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PRATT & WHITNEY'S NEW FRONTIER BY DICK FLANAGAN



Jim Maser, President of Pratt & Whitney Rocketdyne with Dick Flanagan

WEST PALM BEACH, FL - The technology that launched the US space shuttle has found a new home on the energy block.

"Our core strategy is wrapped around our core technology. Our liquid propulsion base generates the unique intellectual capital to extrapolate into these other markets. Energy is turning out to be a very

nice fit for this kind of technology," Jim Maser, President of Pratt & Whitney Rocketdyne told *World-Gen* during a one-on-one interview held in Florida on P & W's Media Day. "We're pursuing an energy portfolio that has levels of technology maturity across the portfolio." The most mature is solar energy.

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CHINA'S 12TH FIVE-YEAR PLAN BY DEBORAH SELIGSOHN



Deborah Seligsohn, World Resources Institute

BEIJING, CHINA - The draft of China's much-anticipated 12th Five-Year Plan was released on Saturday, March 5 at the opening session of the National People's Congress. While there may be some changes to the Plan before it is finalized, in past years these have not been large.

World Resources Institute obtained a copy of the 118-page draft of the 12th Five-Year Plan which we used as the basis for our analysis. In the meantime, *Xinhua* provided a summary of the major targets included in the 12th Five-Year Plan. In addition, a number of the key reports delivered at the first day of the NPC are also online in both Chinese and English, and these reports include the Work Report issued by Premier Wen Jiabao. Premier Wen's Work Report includes both an assessment of the previous five years and a summary of highlights of the next Five-Year Plan. Our analysis is derived from both the initial draft of the 12th Five-Year Plan and the Work Report.

What's notable in the Plan and the Work Report is the prominent position of both climate change and

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Our 23rd Year

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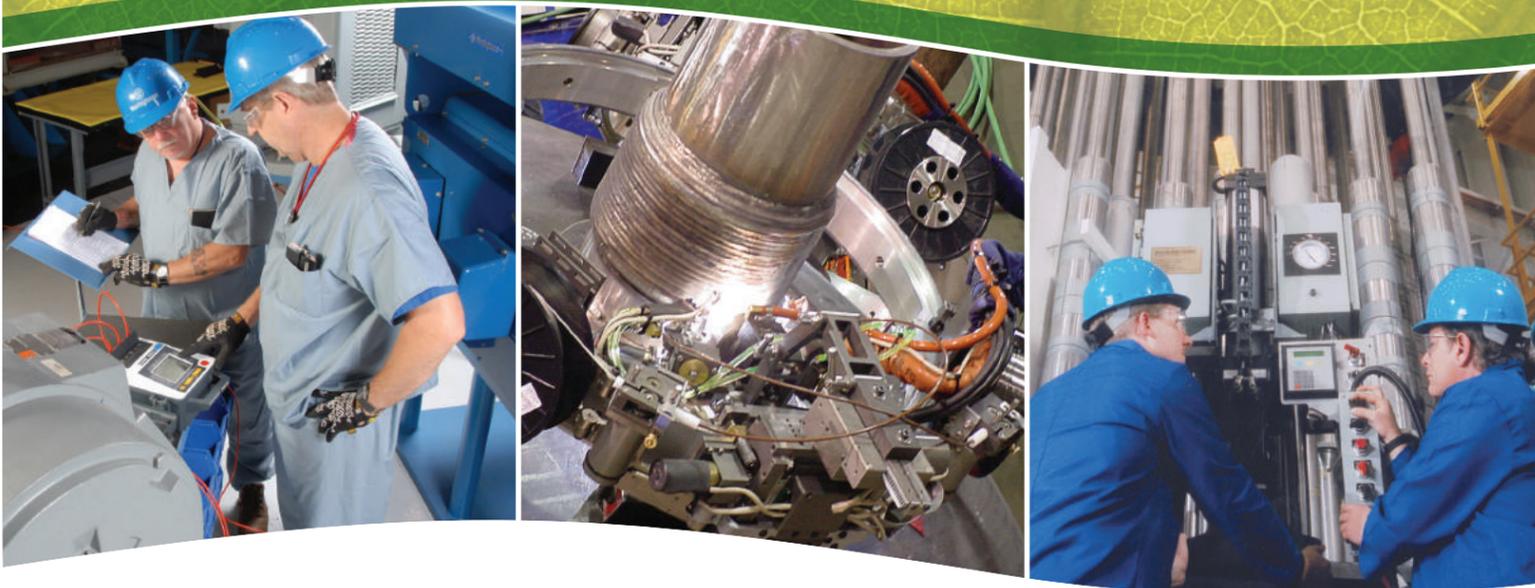
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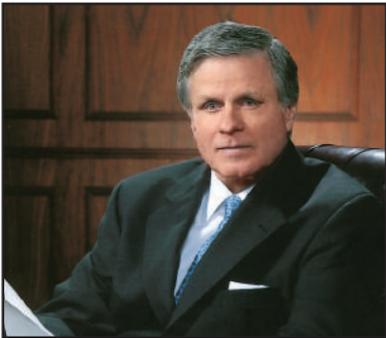


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PUBLISHER'S LETTER



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World-Gen was invited to attend Pratt & Whitney's Media Day held at its Rocketdyne facility in Florida, March 31. Two of Pratt & Whitney's divisions, Rocketdyne and Power Systems, are actively growing their energy portfolios, deploying technologies to increase efficiencies, in solar, geothermal, gasification, wind, hydrogen and gas turbines. Interviews can be read starting on page 1.

Deborah Seligsohn of WRI provides an analysis of China's 12th Five Year Plan derived from both the initial 118 page draft and the Work Report issued by Premier Wen Jiabao. What's notable, she says on page 1, is the prominent position of both climate change and environmental issues. She sees China exceeding earlier targets in non-fossil development. Nuclear could reach 40 GW by 2020.

California utilities must source 33% of their generation from renewables by 2020 and 75% of that must be generated in-state, Lyn Corum reports from California. She attended the Renewable Energy Summit in Winterhaven, CA and shares the pros and cons of developing and investing in transmission on page 13.

Dan Potash, Class of 2001, explores the links, dynamics, and conflicts operating between power sector planners and market adherents, and considers the new role of Integrated Resource Planning in today's new power markets. He experienced déjà vu working in Pakistan in 2011 versus California in 2001, noting the similarities as it relates to integrated resource planning on page 14.

Torys' in 2010 saw a resurgence in mergers and acquisitions activity, both in North America and internationally. The increase in M&A activity has also highlighted the growing tension between boards of target companies and their shareholders. Who should have the final say? Unlike courts and regulators in the United States, those in Canada are struggling with this question, Torys' M&A lawyers are looking to 2011 and what they see is on page 15.

Judah Rose and Sunita Surana, in a June 2010 article, formulated an investment strategy based on the premise that economic recessions are preceded by the inversion of yield curves and that the severity of the recessions is a function of oil price increases. During the past year there were constant concerns about a double-dip recession. This concern was contrary to their findings, and was in fact wrong. This update on page 16 reports that their approach withstood recent experience, and provides further analysis that shows that there is little threat of an imminent recession. However, if the yield curve inverts, current conditions will lead to a deep recession due to recent high oil price increases.

Wood Mackenzie sees mounting pressures from multi-pollutant policy proposals threatening the survival of the coal-fired fleet. Underutilized natural gas resources could push incremental natural gas demand up by 20 percent. Hind Farag concludes coal remains squarely in the crosshairs on page 17.

Jay Rhame's experience has shown that reaching for dividend growth can be a valid and successful investment strategy in the utility industry. He believes that selected utilities with the willingness and ability to regularly grow dividends should continue to provide competitive risk-adjusted returns over the long haul on page 18.

Perhaps the most important observation to be made over the last six months is the increase of investments in solar compared to wind. In 2009, investments in wind power considerably exceeded those made in solar. Wind and solar have now reversed position. The challenge now for renewable energy players will be to compete against other forms of energy investment. Jean-Michel Gauthier of Deloitte suggests three considerations in the new renewable landscape on page 19.

World-Gen was invited to the MIT Energy Conference at the Westin Copley in Boston, March 4th and 5th. Panels covered Emerging Markets, the Future of Small Modular Reactors, Renewable Fuels, and Electric Vehicles. The proceedings are linked on www.world-gen.com. Our website also has "Today's News", a new feature, the 16th Bueche Directory of Developers, Google Energy ads and advertisers' linked logos.

World-Gen is exhibiting at AWEA, Power-Gen Europe, EEI and will be attending APPA. Please stop by to say hello.

(continued page 12)



INDUSTRY NEWS

NEW VENTURE FORMED

STAMFORD, CT – GE, NRG Energy, and ConocoPhillips have committed \$300 million in capital to the new joint venture, Energy Technology Ventures, to fund approximately 30 venture and growth stage companies over the next four years.

The first investments are in companies developing technologies in solar photovoltaic, cleaner coal and non-food biofuels.

WESTINGHOUSE'S SMR

PITTSBURGH, PA – Westinghouse Electric Company introduced its Small Modular Reactor. The Westinghouse SMR, a 200 MWe-class, integral pressurized water reactor, extends the advances realized in the company's industry leading AP1000 reactor design. The Westinghouse SMR design uses passive safety systems and other proven technology to achieve the highest levels of safety.

SIEMENS TRIPLES

ORLANDO, FL - Siemens Energy was awarded a second order from Minnesota Power for 35 3-megawatt SWT-3.0-101 direct drive wind turbines for its Bison 2 wind energy center near Center, North Dakota. This order is the third contract award for Siemens direct drive wind turbines in the U.S., including Minnesota Power's and Oklahoma Gas & Electric's wind power plants.

VOGT TO SUPPLY

LOUISVILLE, KY - Vogt Power International will supply the Heat Recovery Steam Generators to Siemens Energy Inc. for Imperial Irrigation District's El Centro Power Plant in California. The new equipment is expected to increase fuel efficiency by 50 percent.

URS SELECTED

EL PASO, TX - URS has been selected by the El Paso Water Utilities as the solar power consultant for the world's largest inland brackish water desalination plant.

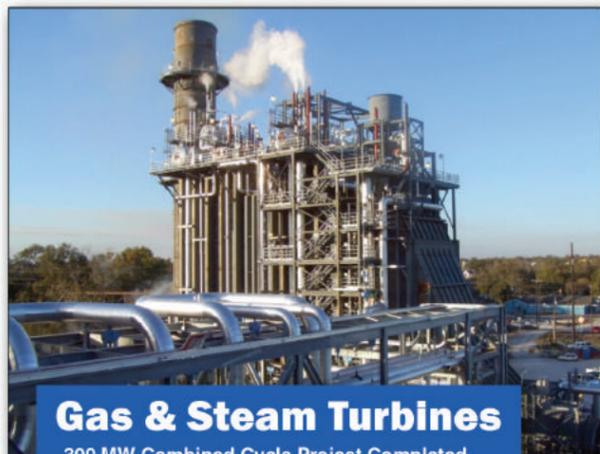
El Paso's Kay Bailey Hutchison Desalination Plant has the capacity to produce 27.5 million gallons of fresh water daily. The project is being carried out jointly by EPWU and Ft. Bliss, a U.S. Army Post in El Paso.

Power Engineering Design & EPC Construction

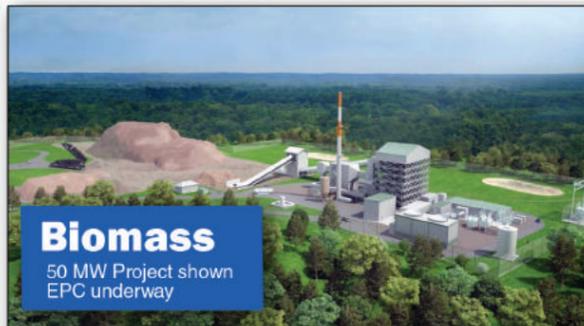
"Whatever the fuel or technology of your project you can depend on us to engineer innovative, dependable, cost effective design and construction solutions."



Bob Bibb, Chairman
bobbibb@bibb-eac.com



Gas & Steam Turbines
300 MW Combined Cycle Project Completed



Biomass
50 MW Project shown
EPC underway

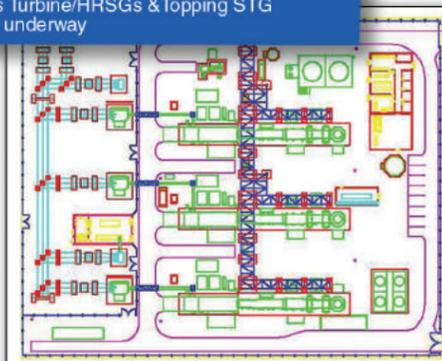


Solar (PV or CSP Thermal)
Design assistance for rooftop PV shown



Engine-Generators
Study for 50 MW "Wind-Firming" Project

Industrial Cogeneration
140 MW 3x Gas Turbine/HRSGs & Topping STG
Detailed design underway



SERVICES:

Detailed Design • EPC CM Studies
Owner & Bank Engineering

CLIENTELE:

Utilities IPPs Industry Universities
OEMs Banks/Investors

PROJECTS (New, Retrofit & Modifications):

Biomass Solar (Thermal & PV) Wind
Simple & Combined Cycle Fluidized Bed/PC/Stoker Boilers
Biofuels Landfill Gas MSW Gasification Pyrolysis
Plant Improvements Air Pollution Control Engine-Generators
CHP/Cogeneration Energy Savings Facilities/Buildings & Systems

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ENGINEERS
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CONSTRUCTORS

ABENGOA SIGNS PPA

DENVER, CO - Abengoa Solar has finalized \$1.45 billion financing to build Solana, the world's largest parabolic trough concentrating solar plant to generate 250 megawatts.

