

CIBO Annual Meeting
Oct. 10 - 12, 2012
San Diego, California

I. Opening Session - John C. deRuyter, E.I. DuPont de Nemours & Company, CIBO Chairman

John C. deRuyter introduced the new members since last year. There were also some potential new members as invited guests. The usual “around the table” introductions were done. The first part of the meeting is the “official” part of the meeting to give the status of the organization. There is a broad agenda for this year’s meeting and member participation is encouraged. The theme for this year’s meeting is Industrial, Commercial, and Institutional Energy - the New Endangered Species. CIBO is well positioned to address the issues related to this concept. CIBO continues to be a well respected association that contributes thoughtful positions on current issues to both regulatory and legislative personnel. Our technical conferences were well attended in the past year. There are a lot of challenges going forward. CIBO will continue to provide a forum for our members to put forth ideas to meet those challenges and articulate those positions as the need arises.

II. Operations Reports for 2012 - CIBO Officers and Committees

Bob Corbin provided the Membership Report. Bob reminded everyone that pursuit of membership is a full time job and everyone’s job. **Candy Marriott** reported that there are now 117 members, split somewhat evenly between owners and suppliers. We gained 8 new members, but lost 16 members (mostly associates). The retention benchmark for associations is 88%. We have been consistently above that level for the past 10 years. This year, we were at 100% for owners and 76% for associates.

We continued focus group meetings this year. This activity was suggested over 3 years ago by the membership. Retention is key to keeping our membership at high levels. The weak economy as well as mergers and acquisitions were the primary reasons for losses this past year. Energy and environmental regulations have had a major impact on the owners. Fuel switching and cogeneration are the major types of projects being considered.

As the impacts to the owners are greater, the CIBO message needs to be broadened. Switching to natural gas will not necessarily resolve all environmental issues. Water issues may become the next big environmental issues. The CO2 issue is “warming up”. The environmental groups are not going away.

Input from the membership is a major factor in our efforts to attract and retain members. Prospect referrals are a major source of potential new members. One the sources of member feedback is the Annual Survey. The survey is sent out every year electronically to the principal members and is relatively easy to fill out. Once completed, the results from the prior year are sent so that the survey only needs to be updated in the next year. Major benefits were

keeping up to date with the plethora of regulations and networking with others on key issues. Natural gas rose to the top of the issues list. Suggestions have been to include energy efficiency and compliance strategies as part our meetings and conferences.

Lisa Jaeger, Bracewell Guiliani LLP provided the Litigation Report. Pending major rule challenges include the 2008 Ozone NAAQS, Boiler MACT Completion case, CSAPR Rehearing, GHG rules, Coal Ash RCRA, Utility NSPS GHG, MATS, RICE MACT, NHSM Rule, Boiler MACT, Area Source Rule, CISWI MACT, and the Boiler NSPS case. CIBO has participated or filed comments in 7 of these cases. CIBO is tracking the rest. All of these cases are some petitioner vs. EPA. These cases are proceeding during the next year. Most recently, EPA asked the full Court to rehear its vacature decision of the CSAPR rule. For rehearing cases, there is the potential for escalation to the Supreme Court.

As a result of all of these law suits, a number of major rules have been delayed. At least 10 rules are anticipated to be issued after the election. The consequence of the issuance of these new rules will be that more law suits will be filed next year. If any of the cases go to the Supreme Court, they will not likely be decided before 2014. With more law suits being filed, there will be a need for more comments and actions next year.

Carl Bozzuto, ALSTOM Power, Inc. provided the Treasurer's Report. In general, the finances for CIBO are sound. We have eliminated the Special Projects Fund and included the activities in our regular accounts. We were able to accomplish this by increasing the dues for the first time in 11 years. Membership still provides the major portion of our funds. As we have heard, there will be a significant number of new rules coming out shortly which will require our input. In order to put resources against these activities, we need to continue to attract and retain members. Membership is everyone's job.

Bob Bessette, CIBO provided the President's Report. The dues invoices will be sent out after the Annual Meeting. As this is our 34th meeting, Bob has now been president as long as the founder, Bill Marx. CIBO is dedicated to assuring that non-utility energy producers can continue to provide safe, cost effective, and reliable energy to sustain a strong and globally competitive economy. CIBO has pointed out the link between energy and environmental regulations and the economy and jobs. This has raised our credibility on a national and international basis.

CIBO is the only association in which owners, suppliers, and others come together to provide reasonable approaches to resolving energy and environmental issues in the US. Our inputs are consensus based across the membership.

None of this can be accomplished without the tremendous support of our staff (Gail, Candy, and Tiffany). Bob Corbin, working with Candy, has been a pillar of strength for membership. Lisa Jaeger, through Bracewell and Giuliani, provides us with top notch legal support. Karen Neale continues to provide outstanding service is setting up our Hill visits. CIBO has had a good year. We look forward to next year being even better.

