



PIRA's North American Electricity Retainer

A service that keeps clients updated on developments in the Eastern and Western North American electricity markets, while providing fundamental market analysis, market intelligence, and superior client service.

Components of the Electricity Retainer:

Western Grid Electricity Market Forecast

Sent to clients monthly in advance of electricity futures contract expiration and geared for companies that value a comprehensive analysis of the fundamentals driving power prices and inter-related fossil fuel markets. PIRA uses its proprietary energy and capacity models in preparing these outlooks. The *Western Grid* describes the fundamental analysis driving PIRA's 12-month projections for bulk power prices at Mid-Columbia (WA), California-Oregon Border (COB), SP-15 and NP-15 (California), and Palo Verde (AZ). Assumptions about supply (including hydro, nuclear, and gas-fired generation) and demand are explained, as well as their effects on natural gas markets and impact on generation.

Eastern Grid Electricity Market Forecast

Like the *Western Grid*, the *Eastern Grid* forecast presents a fundamental analysis of the factors driving PIRA's 12-month forward price outlooks for multiple delivery points in the eastern markets, NEPOOL; NY: Zones J, G and A; PJM-W; Ontario, Canada; into Cinergy; into Com Ed; MAPP North; into TVA; Florida Border; into Entergy; and ERCOT South.

U.S. Coal Market Forecast

Monthly market outlook that provides analysis and data on a wide range of issues affecting supply, demand, balances, and, ultimately, prices of coal in various U.S. regions (West, East, Midwest) and developments in metallurgical coal and related thermal markets. Coverage includes SAPP and Central Interior basins, several western basins (CO/UT, southern WY, MT and AK) and lignite basins. Features detailed tabular data (historical and forecast) and price forecasts for CSX rail-served CAPP product, NAPP (Pitt 8) product and 8,400 Btu/# SPRB product. A complement to both PIRA's regular power grid and emissions market coverage, the *U.S. Coal Market Forecast* explains the interplay of factors such as production, sulfur dioxide and nitrogen oxide credit trading, weather, transportation, natural gas competition, and the economy.

WESTERN GRID MARKET FORECAST
April 26, 2005

Western Grid Market Forecast

MARKET RECAP: RESTING UNCOMFORTABLY

Compared to the volatility and speculation that has beset recent months, and years, April 2005 will have to enter history as one of the most mundane on record. The normally dependable volatility in regional gas markets was lackluster, with the Southern California border enduring only three spikes as it trended down from the high to mid \$66/MMBtu range, while Henry Hub traded from the mid- to low-\$7/MMBtu. Other regional hubs also lost around 50¢/MMBtu as precipitation and runoff forecasts in the Pacific Northwest improved.

Possibly the most remarkable event of the month was the resilience in Western power prices as they remained range bound despite the weakening in gas prices. SP-15 pegged itself at \$60/MWh, +/- \$2.50/MWh, while Mid-Columbia and Palo Verde both traded in the mid-\$50s/MWh. As a result, implied heat rates in Southern California increased from ~8,400 Btu/KWh at the beginning of April to ~9,000 currently. Accordingly, California utility/divested gas-fired generation increased 200 MW from March levels, but remains more than 1,200 MW below last year's levels when implied heat rates averaged closer to 9,300 aMW while Diablo Canyon refueled.

Lower gas futures and the increased runoff forecast have taken a toll on 3Q05 power prices, with all Western hubs falling during the month. At Mid-Columbia, 3Q05 on-peak is currently priced at \$66.50/MWh, down \$8 from the beginning of April, while SP15 fell a similar amount to \$86.50/MWh—despite the CAISO citing summer reliability concerns. At this point, PIRA believes that reliability margins in California are at least as good as last year, with increased generation and transmission capacity more than adequate to meet the prospect of record demand.

With NOAA's Climate Prediction Center forecasting above normal temperatures across most of the west for the July-September summer period, and with the