Abengoa Solar signed a power purchase agreement with Arizona Public Service Co. to buy the energy produced by Solana for a period of 30 years. The Solana project is the first large-scale solar plant in the United States capable of storing the energy it generates.

WHITE TO EPC

CLINTON, IN - White Construction Inc. has been selected by E.ON Climate & Renewables North America to provide engineering, procurement, and construction services for the Settlers Trail Wind Farm in Illinois. The work will be completed in October 2011.

White Construction Inc. has been involved in the construction of more than 4,000 MW of wind across the U.S. and Canada.

AMSC SIGNED

DEVENS, MA - American Superconductor Corporation has received a \$9 million follow-on order for the supply of wind turbine electrical control systems from Inox Wind Limited.

Inox has the ability to manufacture 400 of its 2 MW wind turbines annually at its facility in Una, India. India had 11,800 MW of wind power installed at the end of March 2010.

EMERSON INVESTS

PITTSBURGH, PA - Emerson has acquired Pittsburgh-based Turbine Control Service Associates.

Turbine Control Service Associates helps power plant operators improve generator performance and reliability by replacing aging controls with systems that take advantage of newer technology.

The company's Digital Generator Controller system currently controls generation of thousands of megawatts at nuclear, fossil and hydroelectric power plants.

SUNTECH INKED

SAN FRANCISCO, CA - Suntech Power Holdings and Zachry Holdings have been selected by Sempra Generation to design and construct the Mesquite Solar 1 project in Arizona. The electricity generated at Mesquite Solar 1 will be sold to Pacific Gas & Electric under a 150 MW, 20-year power purchase agreement. Construction will begin in mid 2011 with completion in by 2013.

OPT ON GRID

PENNINGTON, NJ - Ocean Power Technologies announced the completion of its PB150 PowerBuoy. The PB150 is designed for use in arrays for grid-connected power generation.

OPT's PowerBuoy device in Hawaii has been in operation for over a year and is now grid-connected, the first wave power device to be connected in the USA.

NAVIGANT IN DC

CHICAGO, IL - Navigant expanded the firm's Economics practice in the Washington, DC office. Joining Navigant Economics are George R. Schink, Cliff W. Hamal, Julie M. Carey, and Kathleen J. Rodenrys.

In addition, Joe D. Pace and Bruce M. McConihe have joined the group's affiliate network.

PATTERN SIGNED

SAN DIEGO, CA - San Diego Gas & Electric and Pattern Energy announced a 20-year contract for 315 megawatts of wind energy to be generated at Pattern's Ocotillo Wind Energy Facility.

Pattern plans to complete the project by the end of 2012 to coincide with a 2012 in-service date for the 500-kilovolt Sunrise Powerlink transmission line currently under construction.

SCHOTT SOLAR EXPANDS

ELMSFORD, NY - SCHOTT Solar announced that it will be extending its global photovoltaic production capacity to more than 800 MW in 2011. SCHOTT Solar's 500 MW module manufacturing facility in Albuquerque, N.M. will be extended by 300 MW.

"We will continue to provide our U.S. customers with high-quality, domestically produced solar panels and continue to support U.S. jobs at our Albuquerque facility," said Tom Hecht, President and Chief Sales Officer of SCHOTT Solar PV, Inc. Hecht's a member of *World-Gen's* Class of 2011.

EX-IM BANK APPROVES

WASHINGTON, D.C. - The Export-Import Bank of the United States has given final approval to a \$420 million medium-term loan guarantee facility and a \$459.8 million long-term loan guarantee facility to help finance the sale of goods and services from various U.S. exporters to Ecopetrol S.A., Colombia's national oil company.

Colombia is one of nine economies with a growing appetite for infrastructure development that Ex-Im Bank has identified as offering U.S. companies the greatest opportunities for increased export sales.




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INDUSTRY NEWS

ALSTOM ACQUIRES

WASHINGTON, DC - Alstom completed the acquisition of UK-based Psymetrix. The Psymetrix and Alstom Grid teams will jointly develop and launch critical new software applications for power electronics, advanced controls, substation automation, and grid self-healing.

PECO PICKS ALU

PHILADELPHIA, PA - Alcatel-Lucent has been selected to build an advanced IP-based optical communications network as part of PECO's initiative to upgrade metering technology for customers. PECO serves more than 1.6 million customers in southeastern Pennsylvania.

HONEYWELL TO PILOT

MINNEAPOLIS, MN - Honeywell was selected to develop and implement China's first smart grid pilot project and feasibility study. The project is part of a grant agreement between the U.S. Trade and Development Agency and State Grid Electric Power Research Institute.

URS AWARDED

SAN FRANCISCO, CA - URS Corporation has been awarded a contract by AREVA Enrichment Services LLC to provide procurement, construction and management services for the Eagle Rock Enrichment Facility.

EREF is a planned nuclear fuel enrichment facility that will be located in Idaho and will supply low-enriched uranium for use in commercial nuclear power plants in the U.S. This project has received a \$2 billion conditional commitment for a loan guarantee from the U.S. Department of Energy.

CATERPILLAR REPOWERS

PEORIA, IL - Caterpillar Inc. announced that the Georgia Ports Authority has signed an agreement to purchase 17 generator sets as part of an ongoing effort at the Port of Savannah.

The repower project will replace the non-regulated and Tier 1 diesel generator.

AMSC SIGNS

DEVENS, MA - American Superconductor Corporation has signed a definitive agreement to acquire The Switch Engineering Oy, a power technologies company headquartered in Finland.

The 190-million-Euro acquisition (US\$265 million) is expected to be immediately accretive and support AMSC's growth to US\$1 billion in annual revenues. For calendar year 2010, The Switch generated approximately US\$179 million in total revenue and approximately US\$15 million in net income.

SIEMENS INKED

ORLANDO, FL - Siemens Energy's Instrumentation, Controls & Electrical Business Unit has signed two new contracts for its innovative plant-wide distributed control systems.

Siemens will upgrade the existing control systems of five Oglethorpe Power Corporation power plants with the Siemens Power Plant Automation T3000 (SPPA-T3000) system.

Voith Hydro, sub-contractor for American Municipal Power, has contracted Siemens to install and test its SPPA-E3000 electrical system at four new power houses of AMP's Ohio River project.



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INDUSTRY NEWS

IBM, PROGRESS TEAM

ARMONK, NY - IBM has been selected by Progress Energy to be the lead systems integrator for the utility's smart grid program. Progress Energy is investing approximately \$520 million in smart grid technologies through its two utilities that serve approximately 3.1 million customers in the Carolinas and Florida. The total investment includes \$200 million from a smart grid grant awarded by the DOE as part of ARRA.

SIEMENS COMMISSIONS

ORLANDO, FL - Siemens Energy commissioned its pad-mount transformers at the Flat Water Wind Farm. The 60-megawatt Flat Water Wind Farm has 40 1.5-MW wind turbines. Siemens was sub-contracted by Renewable Energy Systems Americas Inc.

GE ACQUIRES

ATLANTA, GA - GE has entered into an agreement to acquire 90 percent of Converteam, a provider of electrification and automation equipment and systems. Converteam is based in Massy, France and has 5,300 employees based in 80 countries, with 2010 sales of \$1.5 billion.

TEI TO SUPPLY

SANTA FE SPRINGS, CA - Thermal Engineering International has been awarded a contract to supply modular replacement condenser bundles and supplementary equipment for a Pennsylvania Utility. TEi will design, fabricate and deliver four half condenser modules.

HONEYWELL SELECTED

DES PLAINES, IL - Envergent Technologies, a Honeywell company, has been selected by Premium Renewable Energy (Malaysia) Sdn. Bhd. to perform the engineering design for a project that will use Envergent's RTP® Rapid Thermal Processing technology to convert palm biomass to renewable heat and electricity.

The initial Premium RTP facility, will be completed in early 2013 and will be Malaysia's first plant to use RTP for the production of a clean-burning liquid biofuel derived from biomass. The RTP liquid fuels will be used to generate renewable electricity and heat.

WESTINGHOUSE PROVIDES

PITTSBURGH, PA - Westinghouse Electric Company has entered into a long-term agreement with South Carolina Electric & Gas Company to provide nuclear fuel fabrication services for the V.C. Summer nuclear power plant in South Carolina.

The contract is valued in excess of \$400 million and includes fuel fabrication services for the existing reactor there, as well as for two new AP1000 nuclear power units currently in the early stages of construction. First delivery is scheduled to occur in 2012, and the contract runs through 2033.

PV AWARDED

PHILADELPHIA, PA - The first Photovoltaic Projects of Distinction Awards were presented to three projects in the Northeast/Mid-Atlantic region by the Solar Energy Industries Association and the Solar Electric Power Association at the PV America show. The awards were presented to Silver Lake Solar Facility, Pittsfield, MA; Carlisle Area School District Ground Mount Solar Array, Carlisle, PA and Family Residences and Essential Enterprises Project, Long Island, NY.



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INDUSTRY NEWS

SEC, ENERNOC SIGN

BOSTON, MA – EnerNOC entered into a contract with Southern California Edison to deliver EnerNOC's EfficiencySMART™ data-driven energy efficiency application.

"Using data to achieve persistent energy savings is a cost-effective solution," said Tim Healy, CEO of EnerNOC. Healy is a member of *World-Gen's* Class of 2008.

GE EXPANDS

PLAINVILLE, CT - GE completed the acquisition of privately-held Lineage Power Holdings, Inc., from The Gores Group. Lineage Power is a global provider of high-efficiency power conversion infrastructure technology and services to optimize energy efficiency with end-to-end solutions. Lineage had revenues of \$450 million in 2010.

ALSTOM ACQUIRES

SANTA CLARA, CA - Alstom has acquired Utility Integration Solutions, Inc. UISOL develops and commercializes DRBizNet™, a software platform for demand response management, and is among the leading utility systems integration specialists. The company employs 44 employees and generated over \$11 million (€7.7 million) in total 2010 sales.

AWEA REPORTS

NEW YORK, NY - America's wind power industry grew by 15% in 2010 and provided 26% of all new electric generating capacity in the United States. With the 5,116 MW added last year, U.S. wind installations now stand at 40,181 MW. It is second in new generation capacity only to natural gas.

"The American wind industry is delivering, despite competing with energy sectors that have permanent government subsidies in place," said Denise Bode, CEO of the American Wind Energy Association. Bode is a member of *World-Gen's* Class of 2009.

Manufacturers continued to respond to the demand and set up shop in the U.S. bringing 14 new manufacturing facilities online, consistent with 2009. Wind energy accounts for up to 20,000 manufacturing jobs across 42 states. The U.S. wind market entered 2011 with 5,600 MW under construction.

MISTRAS INKS

PRINCETON JUNCTION, NJ - Mistras Group acquired Skala Incorporated, North America's premier supplier of rope access services, training, and equipment. Mistras Ropeworks completes the Mistras Group's total wind power services offering that includes factory blade inspection; on line structural blade monitoring; tower structural integrity inspection; transformer & substation inspection & monitoring; and drive train preventative and predictive maintenance services.

B&W GRANTED

CHARLOTTE, NC - Babcock & Wilcox has received a \$5 million grant from the Virginia Tobacco Indemnification and Community Revitalization Commission (TICRC). The grant supports further development of the B&W mPower™ reactor. Babcock & Wilcox Nuclear Energy and Bechtel Power have formed a joint company, Generation mPower LLC, to design, license and build the next generation of nuclear power plants based on B&W mPower reactor technology.

UTEP TO SOLAR

The University of Texas at El Paso was awarded a \$1 million grant to create UTEP's first renewable energy resource system on campus. The system, which the University will obtain through a competitive acquisition process, will generate approximately 300,000 kilowatt hours per year.



June 12-15, 2011 • The Broadmoor • Colorado Springs, CO

EEI Annual Convention/Expo

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Guest Program Speaker: Former First Lady Laura W. Bush

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- ▶ Hear headline-making speakers at the General Sessions. **The 43rd President of the United States George W. Bush will address the Closing General Session on Wednesday morning, June 15.**
- ▶ Stay on the cutting edge with the latest technologies, products and services at the Expo.
- ▶ And, this year's Guest Program is not to be missed – **Former First Lady Laura W. Bush** will speak to registered guests on Tuesday afternoon, June 14.

Find out how companies are tackling some of the industry's most important strategic topics – renewables, energy efficiency, electric vehicles, new technologies and more – at the Critical Issue Forums.
Last year more than 50 CEOs and senior executives spoke at the forums.

For hotel and conference registration, discount flights and programming updates, visit... www.eei.org/2011

GE STUDY

WASHINGTON, DC – GE released a study, Flare Gas Reduction: Recent Global Trends and Policy Considerations, which estimates that 5 percent of the world's natural gas production is wasted by burning or "flaring" unused gas each year—an amount equivalent to 30 percent of consumption in the European Union and 23 percent in the United States. Gas flaring emits 400 million metric tons of CO₂ annually, the same as 77 million automobiles, without producing useful heat or electricity. Worldwide, billions of cubic meters (bcm) of natural gas are wasted annually, typically as a by-product of oil extraction.

The report provides a region-by-region analysis of gas flaring trends.

SOLAR TRACKED

AUSTIN, TX - Mercom Capital Group released funding and merger and acquisition (M&A) activity for the solar sector during the first quarter of 2011.

Venture capital funding in the solar sector was off to a great start for Q1 2011, coming in at \$658 million in 25 deals, compared to \$238 million in the previous quarter and \$311 million in the first quarter of last year. The trend was similar with M&A activity amounting to \$1.4 billion in 18 transactions for Q1 2011, compared to \$266 million in Q4 2010 and \$909 million in Q1 2010. Debt and other types of funding activities came in at \$9.7 billion for the quarter with 15 deals.