Scott Darling, Alcoa, Inc. gave the results of the nominating committee for Board of Directors membership. Ann McIver, Chris Keuleman, and Mark Calmes were nominated to continue to serve on the Board. They were elected by unanimous voice vote.

III. Industrial Energy - The New Endangered Species

Duane Nelson of GWF Power reported on the early shutdown of the GWF coke fired plants in California.

In the early 1980s, GWF was spun off from Allied Signal with focus on employing technology to cleanly burn difficult fuels in California. The company has 130 Mw of petcoke plants, 250 Mw of gas fired plants, and 125 Mw of solar. The first coke plant was started up in 1989 with the last of 6 plants going on line in 1991. All of the plants have operated on 100% coke for the past 20 plus years. Fluid bed combustors were used to burn the coke with limestone for SO₂ control and ammonia injection for NO_x control. Overall capacity factors were over 95%, with summer peak over 99%. Environmental performances was excellent, exceeding California requirements. The ash was 100% recycled to the cement industry.

Then California passed some regulations on climate change that included the goal to achieve 1990 levels by 2020, 1100 lb/Mwhr of CO₂, and a cap and trade system for CO₂. These rules effectively eliminate the use of coal and coke in the state. In addition, 33% of all California Electricity produced must be generated by renewable energy by 2020. This would mean some 40,000 Mw of new renewable capacity by 2020. Large hydro does not count as renewable. Most of this capacity is wind and solar PV, with some solar thermal. This would mean that during the day time, a lot of generation would have to be renewable, implying that fossil plants would have to turn down (or shut off during the day). Thus, a coke plant would have to be extremely flexible in operation, still meet all of the environmental regulations, be very efficient and low cost, and still compete with natural gas.

Truck traffic and waste disposal counts in the environmental footprint. Of further significance, was that 5 of the sites were relatively close together in the San Francisco area. The local impact was significant. It was decided to shut down the coke plants. The generation will be replaced by natural gas. The coke that was being consumed will likely be shipped to Asia. Relative to the rest of the country, a lot depends on the future of natural gas. Issues include fracking, gas exports, gas demand, nuclear, environmental costs, permitting, the potential success (or lack) of CCS, and the cost of renewables.

Margot Thorning of the American Council for Capital Formation (ACCF) reported on Energy for the US Industrial Sector.

Projections for energy use in the US indicate somewhat faster growth in the industrial sector than the rest of the US. Most of the growth in demand will be supplied by renewables at the expense of petroleum. Others will mostly maintain their share of use with gas gaining slightly and coal reducing slightly (on the order of 1% difference in share values). Natural gas price projections are now lower than they were, but still expected to increase in the future.

The cost of regulations on the manufacturing sector has been steadily increasing at a faster rate than GDP growth or manufacturing output. The largest contributor to that cost has been EPA regulations. Regulatory cost to GDP in 2011 has been estimated at \$500 billion. The average decrease in physical output for various industries ranges from 5 - 10%, with the extreme being petroleum products at 13%. Estimates of the impact of the proposed EPA GHG regulations for 2014 range from \$25 - 75 billion in capital investment. Job losses would range from 500,000 - 1,500,000 jobs (20% of which would be in manufacturing). GDP losses range from \$50 billion to \$150 billion.

There are also impacts on the cost of electricity. In the states with renewable energy policies (RPS), the residential price for electricity is 30% higher than in states without an RPS. On the industrial price level, the increase is more like 20%. There has also been a push for “clean energy standards”. In the case of Senator Bingaman’s Senate “Clean Energy” bill, a number of scenarios were analyzed. In every case, projected GDP was reduced. Tax reform represents another potential problem for industry. Capital intensive firms may face higher capital costs for new investments. The cost of energy is likely to rise as energy producers and consumers face higher tax burdens.

Prospects for energy supply may be good if access to shale gas, off shore, tight oil, etc is allowed. Policy should allow markets to determine which forms of energy are used. Cost/benefit analysis should be used to evaluate new and existing regulations. The implications of tax reform on manufacturing and the economy should be considered.

Bob Wayland of US EPA reported on the Environmental Regulatory Landscape for Air.

While this report was on air, there are water and solid waste regulations that will impact industry. EPA has realized that many industries are facing multiple of regulations, some of which are conflicting. They have adopted a Sector Approach with more uniform standards. They are also adding oil and gas standards. Environmental Justice considerations are now a requirement in rule making. There are also risk and technology review regulations as well as greenhouse gas (GHG) regulations. The NESHAP portion of the Clean Air Act requires regulation of all 187 listed hazardous air pollutants. Once a standard is issued, it must be reviewed every 8 years. The New Source Performance Standards (NSPS) are also to be reviewed every 8 years.

