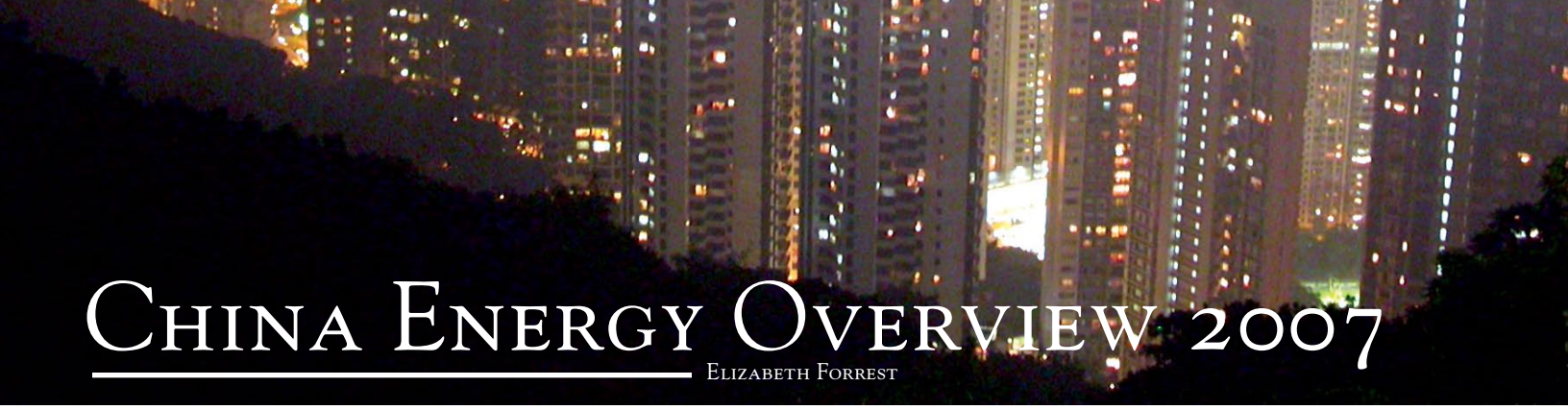
Market Trends Digest

November 2007

NEWTON-EVANS RESEARCH COMPANY



China Energy Overview 2007

Elizabeth Forrest

China is currently one of the global leaders in production of electricity, and its power demand growth is also amongst the highest in the world. In 2006, China's energy supply and demand both surged ahead at an amazing pace in the shadow of its 10% GDP growth. Total energy consumption increased by 14% while the amount of energy generated grew by 13.5% in 2006, to 283 million kW. Its main energy production comes from coal-fired power plants, a process the world is trying to change. According to World Bank's archives, China's energy sector mid-term goals include: Ensuring Energy Supply Reliability to Meet Demand Growth, Reducing Environmental Damage, and Increasing the Efficiency of Energy Use.

Energy Supply Reliability

By year-end 2000 China's total installed capacity reached around 320GW, and at that time it was estimated to grow by another 50 GW by 2005. This was to be followed by an additional 100 GW by 2010 and a total of between 850-950GW by 2020. However, electricity consumption has jumped much higher than expected, and the provinces on the eastern seaboard that are responsible for the country's export boom (i.e. Guangdong, Fujian, Zhejiang, Jiangsu, and Shanghai) have had a serious issue with power reliability and have experienced shortages. As early as 2004, nineteen of China's thirty-one provinces have had to ration electricity. The Chinese expect a power shortage of 10-15% in their key manufacturing industries and estimate that it will cost about $108 billion to generate enough capacity needed over the next five years in order to close the gap. As of current estimates, China's total primary energy consumption is expected to more than double between 2000 and 2020.

The Chinese government needs additional funding and loans from the World Bank to create power generation facilities. China will also need to address problems stemming from piecemeal approaches to restructuring the energy sector and the slow development of a regulatory framework. This lack of regulatory framework is leading to inefficiencies and abuses of monopoly/monopsony power, mismatches between loan maturities and economic life cycles of power projects, inadequate wholesale electricity, transmission pricing regiments and low efficiency of electricity supply and usage.

Managing the Environment

The need to begin managing its environmental resources while increasing energy capacity is actually a two-fold concern for China. First, the country must reduce its dependence on coal-fired energy production. Second, China must increase the proportion of gas and renewables into the energy mix.