The top five funding deals made up for almost 70 percent of the total funding in this quarter, led by a \$201 million Series E raised by BrightSource Energy, a concentrated solar power company. MiaSole, a copper indium gallium selenide (CIGS) thin-film panel maker raised \$106 million in Series F funding; Alta Devices, a gallium arsenide (GaAs) thin-film developer raised \$72 million in a Series C; Solopower, a CIGS based flexible thin-film maker, raised \$51.6 million in Series E; and Kiran Energy, a solar power project developer raised \$30 million in a Series A.

Among countries, the U.S. was dominant in VC funding, accounting for 87 percent of all VC funding in the first quarter; 89 percent of all VC funds raised by solar companies in 2010 were also from the U.S. "When it comes to VCs investing in solar, the US continues to dominate," commented Raj Prabhu, Managing Partner of Mercom.

Out of \$9.8 billion announced in debt and other funding, \$7.6 billion came in from the Bank of China for Jinko Solar. This is a continuing trend from last year, where Chinese government banks provided a total of approximately \$34 billion in credit to Chinese solar manufacturers. There was \$2.1 billion in non-Chinese debt transactions showing significant improvement in the credit markets in Q1 2011. There was only \$2.2 billion in non-Chinese Debt and other funding in all of 2010.

ADVATECH TO EPC

SAN FRANCISCO, CA - URS Corporation announced that Advatech LLC, a joint venture between URS and Mitsubishi Heavy Industries America, has been awarded a contract by Ameren Energy Generating Company to provide engineering, procurement, construction and commissioning services.

CENG AWARDS

ONTARIO, NY - Mitsubishi Power Systems Americas has been awarded a multi-million dollar contract by Constellation Energy Nuclear Group, LLC (CENG) to replace the 750MVA generator at the R.E. Ginna Nuclear Power Plant.

The replacement is part of a \$50 million enhancement program.

EV STATIONS

DALLAS, TX – NRG Energy is funding eVgo Freedom Station in Texas. NRG plans to install a total of 70 Freedom Stations in Dallas/Fort Worth and 50 in Houston by the end of 2012. NRG also plans to electrify the Interstate 45 corridor connecting them in 2012.

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INTERNATIONAL NEWS

AUSTRALIA

AREVA Solar has been awarded a contract to install a 44 megawatt solar thermal augmentation project at a 750 megawatt coal-fired power station in Queensland. AREVA Solar's Australian-pioneered Compact Linear Fresnel Reflector (CLFR) technology will be installed at CS Energy's Kogan Creek Power Station.

CHINA

Westinghouse Electric Company awarded Emerson Process Management contracts totaling approximately \$17 million to supply its Ovation™ expert control technology at the Sanmen Nuclear Power Plant in Zhejiang Province and at the Haiyang Nuclear Power Plant in Shandong Province. Each plant has two 1,000-megawatt reactors currently under construction.

CHINA

AMSC has received an initial order for wind turbine electrical control systems from Dongfang Turbine Co., Ltd. For use in the 3MW and 5 MW full conversion wind turbines designed by and jointly developed with AMSC. DTC plans to begin volume shipments of these systems in 2012. DTC is also exploring options to upgrade the 5 MW to 5.5 MW.

ESTONIA

Alstom signed a €950 million contract with Narva Elektriijaamad AS, a subsidiary of Estonia's state owned utility Eesti Energia, to supply two 300 MW units for a fossil fuel power plant based on Circulating Fluidized Bed (CFB) boiler technology. The power plant will be fueled with local oil shale.

FINLAND

Babcock & Wilcox Vølund A/S has been awarded a \$35 million contract with Finland-based EkoKem OY to supply equipment for a 36 megawatt waste-to-energy, combined heat and power plant in Riihimäki.

GERMANY

AREVA has won a contract worth 400 million euros with Trianel, an association comprising German urban electric utilities, to supply 40 five megawatt (MW) M5000 turbines for the Borkum West II offshore wind farm located in the North Sea.

INDIA

Emerson has acquired full ownership of its Fisher Sanmar Limited joint venture from Sanmar Engineering Corporation, expanding the capabilities of Emerson Process Management in India. The purchase price was \$135 million for the business and additional land.

KUWAIT

Alstom has been awarded a contact worth approximately €170 million by Al Ghanim International to build a steam-tail add-on power plant for Kuwait's Az-zour gas powered power plant, located approximately 80 km south of Kuwait City.

LATVIA

Vogt Power International has received a contract from Gama Power Systems Engineering and

Contracting Inc. to supply a Heat Recovery Steam Generator (HRSG) and associated equipment to the Riga TPP2-Phase II combined cycle power plant project. The HRSG will be installed at the AS Latvenergo Generating plant located in Riga.

MALAYSIA

Alstom has signed a power plant contract worth the equivalent of over €650 million with Tenaga Janamanjung Sdn Bhd to provide key power generation equipment to South East Asia's first 1000 MW supercritical coal-fired power plant Manjung, Malaysia



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INVITATION TO PARTICIPATE

Europe's largest electricity industry event, POWER-GEN Europe returns to Milan in June 2011, alongside its co-located events Renewable Energy World Europe, and Nuclear Power Europe. This represents three crucial facets of the power industry under one roof.

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ADDRESSING THE HOT BUTTON ISSUES

To find out more about POWER-GEN Europe, Renewable Energy World Europe, and Nuclear Power Europe, please visit the event websites:

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POWER-GEN Europe
www.powergeneurope.com

Renewable Energy World Europe,
www.renewableenergyworld-europe.com

Nuclear Power Europe
www.nuclearpower-europe.com

MEXICO

PIC Group has entered into a full service maintenance management agreement with InterGen for the 271 megawatt Chihuahua Combined Cycle Power Station located near Juarez.

NEW ZEALAND

Parsons Brinckerhoff and its consortium partners, SNC-Lavalin and McConnell Dowell, have been awarded the engineering, procurement and construction contract for the development of Contact Energy's 166 MW Te Mihi geothermal project.

POLAND

Alstom has signed a contract with PGE Gornictwo i Energetyka Konwencjonalna S.A., which operates Belchatow, Europe's largest coal-fired power plant, to retrofit six generators at the power plant's units 7 to 12.

The total output increase of the project will be more than 120 MW.

PORTUGAL

Natural Power, RES and the Faculty of Engineering at the University of Porto have signed a research and development joint venture focused on developing the next generation VENTOS[®] computational fluid dynamics model for wind energy applications.

QATAR

Struthers Wells has been awarded a contract to supply a thermal reactor furnace, waste heat boiler and steam drum to Technip-Chiyoda Joint Venture, for Qatar Liquefied Gas Company Ltd's Plateau Maintenance Project in Ras Laffan.

ROMANIA

GE is teaming with wind farm developer Monsson Alma for two projects that will add 35 megawatts of wind capacity to the country's power grid and 10 years of maintenance for the Silistea 1 project.

RUSSIA

Alstom signed a contract with RESAD to supply one GT13E2 gas turbine to the Molzhaninovka power plant in Russia, the first entry of Alstom's GT13E2 turbine into the Russian gas market.

RUSSIA

Russian power generation company TGK-9 has selected advanced gas turbine technology from GE for a combined-cycle plant that will supply heat and electricity for the residents of Berezniki, an industrial city in Russia's Urals Federal District.

SAUDI ARABIA

Alstom Grid has been awarded two contracts worth a total of €57 million by the Saudi Electricity Company for five substation extensions located in Dirab, Huraymila, Al-Hayit, Baqaa and Al-Rosan. Two new 132 kV/13.8 kV substations are both located in Riyadh.

SOUTH KOREA

Emerson Process Management has received a contract from Babcock-Hitachi K.K. to install its PlantWeb[™] digital plant architecture with the Ovation[™] expert control system at units 9 and 10 of the Dangjin Thermal Power Plant in South Korea. These are the country's first 1,000-MW ultra-supercritical units.

SWEDEN

GE has signed a contract to supply a 4.1-113 wind turbine, along with associated services, to Göteborg Energi for installation in the Gothenburg, Sweden harbor in the second half of 2011.

THAILAND

Vogt Power International announced receipt of an award from Toshiba Plant Systems & Services Corporation to supply the Heat Recovery Steam Generators for the Amata Nakorn: ABP3 Combined Cycle Cogeneration Plant Project located in the Mueang district, Chonburi Province.

TURKEY

Wärtsilä has received an order for seven Wärtsilä 18V50SG natural gas fuelled engines with a combined output of 135 MW. The order has been placed by Odas Elektrik Uretim, an independent power producer (IPP) for its new plant at Urfa.

The plant is scheduled for completion in the fall 2011, and will supply power to the national grid.

TURKEY

Emerson Process Management has been awarded a contract for technology and services to automate two units of the Ambarli power plant, west of Istanbul.

The units are being updated by engineering contractor EPP to help the state-owned EÜAŞ generating company meet the increasing demands for electricity in Turkey.

VIETNAM

Alstom has signed the renewal of a long term Service agreement with Phu My Thermal Power Co. and covers the gas turbines, steam turbines and the generators installed in the Phu My 2.1 and Phu My 4 gas-fired power plants, over a term of eight years.

POWER

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NEWSMAKERS

GALLO NEW CEO

AREVA Renewables announced that Bill Gallo will become Chief Executive Officer of AREVA Solar, headquartered in Mountain View, CA.



Bill Gallo

STARK JOINS

Ballard Spahr announced that Roger D. Stark joined their Washington, D.C., office, from Curtis, Mallet-Prevost, Colt & Mosle LLP.



Roger D. Stark

MCGRATH NAMED

The American Solar Energy Society announced that Shaun McGrath will take over as the organization's executive director on April 1.



Shaun McGrath

FOLEY PROMOTED

ACCIONA Energy promoted Daniel Foley to the position of CEO of ACCIONA Energy North America, from his current position of chief development officer for the company.

AP&M NAMES

Aviation, Power & Marine named Melody Manning as the new Director of IGT Sales.

MPOWER NAMES



Christofer Mowry



Ali Azad

Christofer Mowry, previously Chief Executive Officer for Generation mPower, has been appointed Chairman. Ali Azad has been named President and Chief Executive Officer, and Ted Feigenbaum, Bechtel's project director for Generation mPower, has been appointed as the Chief Operating Officer. Feigenbaum is a member of World-Gen's Class of 2006.



Ted Feigenbaum

HUNT APPOINTED

Sheldon Hunt has been appointed Vice-President of Operations for Ocean Thermal Energy Corporation based in Hawaii.



Sheldon Hunt

ANGA APPOINTS

America's Natural Gas Alliance has named Tom Hassenboehler as Vice President of Policy Development and Legislative Affairs.

BRDAR TO COO

Petra Solar appointed Dan Brdar as Chief Operating Officer, with responsibility for strategic and operational leadership.



Dan Brdar

CEO AT SCHOTT

SCHOTT North America announced the appointment of Linda S. Mayer to the office of President and CEO, effective April 1, 2011.



Linda S. Mayer

NORDEX SELECTS

Nordex USA announced the appointment of Dany St-Pierre as Vice President Sales.



Dany St-Pierre

NAES WELCOMES

NAES Corporation announced that Butch Kimbrell has joined NAES as Vice President of Construction, and Bob DeNeve as Vice President of Business Development.

WÄRTSILÄ APPOINTS

Wärtsilä's Board of Directors has appointed Mr Björn Rosengren as its new President and CEO.



Björn Rosengren

PATTON BOGGS ADDS



Cynthia A. Marlette



Scott Binnings

Patton Boggs expanded its energy regulatory and enforcement practice with the addition of Counsel Cynthia A. Marlette, former general counsel of FERC, and Associate G. Scott Binnings.

HEMING ELECTED

At EPIA's Annual General Meeting, members elected Dr. Martin Heming as new Director to the Board of the association, the world's largest photovoltaic electricity market association. Heming is CEO of SCHOTT Solar AG.



Dr. Martin Heming

IRENA ELECTS AMIN

Adnan Amin was elected Director General of the International Renewable Energy Agency (IRENA) by a vote of 76-36 in Abu Dhabi.



Adnan Amin

TENDRIL APPOINTS

Tendril has added Brent Hodges to its management team as General Manager, Australia.



Brent Hodges

PUBLISHER'S LETTER

CONTINUED FROM PAGE 3

WORLD-GEN MEDIA KIT

September/October 2011-GRID WEEK, SOLAR POWER, ANS. Closing September 1st.

November/December 2011-POWER-GEN INTERNATIONAL, 17th BUECHE DIRECTORY OF DEVELOPERS. Closing November 1st.

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RELIABILITY, TRANSMISSION VEX INDUSTRY

BY LYN CORUM, CLASS OF 2003



As this column is being written, federal and state agencies are focusing attention on assuring the general public all operating nuclear plants in the US are safe and will not suffer the fate of the Fukushima Daiichi nuclear power plant in Japan. In California, public attention is being focused on speeding up seismic examinations of the impacts newly discovered faults that lie about a mile from the San Onofre and Diablo Canyon Nuclear Generating Stations will or will not have.

However, less colorful issues are roiling the horizon that perhaps will have larger impact on California's power industry long term: reduced reliability in Southern California because new generation cannot get built, and disagreements over the need for new transmission in the southeastern corner of the state that could bring renewable resources to load centers. Also, controversial rules to enforce AB 32, California's Global Warming Solutions Act, will start to impact the industry in the next two years.

Cap-and-trade of greenhouse gas emissions is not in trouble yet in spite of a recent ruling by a California Superior Court judge in San Francisco and it is not raising much of a fuss. Developed by the California Air Resources Board as part of AB 32, the cap-and-trade rule is designed to reduce GHG emissions from power plants. It is scheduled to go into effect next January. The judge said that CARB should have analyzed the potential impacts of various alternatives to the cap-and-trade regulation.

