000 tons, bulk carriers up to 175,000 tons, and super container ships up to a capacity of 8530 TEUs. It has also completed the design and development of advanced container ships, including 9200TEU and 9600TEU, which creates a basis for manufacturing the container ship with a carrying capacity of 10,000 TEUs. The successful development of LNG tankers with a capacity of 147,000 cubic meters has made China one of the countries in the world enjoying cutting-edge ship building technologies.

During the 10th Five-year period, China also completed the localization of type III large power and low-speed diesel-powered engine, which raised the localization of VLCC from 4.6% in 2003 to 37% in 2004. In addition, Chinese researchers landed breakthroughs from scratch in independently making the crank for the low-speed diesel-powered engine. They also worked out the proprietary designs for the propellers of LNG tankers with a capacity of 16,500 m^3 and 22,000 m^3, crude carrier of 72,000 tons, bulk carrier

of 74,000 tons, and oil tanker of 105,000 tons.

Home Software and Hardware for Information Platforms

Not long ago, the Ministry of Information Industry had established an expert panel and a project management office for implementing a project that will make home made software and hardware the basic skeletons of public information platforms. The two newly created bodies are responsible for working out a technical roadmap for the project, and supervising the implementation and daily management. The expert panel has so far convened six working meetings, to define the terms of reference, and discuss working plan, implementation plan, technical roadmap, and phase results. The project has gone smoothly as planned.

Contractors to the project are currently working on their respective annual plans, organizing workforce, and formulating implementation plans and technical roadmaps. Under the guidance of the expert panel, contractors have been working closely in line with the requirements. Up to date, they have completed the investigation of eight demonstration sites in the Pinggu District of Beijing, Huangpu District in Guangzhou, Beilin District of Xi' an, S&T Bureau and Donghu District in Nanchang, S&T Bureau of Changzhou, Deyang City and Ya'an City of Sichuan, and Information Office of Xinjiang Uygur Autonomous Region. In addition, researchers have completed the configuration design for the e-government platform, and the associated mock environment, and a demonstration and application system. A project management platform （www.bps.org.cn）, developed to support the work of the expert panel, has been put into operation. An advanced training course has been offered to those who will be part of home made generic software based e-government.

Home Made Generic Software for Health Platform

Chinese Ministry of Health plans to introduce home made generic software in the health information platform. Under the principle of unified management, simultaneous implementation, different completion dates, and ensuring both progress and quality, the Ministry of Health has set up an array of teams to work on Electronic Health Record (EHR), electronic diseases monitoring system, and digital hospitals, with clearly defined terms of reference, plans, working schedule, and expected results.

Up to date, investigators have collected and analyzed some 200 technical and policy documents, from both domestic and overseas sources, concerning Electronic Health Record, digital hospitals, and electronic diseases monitoring system. In the meantime, they visited health institutions, hospitals, research institutes, and enterprises in Beijing, Shanghai, Jiangsu, Zhejiang, Guangdong, Jiangxi, Sichuan, and Shenzhen, collecting data needed for future study. A seminar was also sponsored to solicit the views and comments of the representatives from the Ministry of Health, health institutions in Zhejiang and Shanghai, the Union Hospital, and military hospitals.

Three project panels involving health information, home made generic software, and training have raised their respective technical requirements, based on enhanced communications. A seminar and accompanying show on electronic health record and digital hospital, under the co-sponsorship of three project panels, was convened in 2006, in an attempt to encourage exchanges of views among participants. The event spurs up the application of information technology in hospitals and associated management, creating a path for establishing proprietary digital hospitals with Chinese characteristics, and advancing the digital information process of China' s health system. It also creates a platform for exchanging views and needs between home software vendors and users, allowing hospitals to have a better understanding of home-made software, and creating a solid basis for further applications of home-made software.