U.S. COAL MARKET FORECAST
May 24, 2005

U.S. Coal Markets

SUMMARY: CAPPED OUT

- NYMEX-Spot Coal:** Low sulfur eastern coal prices held up well amid gas and oil price weakness, the tapering off of nuclear unit maintenance, and a 6.3 MMBt stock build in March (EIA May-05 Monthly Flash Estimate). With Henry Hub gas and \$2¢ allowance prices trading around \$6.35/MMBtu and \$809/sr respectively, as well as the summer ozone season in full swing (May - Sept. 2005), the penalty for running short of coal at an unscrubbed coal unit in the NO_x SIP region has dropped sharply. However, after a number of bullish supply-side developments, buyers remain extremely nervous. Stocks are at record lows, and will remain very tight throughout next winter. After finding multiple errors, the EIA revised January 2005 coal stocks down by a whopping 9 MMBt (9%). If that were not enough, coal production data for 1Q05 has confirmed that the strong 4Q04 showing for CAPP production was unsustainable. After 15 months of above \$40/sr pricing and relatively small supply response, CAPP production appears to be plateauing at best.
- Illinois Basin (IB) 11,200 Btu/lb Coal:** With 1Q05 IB production up marginally y/y, and the price of CAPP alternatives firming, IB prices have

SCOREBOARD

Market Issues: (Effect on price)

- App. Production: 🐄
- PIRB Production: 🐄
- Gas/Oil Markets: 🐄
- Nuclear Generation: 🐄
- Economy: 🐄
- Industrial Loads: 🐄
- Coal Gen. Capacity: 🐄
- Transportation: 🐄
- Int'l Markets: 🐄

Prices: PIRA vs. Market Consensus

- 3Q05 NYMEX: 🐄
- 4Q05 NYMEX: 🐄
- 1Q06 NYMEX: 🐄
- CV06 NYMEX: 🐄

Appalachian Coal Production: Near-final 1Q05 production data from MSHA shows only a marginal y/y increase in Appalachian production and PIRA expects much of that production to be metallurgical coal.

PIRB Coal Production: Transportation problems will shut in ~ 45MMt of PIRB production in 2Q05.

Gas/Oil Markets: Gas/oil markets have weakened in the past month but remain tight. A warmer than normal summer remains major upside risk to gas prices this summer, although recent weakness in gas prices may foster some coal to gas substitution.

Nuclear Generation: Fewer refueling outages over the remainder of this spring and fall will put downward



Regional Electric Load Estimates

PIRA gathers hourly demand and weather data in order to calculate changes in structural electric loads. The data include our estimates of weather-adjusted loads for three provincial power markets (Ontario, Alberta and British Columbia) and for nine U.S. ISOs/regions. In addition, the report provides sub-regional detail for those markets where we can acquire disaggregated load data (NYISO, PJM and ERCOT). It is released twice monthly (the first and third week of each month), roughly after we have collected half of calendar month's data and after we have gotten a full calendar month's data.

Market Updates

Prepared periodically to alert clients to changes in PIRA's western and eastern power market outlooks.

Phone/Email Access to PIRA's Electricity Group

An essential part of all PIRA Retainers, access to PIRA's staff allows clients to obtain quality analytical support on the latest developments in short-term supply and demand, facilitating a more productive use of their time. Clients can discuss PIRA's latest thinking on short-term electricity markets in the western or eastern grids, as well as long-term market information. Clients can also request research on special topics with a quick turnaround, and can arrange for conference calls with our market analysts.

PIRA Online

PIRA's Internet-based information service gives Retainer Clients exclusive, timely and convenient access to PIRA's analysis and price forecasts for North American electricity markets. PIRA Online is the easiest way for clients to take advantage of multiple-user, multi-site licenses. **Some of the reports and data available online include:**

- *Western Eastern Electricity Grid Report*
- *Eastern Electricity Grid Report*
- **Electricity Special Reports**
- *U.S. and Canadian Electricity Supply/Demand, Balances & Implied Heat Rates*
- *U.S. Coal Market Forecast*
- **NY Seminar Electricity Presentations**

New Generation Capacity Database

Tracks planned, under-construction, commercially in service, and retired generation in North America. Available upon request.

Strategic Briefings

Brings PIRA's senior consultants and clients together privately to discuss PIRA's latest thinking on short-, medium-, and long-term electric power markets. Briefings are designed to address each client's specific issues, assessing how markets impact their business and examining specific topics as requested.

Annual Retainer Client Seminar

Held every October in New York, the Seminar presents PIRA's medium- and long-term view of oil, gas, and electricity markets. Seminar attendees receive a detailed, 200+ page book on world energy forecasts by region and energy source through 2020, as well as presentation transcripts and slides. The Seminar also examines the major structural changes expected in various world energy markets. The event is an opportunity for clients and PIRA's staff to engage in dialogue on energy markets, as well as an ideal time for industry colleagues to connect with one another.