The lawsuit was brought by several environmental groups, including Communities for a Better Environment, which favor a carbon tax. However, better known environmental groups such as the Natural Resources Defense Council back the cap-and-trade rule.

A CARB spokesman stated publicly that the agency completed a comprehensive analysis of the alternatives in a 500-page environmental analysis that fully addresses the concerns the court raises. CARB Chairwoman, Mary Nichols said the ruling will have little impact because the plan is "not of any legal force." She noted,

"The cap-and-trade rule has already been adopted and in fact is already in effect."

SOUTHERN CALIFORNIA RELIABILITY

Representatives from the California Energy Commission, CARB, California Independent System Operator, the California Public Utilities Commission and the State Water Resources Control Board, working as a task force, released a draft work plan in early February. It stressed the need for an assessment of the electrical reliability needs in the Los Angeles area over the next 10 years.

A 2009 state law had mandated the report, and the task force is to "recommend the most effective and efficient means of meeting those reliability needs while at the same time complying with state and federal law."

The state law was written in response to a Los Angeles Superior Court decision in 2008 that invalidated rules that the South Coast Air Quality Management District used to award emissions reduction credits to power plant projects seeking construction licenses. The decision had the effect of stopping virtually all new generation construction in the SCAQMD service area. The lawsuit had been filed by several environmental groups claiming, in part, the new power projects requesting ERCs were not needed and would not improve air quality.

At a public workshop in mid-February, the task force sought comments from stakeholders on the work plan which brought into stark reality the conflict between coastal power plant retirements in the Los Angeles area and the inability of replacement power projects to acquire ERCs so the projects could be constructed.

Coastal power plants totaling more than 7,600 MW will have to be retired or repowered in the next five years to comply with a state mandate by the State Water Resources Control Board to replace the plants' once-through cooling systems. The CEC staff believes most of these plants will retire or repower rather than refit cooling technologies. But just 1,900 MW are in the development pipeline which could replace lost capacity. Replacement solutions are to begin at the Los Angeles plants in 2012 and all are to be in compliance by October 1, 2015.

CEC Commissioner Karen Douglas said at the workshop, "The judge's questions are the same we all are asking – why are the plants here in the South Coast? Once the need is identified, what do we need to do about it?" Later she said, "My hope is we will develop a system needs analysis informed by a variety of technologies."

Three power plant projects with a nameplate capacity of 1,910 MW have been licensed by the CEC and could be built in

or near the Los Angeles basin thereby allowing some of the existing coastal plants that are required to eliminate once-through cooling to retire. Two have found ERCs and are or will be under construction, but one has not.

At the time of the court ruling in 2008, there were nine power plant projects in development in the region totaling 5,800 MW. Six have been canceled or are dormant.

John White, executive director of the Center for Energy Efficiency and Renewable Technologies, told the workshop panel, "We will have to head toward phasing out combustion eventually. One of the challenges we face is we need capacity to keep the lights on and feed the economy. We want all the capacity, but not run it all the time – only when we need it." Incentives are needed to minimize the number of hours fossil-fueled plants are operated," he said.

NEW TRANSMISSION NEEDED?

A county further south in Southern California – Imperial County where development of renewable resources, in particular solar, is taking off – has a different problem but one just as serious. It could be the energy breadbasket for California, if additional transmission were built. But that statement is questioned by some.

Cal-ISO says the area doesn't need more transmission beyond that which is planned. But utility and industry stakeholders speaking at the Renewable Energy Summit held in mid-March in Winterhaven, California disagreed. The issue becomes important because utilities, both investor-owned and publicly-owned, must source 33% of their generation from renewable resources by 2020. This rule is no longer a governor's executive order. The legislature passed it at the end of March and Governor Jerry Brown is expected to sign it into law.

David Nahai, former general manager of the Los Angeles Department of Water and Power and now a consultant and partner with Lewis, Brisbois, Bisgaard & Smith in Los Angeles, told attendees at the summit once the utilities are legally required to reach their 33% goal by 2020, Imperial Valley's lack of transmission outside the county becomes a state-wide problem.

Nahai said if this legislation as written is signed into law by the Governor, it would require that 75% of the renewable power must be generated in-state. "Unless we explore the resources in Imperial Valley, we cannot get to the 75% of the 33% requirement," he said.

In an interview later, Nahai said Governor Brown needs to take leadership over the transmission issue. There needs to be a discussion about state investment, in the form of bonds, or state help furnish-

ing the financing to build transmission lines.

Kevin Kelly, interim general manager of the Imperial Irrigation District, said "We will need a concerted effort to move power out of the valley to the load centers on the coast. The larger concern is that we come together as a region to [guarantee] that Imperial Valley has enough resources to power the entire state." Kelly said the county is largely Hispanic with a 25% unemployment rate and cannot make its ratepayers pay for the transmission improvements needed. Public-private partnerships are a good alternative, he said.

IID is already developing partnerships. It recently completed an open season for long-term wheeling contracts on its northern line known as Path 42 which it plans to start upgrading this year. Winning generators will pay for all transmission studies and system upgrades, and will be reimbursed through transmission credits.

NEW DEVELOPMENTS

One of the projects in Southern California that was stalled because it lacked emission reduction credits found a solution. Edison Mission Energy sold a 51% share in its 500-MW gas-fired peaking project to AES in December. The Walnut Creek project is to be located in the City of Industry about 10 miles south of downtown Los Angeles.

AES said it intends to retire two of four steam boiler units at its Huntington Beach power plant by 2013 and install two gas-fired turbines. This replacement would provide the Walnut Creek project an offset exemption from SCAQMD for 450 MW.

Edison Mission Energy already has some banked credits and will have to make some additional and expensive purchases on the open market to make up the 50-MW. Furthermore, Walnut Creek capacity will make up for the forced retirement of AES's units that currently use ocean water for cooling.

The Walnut Creek project has a power purchase contract with Southern California Edison to start delivering power in 2013. Construction needs to start this year. The Walnut Creek project was certified by the CEC in 2008.

A new gas-fired project has been proposed for the San Diego area. Apex Power Group submitted an application at the CEC in early February requesting a license for the 300-MW simple-cycle Pio Pico Energy Center to be located in Otay Mesa near the border. Apex and its partner, Energy Investors Funds, have already signed a 20-year power purchase tolling agreement with San Diego Gas & Electric and must have the plant operating by the end of May, 2014. SDG&E will have dispatch capability, the better to marry with renewable resources once they are built.

PERSPECTIVE

WHERE'S MY INTEGRATED RESOURCE PLAN?

BY DANIEL POTASH,
CLASS OF 2001



Integrated Resource Planning used to be a cornerstone of the electric power industry. In the brave new world of power markets, smart grids and nodal pricing, Integrated Resource Planning has a different role. Policy makers around the world are wrestling with how to plan in a market context. They say: "We used to have a bundled industry with predictability, and wonderful integrated resource planning. Now we've unbundled and deregulated and we lost our integrated resource plan that was so good." I heard this at meetings with power sector policy-makers in Sacramento, California and all the way to Islamabad, Pakistan, and I was struck by the almost word-for-word coherence in the complaint.

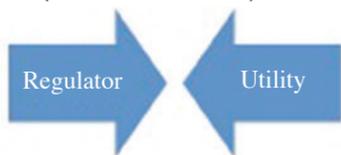
This article will explore the links, dynamics, and conflicts operating between power sector planners and market adherents, and consider the new role of Integrated Resource Planning in today's new power markets.

THE TRADITIONAL ROLE OF INTEGRATED RESOURCE PLANNING

Before the deregulation that started in the 1980's in the U.S., an integrated power utility would generally create an integrated resource plan for submittal to a public utility commission. The utility could collect information relatively easily from its departments: generation, transmission, and distribution. Demand for power was, and still is, highly correlated with economic growth. Wholesale natural gas prices were regulated. I recall being in engineering school in this time period and studying electric power demand forecasting. The professor of industrial economics showed us a graph of U.S. economic activity, a nice smooth straight line, and he said: "this is the great thing about America, everything always just goes up."

In this context of stability and order, the essential relationship of integrated resource planning was bilateral, between the regulator and the utility. The regulator established what level of reserve margin was appropriate, and communicated bilaterally

with the utility. The only other party in the engagement was the customer, but their interests were represented by the regulator. It was a simple system, as shown in the diagram "Old Style."



It may have been true that at times regulators were letting utilities have excess profits, or that reserve margins were too high. These matters were relatively easily analyzed and rectified by using comparative benchmarking. Having, in the U.S., more than 100 Investor-Owned Utilities gave numerous data points for comparing reserve margin, operating efficiency, management costs, and other metrics on which to judge performance.

Also, each utility issued debt and equity securities in a highly liquid capital market and so there was a rich database to measure the rate of return on equity relative to risk. One astute observer of utility regulation, Kenneth Meyer, theorized that if a utility had a price earnings ratio greater than one, it meant that the regulator was allowing too high a return on equity and was unduly rewarding utilities. But even so, the deviations were usually manageable in terms of customer impact.

In planning for future power generation, when an integrated resource planner was looking, in 1970's, at something like coal versus oil, there were hundreds of coal plants on which to base a cost comparison. Commodity prices were relatively stable. Still in spite of this more or less workable system, or perhaps because regulation can't be proven to be optimally tuned, economists argued that under regulation there were excess profits to be squeezed out of utility operations.

The promise of competition, as part of deregulation and unbundling was supposed to replace under-optimal central planning with the wisdom of market forces, thus driving down prices for customers. Now instead of the simple bilateral relationship depicted in the "before" diagram, there is a 5-way dynamic, that would seem to be much less stable.

Several difficulties appear to be emerging in the new paradigm:

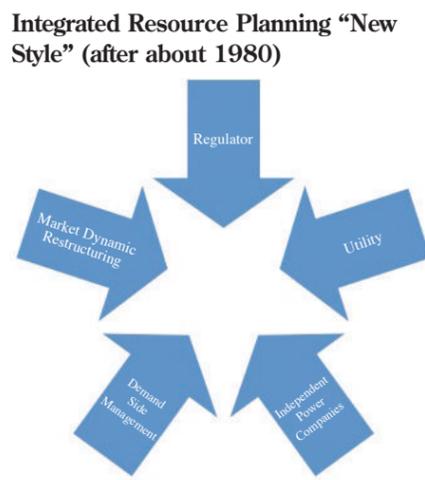
THE NEW ENVIRONMENT FOR POWER PLANNING

- Planning is more difficult when multiple parties are involved.
- Planning is more difficult when parties can opt in or opt out, like IPP 's (where the "I" stands for "independent")
- It is very difficult to get the incentives right, avoiding overbuilding or under-

building and avoiding excessive dependence on one source of power.

As noted in the beginning of the article I experienced déjà vu working in Pakistan in 2011 versus California in 2001, and noting the similarities as it relates to integrated resource planning, as follows

- There was too much faith put into the ability and willingness of private financiers to invest in unregulated generation, hence there was underbuilding of generation.
- Regulators, irrationally, held retail prices artificially low and let wholesale prices float.
- No restrictions were made to balance technology and fuel in the supply portfolio and so 95% of new generation was fossil-fueled thermal.



- Regional disputes existed in which companies and citizens that held primary energy resources felt they weren't adequately compensated for use or depletion (hydro and gas).

- Financiers abandoned the entire value chain – fuel, generation, distribution. Debt piled up, suppliers were stiffed, credit for all value chain activities dried up.

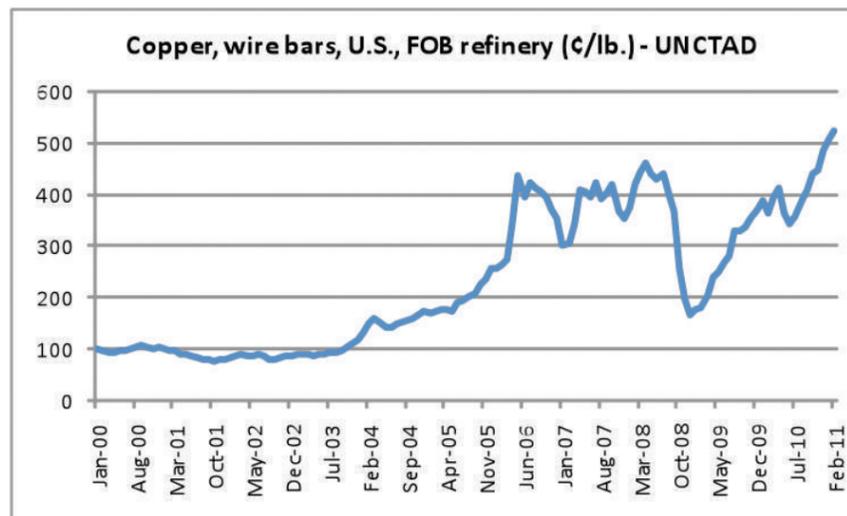
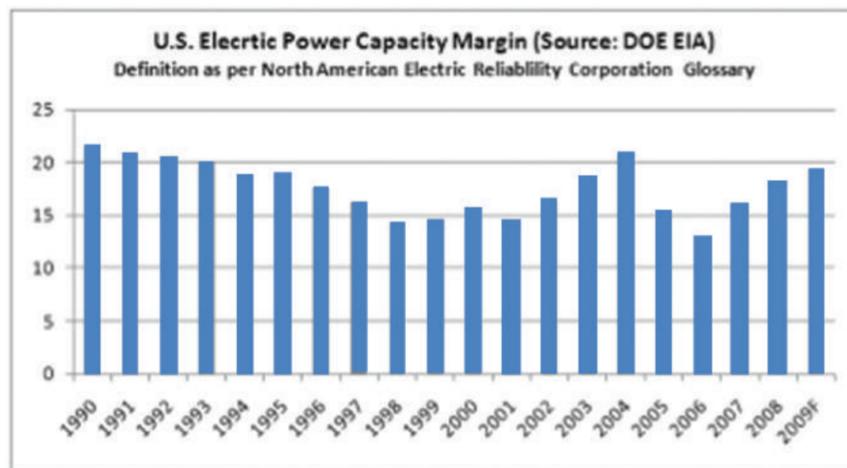
What seemed to be lost in both cases was not only the integrated resource planning functionality but more importantly the responsibility to build new power generation.