In 2002, 67% of China's primary energy consumption was derived from coal. The country's reliance on coal isn't expected to decrease significantly over the next two decades. Current predictions estimate that coal will account for 66% of primary energy consumption in 2010, and coal based power generation will account for 65-70% of total generation for the next 20 years.

The people of China are pushing for a change due to their ever-present smog and bad air problems. China's carbon dioxide emissions (second only to the U.S.) are also a global threat. Acid rain already falls on around 30% of the country, and the damaging effects could spread.

Another concern with continuing dependence on coal is its lack of economic efficiency, modern management and technology. For instance, a majority of the country's 30,000 coal mines that provide 30% of the country's coal needs are unsafe and escalate environmental damage by not washing raw coal. Also, resources are wasted by using sub-optimal exploitation.

Renewable Energy Initiatives

In 2002, China's gas consumption was 2.7% of its primary energy. China already has a goal to meet 10% of its domestic fuel needs with coal-to-liquids by 2020. In 2005, the government of China formed the China Renewable Energy Scale-up Program (CRESP), which works in conjunction with the World Bank and Global Environment Facility (GEF) to provide assistance with the implementation of a renewable energy policy development and investment program. It aims to: 1) study the current renewable energy resources status; 2) learn from the experiences of developed countries in the development of renewable energy; 3) study and formulate renewable energy development policy in China; 4) implement renewable energy scale-up development; 5) provide cost-effective and commercial renewable energy electricity to the electric power market; and 6) replace coal-fired generation and reduce the local and global negative environmental impacts. CRESP is a 10 to 12 year program, implemented in three phases. (http://www.cresp.org.cn/english/about.asp)

In China's eleventh Five-Year Plan, the goal is to build a sustainable economy and develop clean energy substitutes for coal and oil. In the guidelines, the National Development and Reform Commission (NDRC) also recommends forming price and tax incentives to encourage energy conservation. With the equivalent of 200 billion U.S. dollars investment planned for energy efficient building features by 2020 and international cooperation at the top of its agenda, there are many opportunities for U.S. and European companies to take part in this clean energy initiative.

Also aiding China's push to move to renewables is a mandated market policy to be implemented through the enactment of a Renewable Energy Promotion Law (REPL), which was ratified by the People's Assembly in February of 2005. Four provinces (Fujian, Inner Mongolia, Jiangsu, and Zhejiang) have agreed to adopt the law voluntarily and take the actions necessary, with the support of CRESP, to be in compliance by 2008.

While renewables only counted for 10% of China's primary energy consumption in 2002 (with hydropower as the dominant source), the country should have few problems incorporating renewables into their mix in the future, as they are one of the most well-endowed countries in terms of natural resources in the world. China is estimated to have 160GW of wind power, over 75 GW of commercially exploitable small hydropower, about 125 GW of biomass energy, 6.7 GW of known geothermal energy and high levels of solar power available in many parts of the country.

Increasing Efficiency of Energy Use

China has poor efficiency in its heating sector. The country consumes approximately 180 million tons of raw coal/year for space heating in urban residential and commercial buildings in its cold and severely cold regions. The current energy use per unit is twice what buildings in similar climates use, with a far lower level of comfort.

The government has tried to put building codes in place to reduce the energy use per unit while confronting a substantial boom in building construction which is overwhelming efforts to enforce the code, and there is currently little incentive for builders to adopt the codes. (for more information go to www.worldbank.org)

Newton-Evans' 8th Worldwide Study of SCADA, Energy Management and Distribution Management Systems to Begin in November

Newton-Evans Research Company's eighth major, in-depth international research program studying electric power industry trends, supervisory control and data acquisition (SCADA) systems, energy management systems (EMS), and distribution management systems (DMS) will begin in November. The findings of the study will be presented in a four-volume report series that will measure current market sizes and offer projections, on a world region basis, through year-end 2010.

The World Market Study of SCADA, Energy Management Systems and Distribution Management Systems in Electric Utilities: 2008-2010 will provide an appraisal of central and remote site hardware and applications software requirements that electric utilities will be requesting during their next round of procurements. In addition to profiling utility requirements collectively and by company size, type and location, the research program will focus on defining the broader product and market requirements that suppliers must meet in order to successfully participate in the SCADA/EMS/DMS programs within the electric utility community worldwide. The world regions in this research program will include the North American, European, Latin American, Middle East, African and Asian markets. The series will provide a comprehensive and informative report on the control systems usage patterns and plans of electric utilities around the world.