Discounts on PIRA's Other Retainers and Multi-client Studies

Electricity Retainer Clients get significant discounts when adding other Retainers (Global Oil, North American Natural Gas, European Natural Gas, European Electricity, and Scenario Planning Service) to their service package. They also receive discounts on PIRA's highly valuable multi-client studies; recent studies include *The Price of Reliability: The Value and Strategy of Gas Transportation* and *Atlantic Basin LNG: The Next Commodity Market*.

Fees

Existing PIRA Retainer Clients may subscribe to North American Electricity under discounted terms, which are determined by the scope of their current license. For prices and further information, please contact your PIRA Account Executive.

North American Electricity Group:

Allan M. Stewart (Executive Director) is responsible for the analysis of electric power and fuels markets and the servicing of PIRA's clients on electric power and related fuels markets. He oversees the preparation of a comprehensive series of commercially oriented assessments of North American electricity and fuels markets. Prior to joining PIRA, he worked with the Consolidated Edison Company of New York in a wide variety of senior positions involving supply acquisition, planning, business development, marketing, rates, engineering, and operations. For eleven years, Mr. Stewart was responsible for \$600 million of annual fuel purchases, off-system marketing, and strategic business planning. He is a recognized leader on North American coal and markets in energy fundamentals, has worked with the Bush Administration in formulating solutions to the then western energy crisis, and has testified numerous times throughout North America. He has a Bachelor of Science degree in civil engineering, an MBA in finance and investments, taken post-Masters coursework in economics at New York University, and completed Executive Management courses at Penn State University and IBM.

Morris J. Greenberg (Managing Director) has developed short-term and long-term regional electricity-pricing models based on detailed analysis of North American electric supply, demand and pricing. He has 20 years of experience in consulting, planning and finance, most recently as Vice President and Senior Energy Analyst at Lehman Brothers and Director of the WEFA Energy Group. Mr. Greenberg has a BS in Economics from the Wharton School, University of Pennsylvania and an MS in Economics from Temple University.

Bob Roth (Senior Director, U.S. Coal Market Forecast) constructs PIRA's long-term coal view for U.S. coals and collaborates to develop a short- and long-term view of international thermal coals that are fully consistent with the views on U.S. coals. Bob came to PIRA in 2008 from Louis Dreyfus Highbridge Energy Services, where he was Director of Coal Analytics. He was responsible for global coal and emission analytics within LDH Energy. Prior to LDH, Bob was Director of Energy Economics at Peabody Energy Corporation. He was responsible for the development of Peabody's U.S. coal demand model and analysis of the energy marketplace and regional coal markets. He holds an MS and a BS in economics from Illinois State University.



Roman Kramarchuk (Senior Director, Global Emissions) joined PIRA in 2005, coming from the U.S. EPA's Clean Air Markets Division, where he was extensively involved in the development of the Clear Air Interstate Rule, Clean Air Mercury Rule and the BART Guidelines for the power sector - with a special focus on cap and trade approaches to pollution control. Previously Mr. Kramarchuk worked in the merchant power sector, providing market analysis of power and natural gas markets with PG&E NEG. As a consultant with PA Consulting / PHB Hagler Bailly he helped evaluate power sector fuel choice, allowance prices, capital investments in pollution control equipment and generating unit operating decisions and advised clients interested in power plant development and acquisition, transmission expansion and asset valuation within various North American markets. Mr. Kramarchuk has also spent several years overseas, working on USAID and World Bank-funded projects to develop power markets, market rules and regulatory capacity in Ukraine, Armenia and India. Mr. Kramarchuk has a MPP degree from the Kennedy School of Government at Harvard and a BA in Economics and BSE in System Engineering from the University of Pennsylvania.

Dr. Sindhu Suresh (Senior Analyst) leads PIRA's development of optimal power flow models in addition to writing periodic reports on transmission developments. She has nearly nine years of experience in electrical, electronics and computer science fields, most recently with Spellman High Voltage. She holds a Ph.D., with a concentration in power engineering, from NYU and is also working towards a master's in financial engineering. Sindhu has received a master's in energy systems from IIT Chennai and a bachelor's in electrical and electronics from Kerala University, both in India.

Victoria Watkins (Director) focuses on short-term market fundamentals, contributing to the *Western Grid Market Forecast*. She came to PIRA from Pacific Gas and Electricity Company in 1996, where she carried out a wide range of market analyses, playing a key role in organizing development of the first wholesale electricity market index and NYMEX electricity futures contract for the Western U.S. Before PG&E, she served as a manager of power generation operations in the U.S. Air Force in the U.S. and South Korea. Victoria holds a BA from the University of Southern California and an MBA from Harvard Business School.