PLANNING IN THE NEW ENVIRONMENT

One of the reasons the new planning environment is less stable is that independent power companies are forced to take on excessive risk to produce shareholder returns, and so they may over build and cause a debt breakdown, which sucks liquidity out of the system. While this happens the planner cannot well forecast the cost of generation and make a least cost generation plan, because financing is unavailable. Political instability is rendered in the "New Style" diagram as Market Dynamics Restructuring, which affects planners as they try to grapple with fundamentals like the right mix of bi-lateral contracts and spot markets.

In the beginning of this article I said that policy makers around the world are

(continued page 19)



TORYS' TOP M&A TRENDS FOR 2011

The year 2010 saw a resurgence in mergers and acquisitions activity, both in North America and internationally. But accompanying this increase in activity were rising concerns – some old, some new – about the way M&A deals are done: What are the appropriate limits (if any) on foreign investment? Who should ultimately decide whether to sell a company or allow it to be transformed? And if shareholders decide, how do you know that their votes are cast and captured correctly?

The increase in M&A activity has also highlighted the growing tension between boards of target companies and their shareholders. Who should have the final say in respect of transformative corporate transactions? Unlike courts and regulators in the United States, those in Canada are struggling with this question, and their past inconsistent decisions have led to unpredictable results. We expect that in 2011 the debate over this issue will intensify.

Given the expanding role of shareholders in decision making, we expect that the process by which shareholders exercise their votes will come under greater scrutiny in 2011. Regulators on both sides of the border are being urged to review the mechanics of the proxy system and the growing influence of proxy advisory firms. In 2011, we will see regulators and M&A advisers focus on the authenticity and accuracy of shareholder voting.

Torys' M&A lawyers are looking ahead to 2011 and this is what they see.

1. WHEN FOREIGN INVESTORS TARGET CANADA, POLITICS MAY MATTER

By Omar Wakil and David Chaikof

The Canadian M&A story of the year was undoubtedly BHP Billiton's hostile bid for Potash Corporation of Saskatchewan and the federal Minister of Industry's rejection of the deal under the Investment Canada Act (ICA). Although the deal's rejection may reflect unique circumstances, its outcome is likely to affect the way foreign investors handle high-profile acquisitions in Canada.

After rejecting the transaction, the industry minister stated that BHP had failed to satisfy the statutory "net benefit" test. However, to most observers, politics was clearly the deciding factor. Popular and political opposition to the transaction had mounted, and the hostile nature of BHP's bid, and what some regarded as a low-ball offer price, also meant that the transaction had few commercial supporters: Potash management was opposed to the deal and the company's shareholders were indifferent. Had any one of these factors favoured BHP, the outcome could have been different.

M&A LESSONS

There can be little doubt that the federal government's rejection of the bid for

Potash will have implications for high-profile inbound M&A transactions. Under an overarching theme of "politics matters," several noteworthy M&A lessons are evident from the bid, some old and some new.

- Foreign investors should prepare for more rigorous net benefit commitments.

- The core group of M&A advisers has expanded. The traditional advisers on M&A transactions were often seen to be lawyers, investment bankers and HR consultants. It is clear that sophisticated acquirors now also include specialists in government, media and investor relations within their core group of advisers.

- The nature and identity of the foreign buyer may be a factor. The federal government has made it clear that SWF and SOE investors are welcome in Canada. Nevertheless, such investors should be aware of and be prepared to deal with potential political concerns.

- A hostile transaction means increased political risk. A negotiated transaction, particularly by SWF or SOE investors, will improve the likelihood of regulatory success.

- Seek enhanced deal protections when there is heightened regulatory risk. The federal government is aware of the potential impact of its decision in Potash and has been eager to reassure the business community that Canada remains open to foreign investment. For that reason alone, future non-approvals are unlikely, particularly in the near term. Although we expect most transactions to proceed in the normal course, Potash reminds us that in Canada, just as elsewhere, politics can be an important aspect of the foreign investment review process and that on high-profile deals prudent investors should come to Canada well prepared.

2. ALTERNATIVE TRANSACTION STRUCTURES WILL CONTINUE TO BE POPULAR FOR SOVEREIGN WEALTH FUNDS AND OTHER INVESTORS FROM EMERGING MARKETS

By Michael Amm and Darren Baccus

Sovereign wealth funds (SWFs) and other investors from emerging markets have become increasingly significant participants in the Canadian and U.S. M&A landscape in recent years. Notable examples in the United States include CIC's US\$1.58 billion investment in AES and its earlier significant investments in Morgan Stanley and Blackstone.

We expect this trend to continue in Canada and the United States, in particular with respect to transaction structures such as PIPEs (private investments in public equity) and other minority investments that are alternatives to the acquisition of 100% of a target company. In the resources sector,

these types of investments often include innovative arrangements such as ownership participation in the underlying resource assets and offtake agreements (whereby investors obtain the right and/or obligation to purchase over a number of years a set quantity of the production from a specific project, typically at market or otherwise agreed prices).

PIPE TRANSACTIONS AND MINORITY INVESTMENTS

PIPE transactions offer significant flexibility and can take a variety of forms, including common shares, preferred shares, convertible debt and warrants.

PIPE transactions and minority investments provide a number of key benefits for foreign investors, including these:

- There is increased speed, certainty and relative ease of execution compared with a 100% acquisition of a target company. Transactions can generally be negotiated and completed in as little as one month compared with a typical three- to four-month (or longer) timeline for a 100% acquisition.

- Investments involving the acquisition of less than a 20% voting equity interest can generally be completed without obtaining any shareholder approvals under applicable Canadian and U.S. stock exchange rules. In Canada, these investments can generally be completed without the need to obtain Canadian government regulatory approvals, including the "net benefit" foreign investment review under the Investment Canada Act. In the United States, these investments are generally less likely to raise political sensitivities and are typically subject to less intensive U.S. national security regulatory review.

- There is the opportunity to partner and share risk with the investee company and its stakeholders. This type of "on the ground" partnership and local presence can be a critical factor in making the investment a success for a foreign investor.

INNOVATIVE ARRANGEMENTS IN THE RESOURCES SECTOR

In the resources sector, a number of PIPE transactions have included innovative features such as offtake arrangements and the acquisition of a joint venture stake in the investee company's underlying resource assets. These features allow the investor to acquire both a strategic stake in the public company and direct access to resources; the investment stake in the public company may effectively serve as the "price of admission" to share in the underlying assets.

Investors may also acquire a minority joint venture interest in the underlying resource project and offtake rights without acquiring an ownership interest in the parent company.

3. "LET THE SHAREHOLDERS DECIDE"

By James C. Tory

Canadian corporate and securities regulatory laws are in a state of uncertainty about a fundamental corporate governance question – namely, the relative roles of directors and shareholders in making decisions on transformative transactions for a corporation. Should directors play the primary role as part of their responsibility to manage the business and affairs of the corporation? Or should shareholders, as the owners of the corporation, have the ultimate say? This question arises most dramatically in the context of hostile takeover bids when the target board undertakes defensive tactics that could preclude shareholder access to the offer.

Although directors are responsible for the management of the business and affairs of the corporation, in fulfilling this responsibility, they are obliged to act with a view to "the best interests of the corporation." Canadian corporate law traditionally equated the corporation's interests with the interests of "shareholders as a whole." Thus the duties of directors were aligned with and reinforced the shareholder primacy embedded in the governance framework established by corporate law.

Securities regulatory law in Canada has been aligned with the traditional shareholder primacy under corporate law: securities regulators have always placed shareholders' interests first, having regard to the regulators' investor protection mandate. The bedrock principles for Canadian securities regulators have been the protection of shareholder choice and the maximization of shareholder value.

BCE AND THE STAKEHOLDER VIEW OF THE CORPORATION

The traditional shareholder-centric model in Canada under both corporate and securities regulatory laws appeared to have been upset by the 2009 decision of the Supreme Court of Canada in BCE. That decision rejected shareholder primacy in favour of a view of the corporation as an amalgam of different constituencies, or stakeholder groups, each of whose interests must be considered by directors in determining the best interests of the corporation. According to the Supreme Court, it is now a mistake for the directors to equate the interests of the corporation with the interests of shareholders alone.

THE MAGNA CASE

This takes us to the Magna transaction, which came before Ontario courts and securities regulators this year. The transaction was to be done by way of a plan of

(continued page 20)

PERSPECTIVE

USING YIELD CURVES AND ENERGY PRICES TO FORECAST RECESSIONS - AN UPDATE

BY JUDAH ROSE AND SUNITA SURANA



Judah Rose

In a previous article, published in June 2010, we formulated an investment strategy based on the premise that economic recessions are preceded by the inversion of yield curves, and that the severity of the recessions is a function of oil price increases. This view is an integration of three sets of economic literature: (1) the predictive power of yield curves vis-à-vis the business cycle, (2) the oil shock theory of recessions, and (3) forensic analysis of past recessions over the last 40 years which highlight the role of the Federal Reserve which sets short-term interest rates and the degree to which external economic shocks constrain Federal Reserve policy choices.

During the past year there were constant concerns about a double-dip recession. This concern was contrary to our findings, and was in fact wrong. Thus, this update reports that our approach withstood recent experience, and provides further analysis that shows that there is little threat of an imminent recession. However, if the yield curve inverts, current conditions will lead to a deep recession due to recent high oil price increases.

YIELD SPREAD AND PROBABILITY OF RECESSION

While inversion of the yield curve is an excellent leading indicator of oncoming recessions, the yield spread also has predictive power, i.e., can provide probabilistic assessments or the likelihood of an oncoming recession. **Figure 1** shows that all through 2010 and even today (January 2011) there has been near zero chance of a recession occurring 12-18 months out. In other words, warnings of a double-dip recession were overblown. This assessment is based on a probit regression model that forecasts the probability of a recession 12-18 months in the future based on the current spread between the ten-year bond rate and three-month T-bill rate.

Yield spreads have historically been



Sunita Surana, Ph.D.

observed to fall (and then turn negative) prior to recessions. We use this historical data to predict the likelihood of subsequent recessions. The advantage of using the yield spread (vis-à-vis yield inversion) is that it provides a continuous forecast of the probability of a recession, i.e., the assessment can be made at any given point in time.

For forward looking recession assessments, different time periods in the future can be considered. Our choice of the length of time interval between the yield spread and the onset of the recession (12 and 18 months) is guided by the observed historical duration between the inversion of the yield curve and the onset of recessions. Note that inversion has been a perfect predictor of the last six recessions. **Figure 2** shows that the probability of a recession following the yield curve inversion is the largest between 15 and 20 months.

RIISING OIL PRICES

The recent run up in oil prices to \$90/barrel have again stoked fears of a double-dip recession among some analysts. We, however, believe that while oil prices influence the depths of recessions, they need to be viewed in conjunction with the slope of

the yield curve, and hence, Federal Reserve response to oil prices. Of course, massive increases in oil prices can have depressive income effects, both domestically and internationally, create uncertainty, and importantly constrain the monetary policy. To be sure, such developments can have an impact on the economic recovery. It also heightens the watch for an impending change in the slope of the yield curve.

An inversion in the yield curve and oil prices of \$90-100/barrel would suggest a coming recession of significant magnitude. Specifically, since the Second World War, such a recession would be milder in magnitude only to the past recession and the recession of the early 1980s. This is because the oil price increase from the recent low of approximately \$45/barrel during the first quarter of 2009 to \$90/barrel in 2011 would be approximately \$45/barrel. This increase, if sustained, would be the third largest in real terms since the early 1970s (see **Table 1**).

INVESTING IMPLICATIONS

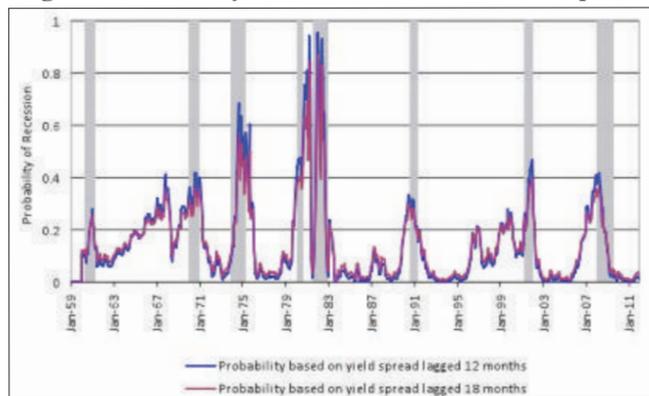
In our previous article published in

June 2010, we suggested an investment strategy to sell/forego investments once a recession is signaled, i.e., when a yield curve inversion occurs. With the yield curve positively sloped, our update is hold onto investments. With oil prices up, our update is to “keep a clear eye” for any inversion. Another potential implication is to hedge against inversions and/or high oil prices. Recently, hedge products are being offered related to the slope of the yield curve.