The group of North American utilities represented in previous studies provided electricity services to approximately 50% of the served North American electricity market. Internationally, Newton-Evans Research Company was able to capture about 22% of the rest of the world's served electric consumer market.

Survey topics will include:

- Extent of use of SCADA, EMS and DMS systems by the world's electric power utilities
- New applications of interest to electric power operations management teams
- SCADA/EMS/DMS procurements. New, replacement and upgrade plans for SCADA/EMS/DMS
- Operating systems, Database management systems, GUIs viewed as acceptable to utility operations teams
- Approaches for reducing vulnerability on operational networks within the utility and participation with various ongoing cyber security initiatives
- External assistance and third party services requirements in control center operations

Early subscribers to this study may receive an opportunity to submit a limited number of questions to be included on our survey.

Latest Activities and Reports

Fault Detection,
Isolation and service Restoration

Newton-Evans Research Company recently completed a report based on a client-funded research program involving utilities from throughout North America and from more than 25 major international utilities. The study focused on distribution feeder automation as it relates to Fault Detection, Isolation and service Restoration.

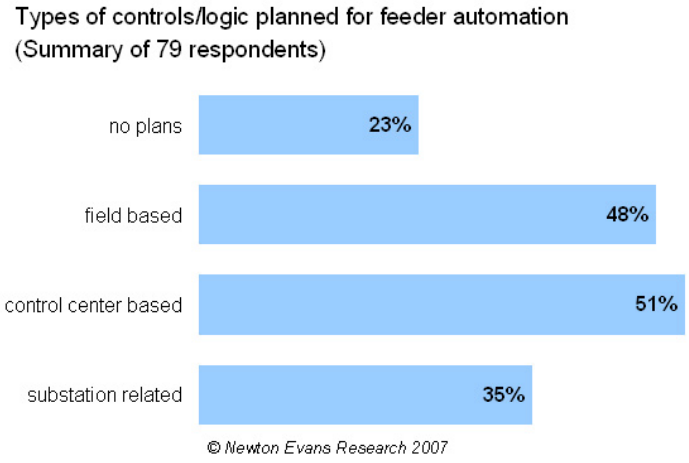
A total of 81 utilities completed the survey and follow-up interviews during the three months of field research conducted by Newton-Evans Research staff. There are more than 29 sub-sections to the report. The last pages of the report include listings of comments related to the FDIR survey.

The North American sample alone represents 35% of all North American customers and revenues for electric utilities. The sample represents about 30% of all electric utility-operated T&D substations in North America.

Type of Controls/Logic Planned For Feeder Automation:

Scores of utility distribution planning officials replied to this question. Multiple responses were permitted as many utilities plan to adopt more than one approach to the types of controls being applied to feeder automation. Fifty-one percent of utilities indicated the type of controls being planned (or in use) for feeder automation are to be control center-based, while forty-eight percent indicated "field based" controls. Thirty-five percent of those surveyed cited "substation-based" controls for feeders. Nearly one quarter of the respondents (23%) had no plans for feeder automation at the time of the study.

U.S. utilities participating in the study were more likely to use or plan to use field-based controls, while their international counterparts were more apt to use or plan to use control-center-based controls.



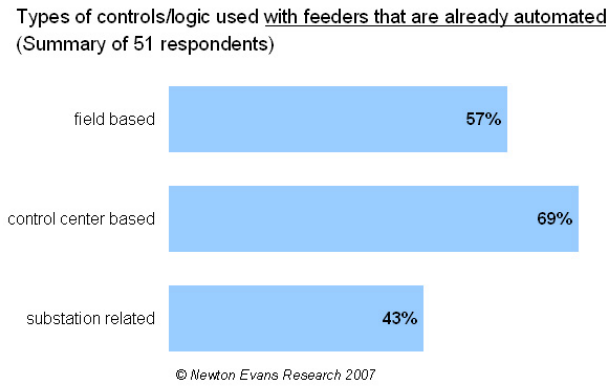
Type of Controls/Logic Used with Feeders Already Automated:

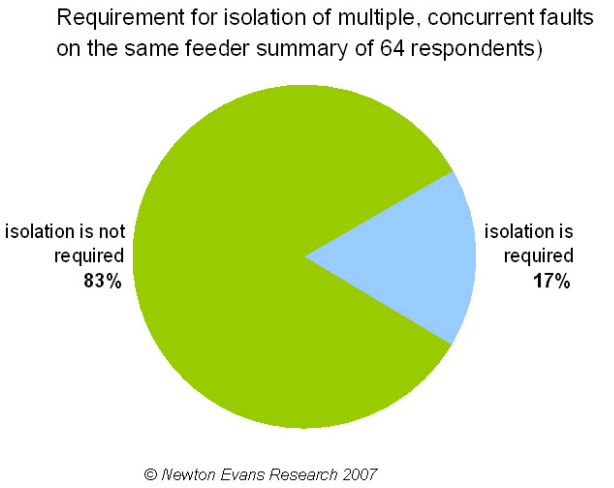
For utilities operating feeders that are already automated, a mix of the three approaches to automation was being used. Control-center based controls are in place at a little over two-thirds of the sites, 57% are using field based controls or logic and 43% indicated use of substation-based controls. U.S. utilities are more likely to be using or planning field-based controls – predominantly in the IOU community – while public and cooperative utilities are very likely to be using or planning to use control-center based tools. International utilities also favored control center-based approaches with those feeders already automated.

Latest Activities and Reports (cont'd)

Requirement for Isolation of Multiple, Concurrent Faults on the Same Feed

Of the total respondents to this question only seventeen percent indicated having a requirement for isolating multiple, concurrent faults on the same feeder. Eighty-three percent of the respondents did not see a requirement for this capability. Each subgroup reported similar ranges of responses regarding this requirement.





Protection Coordination Engineering Services

In the first week of October Newton-Evans Research Company completed a client-based study of protection coordination engineering services and protection relay testing services. The study centered on a survey of 50 utilities from the United States and a dozen other countries. Respondents were asked if certain protection engineering activities are done in-house, outsourced, a little of both, or not at all. As a follow up, respondents were asked for further detail on criteria used in making the decision to outsource protection engineering to a third party. This question was asked for transmission, distribution, and generation systems where applicable.

The exploratory survey of American utilities represents a five percent sample of the universe of American power utilities, based on number of customers served (seven million served by the surveyed utilities out of a total of 140 million metered sites). Many of the responding utility officials provided additional insights based on their experience, their plans and their rationale for using (or not using) outside protection and control engineering services.

Protection, Automation & Control World Magazine

An article summarizing the Newton-Evans Worldwide Study of the Protective Relay Marketplace in Electric Utilities: 2006-2008 will be appearing in an upcoming autumn edition of PACWorld (Protection, Automation and Control World Magazine). PACWorld is a fairly new resource for information and discussion related to protection, automation, control, and standards. Editor In Chief Dr. Alexander Apostolov describes the goal of the organization as follows:

PAC World is a content independent organization with a goal to provide a forum for discussions between protection, automation and control professionals from all over the world. Articles, reports on industry conferences and organization activities, news, opinions and anything else considered of interest to the community will be published in the PACWorld magazine and/or on this web site.

The technical articles focus on developments and application of new protection, automation and control technologies, experiences and analysis of protection operations and local or wide area disturbances.

Any material published in the magazine or on the web site is open for discussion by the community in order to expand knowledge on the presented subject or clarify issues that might be of interest to the readers. Highlights of the discussions will be made available by the editors together with responses of the authors.

One of PAC World's goals is to keep its readers informed on the reports and standards published by leading industry organizations such as IEC (Technical Committees 57 and 95, as well as others when appropriate), CIGRE (Study Committee B5) and IEEE PES (Power Systems Relaying Committee and Substations Committee). Summaries of completed working group reports or standards may be published as well.

For more information about PACWorld, to access whitepapers, or for a free subscription for a limited time, visit www.pacw.org