RESEARCH AND DEVELOPMENT

Digital Supersonic Wind Tunnel

Under the guidance of ZHANG Hanxin, academician of the Chinese Academy of Sciences, a Chinese research team has proposed, for the first time in the world, three key theories on complex flow mechanisms, which makes a powerful theoretical support for computational aerodynamics. Based on an in-depth analysis of every phenomenon concerning separation flow and vortex motion, and innovative thinking, researchers have worked out, for the first time in the world, mathematic conditions for judging the 3-D regular flow separations, which produces a conclusive answer to an academic debate that has lasted for more than two decades. The unique topological theory for analyzing the complex flow fields, also developed by the team, has for the first time unveiled the relationship between horizontal and vertical flows. Have been cited repeatedly by other researchers, the findings constitute a major contribution to the development of aeronautics and space technologies in the world.

In the course of developing a supersonic software platform, researchers successfully rolled out China' s first well-functioned supersonic software platform that has found extensive applications in R&D of weaponry. The progress has greatly raised China' s overall level in the area. With the platform as a technical support, researchers have worked out key solutions for addressing key technical difficulties, and eventually rolled out China' s first digital supersonic wind-tunnel.

Zero Emission Desulfurization

Additives free desulphurization and denitrification for coal burning boilers, an innovative technology developed by the Beijing Institute of Environmental Science based on the principle of oxidation, has created a combined process for dust removing, desulphurization and denitrification. The new technology produces no waste water and residues, with a denitrification rate higher than 90%, and a dust removing rate above 99%, basically wiped out nitrogen monoxide. The technology has passed pilot experiment, technical review, and trial operation.

The innovative technology enjoys the merits of completing the full process of dust removing, desulphurization and denitrification in the purification tower, without calling for additives. It works on the chemical properties of dust and residues, catalyzing sulphur dioxide into sulfuric acid, utilizing the iron oxide in coal dust, before absorbing nitrogen monoxide by acid water, using Fe2. The sulphite derived from sulphur dioxide is then used to purify nitrogen monoxide wastes. In the final part of the tricks, sulfuric acid is added to turn the metal oxide in the dust into sulphate.

Sparing a dust remover, the technology becomes economically competitive for a cost at only a third of the current system. It also increases the internal temperature and heating efficiency of boilers, with a decreased consumption of feeds. It makes a good solution for addressing sharply increased nitrogen monoxide when boiler' s temperature goes up. Most suitable for the boiler burning high-sulfur coal, the technology provides a thorough solution for scale formation caused by desulphurization. It saves water by half, and causes no secondary pollution.

Digital PKM Platform

Digital R&D platform for Parallel Kinematic Machine (PKM), developed by Tsinghua University under a National 863 Program component for advanced manufacturing and automation, was recently put into operation. The event has filled up a blank, and is of importance to raising the efficiency of PKM design and manufacturing

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The platform is a practical tool with integration and visualization functions. With the help of the platform, users can easily work on PKM designs, including kinematics analysis, scale integration, kinematics simulation, mainframe design, dynamic analysis and optimization, precision analysis, calibration algorithms, parts simulation, and operation simulation. It facilitates the design of Parallel Kinematic Machine, and shortens the development cycle. Possessing 3 software copyrights and a prototype platform, the project expects to be a PKM leader in the country.

NEWS BRIEF

China Discovers CYLD Genes

Scientists of Anhui Medical University have discovered the CYLD genes of Trichoepithelioma, the first instance in the world. The effort creates a basis for curing the skin tumor.
In collaboration with the Southern Center of National Human Genome Program, scientists of Anhui Medical University kicked off the study in 2001. The 5-year efforts has led to the discovery of the CYLD genes, through positioning the CYLD genes of Chinese Han population. The finding unveils the genetic characteristics of Trichoepithelioma and associated gene and expression types, which constitutes a theoretical basis for further studying the pathogenesis aspect of the disease, and for genetic diagnosis and consultation, and associated drug development and treatment as well. According to a briefing, the finding, which has won the international acknowledgement and been cited for more than 30 times by academic journals, makes a momentum for the development in the area.

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