POLICY IMPLICATIONS

Given unemployment and other economic problems, another recession would be especially unfortunate. One way to minimize this risk is to pursue policies to lessen pressure on oil markets. This may be less ambitious than it appears at first blush because prices are set in part by market forces such as marginal supply and demand; average supply and demand have a smaller effect. The efficacy and overall desirability of specific policies is beyond the scope of this article.

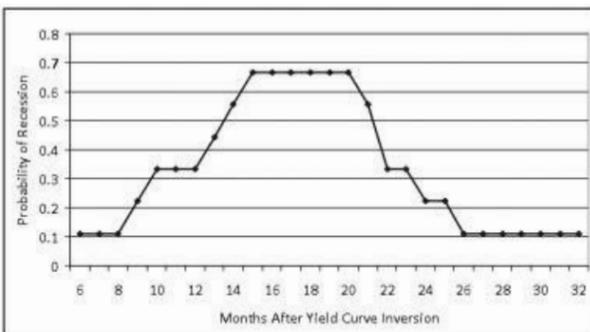
Figure 1 Probability of Recession Based on Yield Spread



Sources and Notes: Ten-year bond rate and three-month bill rate data from Federal Reserve Bank of New York and recession data from NBER. The vertical shaded areas represent recession periods.

Figure 2

Probability of Recession after Yield Curve Inversion



Sources and Notes: Ten-year bond rate and three-month bill rate data from Federal Reserve Bank of New York and recession data from NBER. This assessment is based on a series of probit regressions that forecast the probability of recession 6-32 months after the inversion of the yield curve.

Table 1

Magnitude of Oil Price Increases and Severity of Recessions

Recession		Crude Oil Price Increase (December 2010\$)	Length of Recession (Months)
Peak	Trough		
Nov-73	Mar-75	29	16
Jan-80	Jul-80	52	22
Jul-81	Nov-82	8	8
Jul-90	Mar-91	27	8
Mar-01	Nov-01	50	18
Dec-07	Jun-09		

Sources and Notes: Monthly oil price (WTI) data from the Federal Reserve Bank of St. Louis, inflation data from the Bureau of Labor Statistics, and recession data from NBER. For this calculation the two recessions from January 1980 through July 1980 and from July 1981 through November 1982 have been combined since these recessions occurred within a short period of time and were preceded by a large increase in crude oil price from mid-1979 through mid-1980. The oil price increases have been calculated based on tracking 12-month rolling average of WTI (method described in our previous article published in June 2010).

MOUNTING PRESSURES THREATEN SURVIVAL

BY HIND FARAG



The long-term economic viability of much of the coal-fired generation facilities across the U.S. is at risk, according to Wood Mackenzie's latest analysis of potential premature coal plant retirements. The power industry is facing unprecedented challenges, as regulatory and policy forces in conjunction with lagging economic activity align, resulting in significant uncertainty over the future of much of the existing coal fleet.

Representing about a third of the country's installed generating capacity and supplying half of our energy requirements, the coal-fired power plant fleet is facing mounting pressures that potentially threaten the existence of much of the installed capacity. Depending on their magnitude and timing, these coal plant retirement decisions could have considerable implications on the long-term power generation supply mix in North America.

KEY DRIVERS

Wood Mackenzie's analysis notes that key drivers for the anticipated power plant retirements include: the aging coal-fired fleet; increasingly stringent multi-pollutant, hazardous air pollutant (HAP) and coal ash handling rules currently under consideration by the Environmental Protection Agency (EPA). Also, perhaps less imminent, but certainly not the least impactful, is the now ever-present potential for climate change legislation. In addition other factors including rising capital costs, delayed power demand recovery in the aftermath of the recent recession, coupled with low to moderate natural gas prices are changing the economics for many aging, less efficient coal generators versus alternative sources such as renewables or natural gas generation.

The future of the nation's coal-fired generation fleet has recently garnered attention as several large utilities continue to disclose plans to retire or place on opera-

tion stand-by some of their existing coal-fired units. These announcements highlight the end of a tumultuous decade for coal-fired generation and are a harbinger of even tougher times ahead. Thus far, asset owners in the U.S. have disclosed plans to retire over 18 GW of their existing coal-fired generators by 2020. To put this into context, over the last decade, less than 30 gigawatts (GW) of power plants have been retired in North America, mostly representing old gas and oil-fired steam generators. Over the next 10 years coal plant retirements alone could easily exceed 60 GW in the U.S.

EPA PROPOSALS

Compliance with the proposed EPA rules for further regulating non-carbon emissions would require installing expensive emissions controls on generators not yet retrofitted; otherwise, these plants may incur extremely high SO₂ and NO_x emission allowance costs. This compounds existing challenges to the industry. Of the several EPA proposed non-carbon regulations, those with the most significant anticipated impact on the coal-fired fleet are: the Clean Air Transport Rule; Mercury and other Hazardous Air Pollutants (HAPs) Maximum Achievable Control Technology (MACT) standards; and a new rule under the Clean Water Act (CWA) addressing cooling water systems.

- Proposed in July 2010, the Clean Air Transport Rule (CATR) alone could have dire consequences for the existing coal-fired fleet in a relatively short time-frame, with the potential to ultimately force many generators into retirement as a result of the stricter regulation of SO₂ and NO_x emissions. The Transport Rule primarily aims to address the issue of interstate transport of pollution from upwind states due to its contribution to downwind states' non-attainment or interference with maintenance of National Ambient Air Quality Standards (NAAQS) for fine particulates (PM_{2.5}) and ozone.

- The EPA MACT standard for HAPs, proposed on March 16, would mandate a 91-percent reduction in mercury and acid gas emissions – which may require capital cost equipment upgrades in the range of \$100 per kilowatt to multiples of that amount. Thus, upgrading a 500 megawatt generator, under such a standard could cost \$50 million or more, beyond investments in SO₂ and NO_x emission reduction retrofits to comply with CATR.

- The March 28 EPA proposal under the CWA requiring plant owners and operators to use Best Technology Available (BTA) for cooling water intake structures,

the adoption of which could add further economic pressure on older, less efficient plants.

These non-carbon pollutant emission control costs not only diminish profitability prospects, but more importantly, put much of the coal-fired fleet at risk of becoming less competitive than natural gas-fired combined cycle plants. In fact, utilities are increasingly looking to switch to the more efficient combined-cycle natural gas-fired generation as they seek to comply with the potential federal greenhouse gas legislation and the other pending emission reduction regulations. Power suppliers will need to evaluate how to address compliance with emission control retrofits, repower with natural gas or alternative fuels or prematurely retire some of their coal-fired capacity.

Most of the recent retirement announcements have been accompanied by plans to replace retired capacity with natural gas-fired combined-cycle facilities or repower the facilities with natural gas. Consequently, the extent of the resultant uplift in natural gas demand from coal-plant retirements is surrounded by many uncertainties.

NATURAL GAS DEMANDS

Our analysis suggests that incremental natural gas demand from power generation in North America could see an increase of over 20 percent increase in the long term as a result of implementing a moderate carbon policy and more stringent multi-pollutant EPA regulations, in addition to the otherwise expected gas demand growth. By 2030, this translates to upwards of 5 billion cubic feet per day of additional gas demand, given the retirement of 70 GW of coal plants, under this moderate long-term scenario.

As far as identifying which power plants are most at risk of being retired, the regional nature of power markets complicates the outlook. In regions where coal-fired generation dominates the resource mix, retirement decisions will have to be accompanied by plans for replacement with low-emission resources. Currently, most of the regional markets in North America have ample reserve margins and are expected to remain overbuilt in the short and medium terms, offering large amounts of new efficient natural gas-fired generation currently running at low utilization rates and readily providing some replacement potential. Such potential would typically be limited by the availability of sufficient transmission access for the gas-fired resources into the load centers.

Wind resources, which have been the

dominant choice for renewable energy growth, also pose a direct threat to coal-fired generation for several reasons including their very low production costs. Furthermore subsidies such as the Production Tax Credit (PTC) and other financial instruments like renewable energy credits (RECs) will allow wind generators to provide their output at low prices, thereby displacing some of the coal-fired generation.

The growing reliance on wind generation can also further benefit natural gas. The intermittent nature of wind energy depends on back-up from flexible resources with the ability to cycle more frequently, a characteristic of gas-fired generators which increases competitive pressures on coal plants.

While the outlook for much of the existing fleet remains in doubt, several factors could limit the amount and schedule of coal-fired plant retirements, such as regional and local reliability concerns, the cost impacts to wholesale power markets and ratepayers, the location of some of the existing coal plants and their role in maintaining grid stability and reliability, as well as decommissioning and replacement costs.

Although many questions still remain unanswered, Wood Mackenzie concludes that for now, coal remains squarely in the crosshairs.

FARAG BIO

Hind Farag is Wood Mackenzie's North America Power Research Services Manager.

She leads the team responsible for developing the semi-annual long-term and monthly short-term views of the North American power markets, topical and regional insights and analyses, the Power Valuation Tool and other power research offerings.

Hind provides consulting and analytical services pertaining to regional market assessments, fundamental energy market analyses, wholesale price forecasting and asset valuations using production cost modeling software applications.

Hind has over ten years of experience in fundamental power market analysis, wholesale price forecasting and generation asset valuations throughout North America. In addition, she has extensive experience with analyzing the regulatory framework and fundamentals of the Midwest, Southeast and ERCOT power markets.

Hind holds an MBA and a Bachelor of Business Administration, both from the American University in Cairo, Egypt, and is based in Wood Mackenzie's Houston Office.



PERSPECTIVE



WHY PAY DIVIDENDS?

BY JAY RHAME, CFA

“More money has been lost reaching for yield than at the point of a gun.”
Raymond F. Devoe, The Devoe Report, February 1995.

While this phrase has become a long-time resident in the pantheon of investing clichés, our experience has shown that reaching for dividend growth can be a valid

and successful investment strategy in the capital intensive utility industry. The annualized return for the S&P Utility Index, including dividends, for the past five years ending March 21, 2011 was 3.8%. The average annual return for the 19 stocks in the index that raised the dividend every year was 8.3%; the return for the stocks that

either paid no dividend or did not raise the dividend each year was only 0.7%. More notably, the ten stocks that raised the dividend by at least 5% annually delivered a powerful annualized return of 10.2%, besting the index by 6.4% and the S&P 500 by 8.2%.

DIVIDEND POLICY?

Although every company has its own story, the common denominator is the dividend policy. Each company follows a policy of a moderate payout of earnings combined with annual increases that tracks the growth of net income. When the dividend is prioritized, new business and project development historically faces a higher hurdle. This policy cultivates a capital deployment discipline process in which only the best projects survive. The result: regulatory relationships are stronger, customers' rates are lower, and regulatory outcomes become more consistent. More importantly, a company that has the ability and the willingness to adopt a policy of raising the dividend annually also tends to enjoy a lower cost of equity; the stock is usually less volatile and trades at higher multiples of book value. A lower cost of equity furthers the virtuous cycle of lower overall financing costs, providing an even stronger tailwind on rates and regulation. With stronger regulation, investors often are more confident in the utility's ability to continue the pace of annual dividend increases and apply a higher valuation to the stock.

Much of this flies in the face of traditional finance. Standard textbooks state that there is an inverse relationship between the amount of dividends paid and the growth of shareholders' book investment; we disagree. While certainly limiting the amount of dividends paid can lower a company's financing requirements modestly in the short term, the positive feedback loop, created by a rising stream of dividends, on the equity cost of capital more than offsets the initial cost for companies with a recurring need for equity financing.

SHARE BUYBACK

A share buyback provides similar capital allocation discipline in the short-term but fails in the long-term. A dividend policy means that management has to allocate a growing stream of cash to pay shareholders each year, which may be a big factor in long-term project planning. On the other hand, a company can easily cut the amount of share buyback whenever cash is needed for a big project. A dividend also forces management to re-think issuing equity to pay for capital projects. Each newly issued

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MANY COMPANIES WILL BE BOUGHT THIS YEAR; IS YOURS ONE OF THEM?

BY JEAN-MICHEL GAUTHIER



In spite of the continued concerns over the strength and sustainability of the global economic recovery, the flow of mergers and acquisitions (M&A) transactions within the renewable energy sector continues unabated, with only challenges such as access to capital remaining. As the recession took hold in 2008 and 2009, many lenders reigned back their M&A activities and completely backed away from making risky investments. With financing slowing to a trickle, lenders worked hard to reduce their exposure to the sector, resulting in an almost complete shutdown of the M&A renewable energy market. For most of 2009, governments around the world introduced various stimulus measures, including major injections of capital, which were designed to jump-start renewable energy projects. As a result, there now appears to be increased M&A activity, which is likely to continue over the next 12-18 months. Despite the fact that many companies are finding it harder to locate adequate capital, global deal volume within the renewable energy sector has recently improved. This may be as a result of investors being forced to rely more on balance sheet financing in order to bring a deal to a successful conclusion. Perhaps the most important observation to be made over the last six months is the increase of investments in solar compared to wind. In 2009, investments in wind power considerably exceeded those made in solar. Wind and solar have now reversed position; although there is no doubt that together solar and wind will drive deal activity going forward. The challenge now for renewable energy players will be to compete against other forms of energy investment, such as other forms of generation, infrastructure, unconventional gas, liquefied natural gas (LNG) and oil and gas pipelines. Growth in renewable energy will not continue to increase unless money is readily made available. There is fierce competition to gain access to lending and with available government stimulus packages

beginning to wind down, industry players are questioning where the capital will come from. One solution comes from a new wave of companies – particularly from Korea, such as the state-owned Korea Finance Corporation – that seem ready to invest in renewables. Sovereign wealth funds from Asia and the Middle East may also provide some much needed financing in the sector. One important trend involving current M&A activity is that governments' involvement in certain industries –and renewable energy is one of these – will entail more rigorous scrutiny of the implications of proposed deals. This suggests that renewable energy companies could face an uncertain M&A environment, leading to delays in deal completion and potentially deal cancellation.