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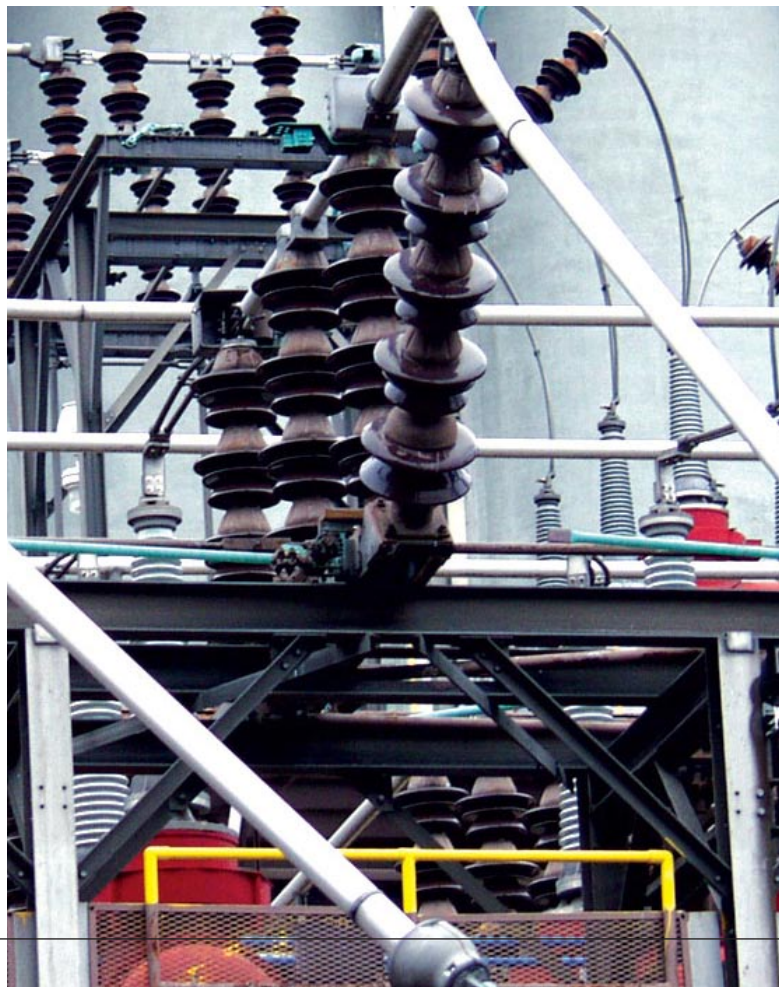
PROTECTION, AUTOMATION & CONTROL WORLD



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Ordering Information

To order our reports, fax, e-mail or mail this form with a check (U.S. dollars) or credit card information to **Newton-Evans Research Company, Inc., 10176 Baltimore National Pike, Suite 204, Ellicott City, Maryland 21042**. If you are in need of further information, please call our office toll free at **(800)-222-2856** or **1-410-465-7316** outside the U.S. or email **eleivo@newton-evans.com**. Our fax number is **1-410-750-7429.**

AVAILABLE IN APRIL 2008!!

The World Market Study of SCADA, Energy Management and Distribution Management Systems in Electric Utilities: 2008-2010 — ❒ **Complete set: $7,500**

❒ Volume 1: North American Market	$2,500	❒ Volume 2: International Market	$2,500
❒ Volume 3: Market Forecast/Assessment	$2,500	❒ Volume 4: Supplier Profiles	$750

The World Market Study of SCADA, Energy Management and Distribution Management Systems in Electric Utilities: 2005-2007 — ❒ **Complete set: $5,000**

❒ Volume 1: North American Market	$1,750	❒ Volume 2: International Market	$1,750
❒ Volume 3: Market Forecast/Assessment	$1,750	❒ Volume 4: Supplier Profiles	$500

The Worldwide Study of the Protective Relay Marketplace in Electric Utilities: 2006-2008 — ❒ **Complete set: $5,250**

❒ Volume 1: North American Market	$1,750	❒ Volume 2: International Market	$1,750
❒ Volume 3: Market Forecast/Assessment	$1,750	❒ Volume 4: Supplier Profiles	$500

The World Market for Substation Automation and Integration Programs in Electric Utilities: 2005-2007 — ❒ **Complete set: $7,500**

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❒ Volume 3: Equipment Supplier Profiles	$750	❒ Volume 4: Market Analysis/Forecast	$3,000

The World Market for SCADA Systems in Gas & Oil Pipeline Operations and Gas Distribution Utilities: 2006-2007 — ❒ **Complete set: $3,750**

❒ Volume 1: Global Summary of Findings	$1,650	❒ Volume 2: Market Analysis/Forecast	$1,650
❒ Volume 3: SCADA Supplier Profiles	$500		

Please provide our report(s) via: ❒ CD-rom ❒ Email ❒ Print Copy (add $95 printing fee)

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