To prepare for this new deal landscape, companies operating in the renewable energy space should consider the following.

STEPPING UP TO NEW DEMANDS

The situation in the global marketplace calls for adjustments in how companies approach M&A deals. Firms that regularly make acquisitions are experienced in dealing with the interplay between numerous agencies within the government. They have access to key decision makers and know the rules in areas such as governance, taxation and industry regulation. They are accustomed to the challenges that arise when seeking approval for proposed deals. However, deals in renewable energy are becoming more complex and politically sensitive and will likely require new management skills.

CLEAR ASSUMPTIONS

Firms will need to be clear about their assumptions as to how government policy will affect their investments and anticipate circumstances that could help or hinder achievement of their strategic objectives. This is not to say firms are obliged to react to events as they occur. Executives can plan investments in ways that make provision for alternative outcomes – called 'strategic flexibility' –while working to move policy in favorable directions. This strategy has implications for the way renewable energy deals are planned, managed and pursued.

EXECUTIVE CAPABILITIES

Maintaining competitive advantage requires that the executives in charge of

M&A strategy and execution have a special set of skills. One theory is that the global marketplace is tilting toward a more politicized marketplace, but it should be noted that much remains uncertain as to how events will play out. Companies may want to allow for the reality that events will unfold differently in different national markets. Consequently, executives directing M&A deals will need to possess political as well as commercial expertise and they will also have to be able to cope with ambiguity and change.

BOTTOM LINE

Consolidation is inevitable as companies jostle for industrial competitive supremacy by reducing competition, costs and operational overlap, creating new synergies by expanding into new markets. However, current M&A activity will likely remain politicized in the foreseeable future, and those with the right skill set should find it easier to work in the new deal environment. "As renewable energy projects become more politicized, executive skill sets necessary to carry out M&A transactions will require more long-term refinement."

Jean-Michel Gauthier is the Global Leader for Financial Advisory Service, Deloitte Touche Tohmatsu Limited.

DANIEL POTASH CONTINUED FROM PAGE 14

wrestling with how to plan in a market context. Some policy makers are wrestling with why to plan in a market context. The old reason to plan was so that the regulated entity fulfilled its promise as part of its regulatory compact. Most people might agree that new reason to plan is to assure that there is enough electricity. What is not agreed upon is whose responsibility it is to assure there is enough electricity. Responsibility for power supply or service can be further broken down: who is rewarded, punished, subsidized, mandated, licensed, and so forth. And, there has to be vibrant and timely implementation of the rewards and punishments.

PLANNING AND RESERVE MARGINS

The data would indicate that reserve margins are becoming more volatile. The graph of data from the Energy Information

Agency shows that total U.S. reserve margins dropped from 21% to 15% in one year in the time period 2004 to 2005. The previous similar decline took a little more than six years, 1991 to 1997 and 1998. Since 2006, reserve margins climbed back up as financing became easier. Clearly change in reserve margin is happening faster. This should not be surprising as a power markets become more complex.

Some enterprising academics should delve into the relationship between reserve margin and investment to dig into the anecdotal stories about investment in new plant drying up in pools such as NEPOOL and PJM. In California we have been saved in the power sector by economic collapse and so far fewer new power plants have been needed.

MORE VOLATILITY IN BASIC COMMODITIES

Another factor making integrated resource planning more difficult is more volatile commodity prices. Consider the price of copper in the chart. As a planner trying to forecast power generation prices, dealing with this kind of volatility is nearly impossible. As an example of the impact of commodity cost volatility, the wind projects I worked on in 2003 in the U.S. seemed expensive at just over \$1,000 per kW. Now we are up at near \$2,000 per kW in normal markets where most people work, and very much over \$2,000 in more remote risky markets.

INTEGRATED RESOURCE PLANNING IN THE FUTURE

The key problem with integrated resource planning in 2011 is relevance. Integrated resource planning as a diagnostic appears perhaps excessively popular. Policy makers need to decide what rewards and what punishments should fall to which stakeholders. For example if a distribution company is responsible to serve customers, it should be able to procure power at whatever price is necessary to meet the service standards set. For a generation company it should be able to match financing with power sales to keep risk in balance.

Since we have broken up the power sector into component pieces, policy-makers may wish to not make an elaborate integrated resource plan unless they are also going to implement measures that make the plan meaningful. Or there could be a recognition that power sector unbundling and market pricing can sometimes lead to uncomfortable results.

PERSPECTIVE

M&A TORYS' TOP CONTINUED FROM PAGE 15

arrangement. This would ordinarily mean three levels of approval: (i) a decision by the board that the transaction was in the best interests of the corporation; (ii) an affirmative vote by shareholders evidencing their view, as the directly affected securityholders, of the fairness of the transaction; and (iii) a decision by the court that the transaction was fair and reasonable.

Very unusually, the board made no threshold determination that the transaction was in the best interests of Magna. The board simply determined that it would be in Magna's best interests for the transaction to be put to shareholders for a vote. This was unusual because a fundamental change transaction is normally not put to shareholders for approval unless and until the board has determined that the transaction is in the best interests of the corporation.

After the Magna arrangement transaction was approved by a substantial majority of shareholders, the court approved the transaction as fair and reasonable. In reaching this conclusion, the court relied principally on the shareholder vote and on what the court described as the "principle of corporate democracy," according to which "a vote of affected shareholders is a recognized means of addressing controversial transactions." This endorsement of shareholder primacy is hard to reconcile with the stakeholder view of the corporation promulgated in BCE according to which the interests of the corporation are not to be equated with shareholder interests.

These decisions leave Canadian corporate and securities regulatory laws in a state of incoherence on the relative roles of the board and shareholders in transformative transactions. The logic of BCE suggests that it would be wrong for the board simply to defer to shareholders or to give shareholders a veto over decisions for which the corporate statutes assign responsibility to the board. However, what BCE suggests would be wrong is what the courts and securities regulators endorsed in Magna. Neither the courts nor the securities regulators have faced up to this contradiction. Until they do, Canadian law will be unpredictable. However, the lesson in the meantime for Canadian boards struggling with controversial transactions would appear to be: when in doubt, let the shareholders decide.

4. TARGET BOARDS WILL CONSIDER MORE AGGRESSIVE DEFENSIVE TACTICS WHEN FACING A HOSTILE BID

By Thomas Yeo, Sharon Geraghty and Joris Hogan

Two well-known Canadian companies dominated the M&A headlines last summer and fall, one as the hunter and one as

the hunted. Although the outcomes in both situations were similar – hostile bidders turned away – the cases highlight an important question: whether directors of Canadian companies facing a hostile bid find themselves with a relatively empty toolbox compared with directors in other jurisdictions.

The Canadian approach: "There comes a time when the pill must go" Securities regulators in Canada have long held the view that the best approach in a hostile bid is to have an unrestricted auction for control. They regard this approach as consistent with their mandate to protect the interests of investors – shareholders should not be deprived of the ability to sell their shares as they see fit. The securities regulators make clear in their national policy on defensive tactics that these tactics may be used only "in a genuine attempt to obtain a better bid."

The regulators have the power to pull the plug on rights plans, the most commonly used Canadian defensive tactic. The regulators' approach, however, is hard to reconcile with the Supreme Court of Canada's interpretation of the duties of directors in a change-of-control situation. In the BCE decision in 2009, the Supreme Court expressly rejected the notion that the directors' only role in a change-of-control transaction is to maximize value for shareholders; the Court instead reiterated the principle that directors' duties are owed to the corporation and that directors must consider the impact of a transaction on all stakeholders. Although the BCE decision certainly suggests that there may be appropriate circumstances for a board to "just say no" and employ defensive tactics to turn away a hostile bidder, rather than simply to buy time to find a white knight, the securities regulators are likely to reject that board decision and turn the decision regarding the company's future over to the shareholders.

Rights plan decisions of the Ontario and Alberta securities regulators (in Neo Material Technologies and Pulse Data, respectively) suggested that perhaps the old way of thinking about defensive tactics may be changing in light of BCE. In both those cases, securities regulators refused to cease trade a rights plan in the face of a hostile bid. However, in both cases, shareholders, with full knowledge of the hostile bid proposed to them, voted to ratify the rights plan. The OSC's most recent decision in the Baffinland Iron Mines case, however, makes clear that its previous Neo decision turned on shareholder approval of the plan in the face of the bid and should not be viewed as recognizing any right of the board to use a poison pill to deny shareholders access to a bid. The decision of the British Columbia Securities Commission in Lionsgate is also unequivocal in its conclusion that the position of securities regulators in Canada should not change as a result of Neo and Pulse Data and that there will always come "a time when the pill must go."

We expect that directors facing a hostile bid will continue to try to test the "old" thinking of securities regulators by attempting to keep rights plans in place longer or by obtaining shareholder approval of plans in the face of a hostile bid.

We also anticipate that boards and their advisers will look to develop innovative defensive tactics that, unlike rights plans, are not susceptible to the cease trade powers of securities regulators and that would require intervention by the courts. The courts are a preferable venue for targets to defend defensive tactics since courts are more likely than securities regulators to be deferential in their review of target board actions, particularly in light of the new fiduciary duty framework established in the BCE decision.

Foreign takeovers of domestic companies are a rising concern in all jurisdictions, particularly as the global financial crisis has made targets vulnerable to opportunistic buyers.

In the United States, directors have the well-known "Revlon duty" to maximize shareholder value, but that duty arises only after a board has made a decision to sell control of the company. Until that decision is made, the board is free to implement defences against a takeover bid, including adopting a rights plan or a panoply of other "shark repellents." However, in Delaware and most states, the Unocal "enhanced scrutiny" standard applies to a board's action to implement or amend a rights plan after the company is put in play by a third-party bidder or by a board decision to sell a controlling interest in the company. Under this enhanced scrutiny standard, in order to receive the protection afforded by the business judgment rule, the directors must show that they had reasonable grounds to believe that a danger to corporate policy and effectiveness existed and that the defensive response was reasonable and proportionate to the perceived threat.

Unlike the Canadian securities regulators, the U.S. Securities and Exchange Commission has stayed out of the regulation of defensive tactics, leaving them to the courts to police as a matter of fiduciary duties under applicable state laws governing the fiduciary obligations of directors. The SEC has instead focused on ensuring that shareholders have adequate information with which to make a decision.

5. THE SPOTLIGHT WILL SHINE MORE BRIGHTLY ON SHAREHOLDER VOTING PROCESSES IN M&A

By Patrice Walch-Watson and Andrew Beck

Shareholders are increasingly exercising their voices, in some cases after pushing for the right to do so, in corporate decisions ranging from matters such as "say on pay" to endorsing or rejecting M&A transactions and the continuance of shareholder rights plans, to replacing

directors who are not to their liking. We see this activism continuing in 2011, accompanied with a new focus on the mechanics of the proxy system in Canada and the United States. Interestingly, what we also began to see in 2010 was the corporate world pushing back against what it considered to be the growing and inappropriate influence of proxy advisory firms on the way shareholders exercise their votes. We believe this movement will gain more momentum in 2011.

SHAREHOLDERS REMAIN KEENLY INTERESTED IN GETTING THEIR VOICES HEARD

To see how shareholder activism thrived in Canada and the United States in 2010, you only have to look at Carl Icahn and his list of recent proxy fights. Even institutional investors such as pension funds are becoming increasingly active owners in both governance and financial matters.

A number of factors are behind this activism: Shareholders are being given more opportunities to vote as a result of stock exchange or securities laws that give them more legal tools and require their approval for an increasing scope of matters. The evolution of corporate governance best practices is also leading more companies to seek their shareholders' views on matters that had previously been outside shareholders' sphere of influence – in Canada, for example, "say on pay" and corporate social responsibility agenda items (see Trend 3, above, on the role of directors versus shareholders). Shareholders are also seeking more influence through negotiations with companies and, failing that, through requisitioning shareholder meetings to force consideration of matters of concern to them. Activists are feeling more confident, with the assistance of experienced advisers who are gaining new-found prominence in launching proxy battles to force boards to listen to shareholders' views. This trend shows no sign of abating.

PROXY VOTING SYSTEM FLAWED?

Shareholder voting in public companies relies on proxy voting. Significant attention has been paid to the U.S. and Canadian proxy systems of late. This has resulted, in part, from the SEC and then the Canadian Securities Administrators inviting general comment on their respective proxy regimes in response to industry and investor interest in updating the rules to promote greater efficiency and transparency in the systems and to enhance the accuracy and integrity of the shareholder vote.

Market participants in the United States and Canada have spoken loudly and clearly, questioning whether the proxy voting system itself is broken.

JAY RHAME

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share of stock requires more cash to be set aside for the dividend payment. Investors can be confident that a utility will only issue new equity if the money is being invested in a low risk, high return project as long as it has a sensible dividend policy.

From an absolute yield perspective, utility dividends remain very attractive. The U.S. Government ten-year Treasury currently yields 3.5% versus an average yield of 4.3% for the S&P Utilities Index, which includes two companies that do not pay dividends.

Utilities that raise their dividends have a distinct advantage in the event of inflation and rising interest rates: rising coupons.

There are other points of attraction as well: the extension of the Federal government's preferential tax treatment and the longer term dynamic of yield demand as more and more baby boomers retire.

LONG TERM INVESTMENTS

One other thought worth considering: dividends provide the investor with quarterly cash flow that can be continuously used to reinvest in stocks. Over the long-term, these reinvested dividend payments are a vital element of return.

Since the beginning of 1981 through the end of 2010, the price performance of the Dow Jones Utility Index is only 253.9%. This compares unfavorably with the price return of the S&P 500 Index of 826.4%. However, when reinvested dividends are considered, the total return of the Dow Jones Utility Index comes out slightly ahead of the S&P 500 – with a much lower level of risk.

Amazingly, slow growth utilities have kept pace with the 500 leading American companies over the last 30 years because of dividends.

We believe that selected utilities with the willingness and ability to regularly grow dividends should continue to provide competitive risk-adjusted returns over the long haul.

About the author

Jay Rhame is a Vice President and Analyst at W. H. Reaves Asset Management. This year Reaves is celebrating its 50th anniversary. The company has a 33 year history of successful investment in the utility, telecom, and energy sectors. Jay is a CFA charterholder.

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environmental issues, in addition to energy issues. Indeed, not only is this the first Five-Year Plan that mentions climate change, but it is mentioned at the top of the environmental section. There is also a full paragraph detailing China's commitment to international cooperation and the UN-led climate negotiation process, including concerns of climate finance and technology transfer. The Plan also discusses the need to implement more climate adaptation-related policies, such as greater preparedness for extreme weather events.

ENERGY AND CLIMATE TARGETS:

There are separate targets for energy intensity (16 percent reduction by 2015) and CO₂ emissions per unit GDP (17 percent reduction by 2015). These are within the expected range and congruent with the 40 to 45 percent reduction in carbon intensity from 2005 levels that was first announced in the Copenhagen talks and reaffirmed in Cancun this past November. Clearly defined and distinct energy and CO₂ emissions targets will help ensure provinces implement energy policies with carbon goals clearly in mind. Somewhat surprisingly, there was no mention of a total energy consumption target, which was recently announced by China's former Minister in charge of the National Energy Administration, Zhang Guobao. It will be interesting to see whether this emerges in the specific energy-sector plan that will come later this spring.

The draft Plan and Work Reports also include noteworthy policies in:

FORESTS

China has been steadily increasing forest cover since the founding of the People's Republic in 1949. This next five year plan goes a significant distance toward meeting China's Copenhagen commitment on forests. In the Plan itself, the Chinese government set a goal to increase the area of forest cover by 12.5 million hectares by 2015, while in Premier Wen's Work Report, he announced a forest stock volume goal of 600 million m³. While the forest cover area goal seems more or less in line with the already stated 2020 goal to increase forest cover by 40 million hectares over 2005 levels, the volume stock target seems more ambitious because it seeks to achieve almost half of the 15-year target of 1.3 billion cubic meters by year 2020.

TRACKING IMPLEMENTATION

To achieve these climate and energy targets, the level of detail and specificity, covering a full range of resource and environmental issues, provided in the Plan and the Work Reports are impressive. Premier Wen stated that China would put in place "well-equipped statistical and monitoring

systems for greenhouse gas emissions, energy conservation and emissions reductions" to ensure these policies are tracked and properly implemented.

EFFICIENCY

China has had a particularly successful track record on industrial energy efficiency in the previous five years. In the new Plan, there are both new policies to promote greater industrial efficiency, and a major push to include all other sectors of the economy, including both new and existing buildings. For example, the Plan introduces a 10,000 Enterprises Program. While we don't have details as to what this program will be, it appears to be a ramp up of the successful Top 1,000 enterprises program. We'll certainly be following this development closely in the coming months. Following the endorsement of new types of mechanisms in the October Party Plenum Document, the Plan specifically endorses market approaches like energy service companies (ESCOs) that help to finance energy efficiency.

TRANSPORT

While China certainly has plans for additional air and road transport, what is striking is the commitment to rail, both long distance and in urban mass transit. The Plan includes proposals for the construction of 35,000 km of high-speed rail and a goal to connect every city with a population greater than 500,000. There are also plans to improve subway and light rail in cities that already have urban transit systems, building new systems in at least nine other cities, and making plans for six or more cities. We expect to see more detail and perhaps more cities as the sector-specific plan becomes available.

NON-FOSSIL ENERGY

The Plan incorporates the goal of 11.4 percent non-fossil fuels in primary energy consumption by 2015 announced by Zhang Guobao last month. China continues to exceed earlier targets in non-fossil development. For example, the five-year target for wind is 70 gigawatts of additional installation, which exceeds the 2020 target of just a few years ago. For nuclear, the plan is to install 40 additional gigawatts of capacity by 2015. China currently has around 10 GW of installed nuclear capacity now, which means that if this five-year target is achieved, China is likely to exceed even the expectation of 70 GW by 2020 discussed a year ago. If China achieves these numbers, it will have the world's highest installed capacity of nuclear energy by 2020.

ENVIRONMENT

The Plan itself does not make clear the specific targets for major environmental pollutants. However, they were all announced at an official NPC-connected press conference. On March 6, Zhang Ping, Director of the National Development and

Reform Commission, stated that the reduction targets for Chemical Oxygen Demand (COD) and Sulfur Dioxide (SO₂) are 8 percent, while ammonia nitrogen and nitrogen oxides are 10 percent. Director Zhang also said that these targets would be made binding for the first time in the 12th Five-Year Plan, as well as an "index evaluation system" implemented to allocate targets to provinces and ensure they are on track to meet reductions. We are not clear on exactly how these targets will be made binding, whether there will be additional documents at this NPC, or whether they will be binding in a later sector-specific plan.

While the Plan itself is general on targets, it is much more specific on policies. It assigns specific targets for cities required to reach new motor vehicle emission standards and sets goals for a wide variety of environmental infrastructure, including wastewater and solid waste treatment. There is also a strong emphasis on reuse and recycling, or what the Chinese call "circular economy."

China is a middle-income, developing country and the next five years is when it needs to put in place the infrastructure that will enable it to develop successfully into a high-income developing country and beyond. There's a clear recognition in these plans of the importance of environmental sustainability in being able to reach not just higher levels of income and but also increased welfare of the Chinese people. The Plan itself is highly specific in some areas but also in others somewhat unclear (for instance, target pollutants). Much of the clarity in implementation comes through sectoral plans and later regulations and guidance. WRI will continue to track policy implementation as it unfolds.

The World Resources Institute is an environmental think tank that goes beyond research to create practical ways to protect the earth and improve people's lives.

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Prior to joining WRI, she served for over 20 years in the U.S. State Department, where she worked on energy and environment issues in China, India, Nepal and New Zealand. Her most recent position was as Environment, Science, Technology and Health Counselor on Beijing. She has a master's degree from Princeton University's Woodrow Wilson School in Science, Technology and Environmental Policy, and her BA is from Harvard University in East Asian Studies. She speaks fluent Chinese and some Hindi.

PERSPECTIVE

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In the '90's, PWR had a demo solar plant installed with the Los Angeles Department of Water and Power and with DOE on the Solar Two Project, a 10 megawatt pilot facility using a Concentrated Solar Power Tower with thermal storage. The CSP Tower technology uses thousands of articulating mirrors, tracking the sun and reflecting solar energy to a receiver mounted on a 600 foot tall tower. Liquefied molten salt is circulated into the receiver, where it is heated to about 1,000 degrees Fahrenheit, then stored in a large insulated tank. Molten salt can be stored for days with little heat loss. PWR provided the worldwide exclusive license to Solar Reserve.

Solar Reserve LLC, headquartered in Santa Monica, CA, is a solar energy project development company developing large-scale solar energy projects worldwide. Since its formation in late 2007, Solar Reserve's team of power project professionals have assembled a concentrated solar power development portfolio of more than 25 projects featuring its licensed solar power technology with potential output of more than 3,000 megawatts in the United States and Europe with early stage activities in other international markets. Solar Reserve' experienced management team has previously developed and financed more than \$15 billion in renewable and conventional energy projects in more than a dozen countries around the world.

Solar Reserve's lead projects in the U.S. include the Crescent Dunes Energy project in Tonopah, Nevada and Rice Solar Energy project in Riverside County, California. Both projects are set to break ground in 2011. The projects will generate more than 1,110 on-site construction jobs.

The 110 megawatt Crescent Dunes Solar Energy project located in Nye County, Nevada was designated by the Department of Interior as a fast-track applicant for right of way use of federal lands managed by the Bureau of Land Management. The project secured a 25 year power purchase agreement with NV Energy.

The 150 megawatt Rice Solar Energy project in Riverside County, California secured a 25 year power purchase agreement with Pacific Gas & Electric Company.

Solar Reserve applied for participation in the Loan Guarantee Program under the DOE's July 2009 solicitation for innovative renewable technologies pursuant to Section 1705 of the Energy Policy Act of 2005. Both projects successfully advanced through Parts I and II of the DOE's extensive application review process. DOE and Solar Reserve are advancing the arrangements for the financing terms and conditions available under the DOE's Section 1705 program.

"We currently have no ownership interest in Solar Reserve, but we are supporting them to get a DOE loan guaranteed," Maser said. "We have an exclusive source of supply and they've provided additional funding for engineering activity."

In June, 2010, PWR received a \$10.2 million award from the DOE to lower costs and increase CSP Power Tower capacity using PWR's engineering expertise to optimize system performance and efficiency and using advanced manufacturing techniques that better absorb energy.

GASIFICATION MATURES

"In parallel we're working other technologies such as coal gasification and we're in the process of maturing that technology," Maser added. "We've done a pilot plant, running over seven hundred hours at the Gasification Technology Institute in Illinois."

GTI is advancing coal gasifier technology with Pratt & Whitney Rocketdyne for fuels, chemicals and power generation applications. PWR installed a pilot plant scale advanced compact gasifier at GTI's Advanced Gasification test facility in 2009.

Commercial versions of the new gasifier will be about one-tenth the size of competing technologies. Drawing upon PWR's expertise from rocket engine development, the design enables rapid start-up and shut-down and will be able to operate with all ranks of coal.

The PWR technology is expected to result in high energy conversion efficiency, consuming up to 25% less oxygen in the process. Cost for electricity generation and chemicals production is anticipated to be 15 to 25 percent lower compared with existing gasification technologies and the compact size and advanced design features will enable high availability.

With funding from PWR and its partners, GTI is conducting pilot-scale development testing of the advanced coal gasifier with a variety of feedstocks in the AGTF, including PWR's ultra-dense phase feeding system, rapid-mixing injector, and advanced syngas cooling technology.

PWR's partners include Exxon Mobil, DOE, and Alberta Energy and Environment Solutions. "A combination of outside investors and ourselves has invested close to \$100 million in gasification over the past 3 to 4 years," Maser shared. DOE's funds were matched. Maser sees a huge gasification market in China and India and is talking to a number of Chinese companies but no formal agreements have been signed to date.

"We're close to being on the cusp of something fairly big here," Maser said in conclusion. "We're looking to start generating revenue from CSP later this year. The other portions of the energy portfolio could start generating significant growth in the 2018-20 time frame and we believe that growth could become a third of our revenues in the early 2020's."

PRATT & WHITNEY POWER SYSTEMS



Peter Christman, President, Pratt & Whitney's Power Systems with Dick Flanagan

World-Gen asked Maser why PWR didn't integrate the new niche energy market products into Pratt & Whitney Power Systems. "First of all, our assessment of the solar market is relatively conservative and, having the entire plan under PWPS, presented a relatively high amount of risk," Maser answered. "As a team we decided PWPS should back out of this. With other technology, I think that's still a potential model."

PWPS

World-Gen also interviewed Peter Christman, President of Pratt & Whitney Power Systems on P&W's Media Day in Florida. The PWPS portfolio presently includes the FT8 SWIFT PAK, Organic Rankine Cycle and Clipper Windpower. "The FT8 can be twin-packed for 60 megawatts," Christman said. "A new FT400 will be announced later this year." PWPS has more than 2,000 industrial gas turbines installed in over 50 countries worldwide.

"We had taken over ORC technology incubated at UTC Power called PureCycle Power System unit, using the ORC cycle, which is about a 250 kW machine. We liked the space for geothermal, biomass, and industrial waste heat processes," Christman underscored. "We decided to make a majority investment in Turboden, an Italian manufacturer of ORC systems for over 30 years. The strategy behind the acquisition was they had a number one market position in Europe and we could leverage that position to the rest of the world."

PWPS offers a full range of maintenance, overhaul, repair and spare parts for other OEM'S and has offices in Russia and India.

"In Russia, we have 10 people in the Moscow office and 20 service technicians in other parts of Russia," Christman said. "They are chartered to sell our entire portfo-

lio of products but we've gotten good traction on both OEM equipment and aftermarket."

In India, the Delhi office provides repair services and repairs virtually any of the frame types by Siemens, GE and others. "So as gas turbine technology continues to get penetration in the India market, the Indian market is looking for alternatives to the OEM," he said. "Right now the work gets sent out of the country. We have a repair shop in Singapore that's where we do the work. If we get to the point where there's sufficient in-country volume, we would look to invest."

CLIPPER ACQUISITION

PWPS acquired the balance of Clipper shares in December, 2010. "We have a facility in Cedar Rapids, Iowa and Denver, which is really a nucleus for field service support," he said. About 500 Liberty turbines were sold, and another 250 will be installed this year."

World-Gen asked him to size up the market. "I think it's a market that's evolving fairly rapidly, although the U.S. market has been tapped down the last year and a half or so, markets outside of North America continue to grow at a fairly robust pace. There's competition in this space, a lot of people in it, but we believe ultimately that there's some technology that resides within UTC where we can differentiate ourselves from others. And that's where we intend to go".

Clipper announced a program to do a 10 megawatt turbine for offshore application in the U.K. Since UTC acquired the business, that program is currently under review. Christman said a decision would be reached within 90 days about its future.

Pratt & Whitney is a United Technologies Company, based in East Hartford, CT.

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