In their new approach, EPA wants to group activities that under common control. The idea would be to have one set of standards inside the fence line. Likewise, consistent emission source standards need to be developed for use across sectors and source categories. In some cases, uniform standards are being proposed. EPA issued final rules in April for natural gas wells (green completion rules) that would allow and encourage fracking while providing appropriate protection for ground water and air emissions. Industry has been adopting these rules. It has been estimated that \$10 - 20 million savings have been realized in operations as a result of these rules (one of the first times this has happened). While this level of savings is small compared to the multi billions of dollars in cost of the other regulations, it is a step in the right direction.

With regard to Environmental Justice, the current effort has focused on identifying the areas near facilities with disproportionately high representation of vulnerable groups. Risk and Technical Review (RTR) rules were issued for 4 types of plants. The refinery sector rules are moving forward. Other RTR rules have been delayed. On March 27, 2012, EPA issued a proposed new source performance standard for CO₂ emissions for new power plants, which was published on April 13, 2012. There was a comment period that ended on June 25, 2012. Over 2.4 million comments were received and more are still coming in (in spite of the deadline).

The final rules for MATS were published on Feb. 16, 2012. Work practice standards for dioxin/furans and start up, shut down, and malfunction (SSM) were utilized. There have been 24 petitions for review. EPA has agreed to a reconsideration which will hopefully be finalized by March 2013. There are also reconsiderations for CISWI, Portland Cement, and Reciprocating Internal Combustion Engines (RICE). The chemical manufacturing Area Source rule is also under consideration.

Aaron Walters of Recycled Energy Development reported on Energy Project Selection, Evaluation, and Funding.

They design, build, own, operate, and finance energy projects with industrial hosts. The goal is to profitably reduce greenhouse gas emissions. The profitability must include the industrial host, the company, and the GHG reductions. The Industrial Boiler MACT complicates the issues due to the uncertainties surrounding what the rules will be and when they will be required.

Industrial competitiveness is international in scope, making capital cost requests difficult, especially if only cost is involved (as in compliance costs). The key is to follow the process for resolving tough problems (define the issue, gather the relevant facts, brainstorm solutions, process and analyze each solution, evaluate each solution, and present the data and make recommendations).

Using combined heat and power (CHP) as an example. With CHP, it is important to take a position on what future power prices (and energy prices) will be. The electric grid is becoming increasing gas marginal. The advantage for CHP is to gain two sources of revenue (heat and power) from one fuel source. If power can be sold at a reasonable price (competitive or slightly less), the cost of steam can be reduced.

The example of CHP will show a marginal cost of steam that is lower than for burning coal directly. Of course, cost of capital has to be included as well as O&M costs and risks. The issue is complex. It is important to present the results in the language that the key decision makers understand.

IV. Natural Gas Today and the Future - Panel

Bob Ineson of IHS-CERA reported on the rapid increase in shale gas production in recent years.

Shale gas has been around for many years, but it was difficult to produce. The combination of horizontal drilling technology and increased fracturing technology has been able to free up the gas that is held in the shale deposits. The increase in production has been 30% in 5 years from a very substantial base. Shale gas is now producing nearly 40% of US gas. The estimate of US reserves and resources has increased to 2,800 TCF, or more than 100 years at current consumption rates. Further, more is being discovered.

This forecast is considerably different from just a few years ago when we thought we would be running out. This technology will also impact oil production. In the short run, there has been an over supply of gas, which has caused a significant reduction in the price of gas. The marginal cost of gas is around \$4/MMBTU.

In order to substitute for gas, the price of gas has to be lower. This is the current state. As a result, more uses for gas are being proposed. This includes gas as a feedstock for chemicals, LNG for export, and major truck fleets. There is one permit approved in the US, as well as others going forward in Canada. By the end of the decade, additional demand should be able to exceed the current supply level.

Drilling for gas has dropped, which will cause a price correction. Production reductions will follow. Oil drilling is on the increase. US production is increasing faster than anywhere else. Tight supplies (capacity utilization) magnify changes in demand. Under tight supplies, pricing includes supply and capacity. There is a likelihood of a price spike in the next few years. This will be due to the lags in having production follow price signals. This is the natural volatility of the markets. While projections nearly always show 20 years of slow, but steady gas pricing, in reality, this has never happened. The real price will vary considerably around the average.

Ann McIver of Citizens Thermal reported on LDCs in the Middle.

Citizens Energy includes Citizens Thermal and Citizens Gas. Steam and electricity are competitors to natural gas for consumers. They have 7 BCF of natural gas storage as well as an LNG facility for storage. They are investigating the use of gas in transportation. The distribution company is responsible for delivery of natural gas to the customers. Customers include residential (about half), commercial, industrial, and electric generation. As a municipal entity, rates are determined by the Indiana Utility Regulatory Commission. Rate making is based on a statute based on cash revenue requirements. Rates must be sufficient to cover operating costs plus cash to service debt. As a municipal entity, there is no requirement to make a rate of return on investment. However, rates must provide enough cash to maintain a sound and reliable service. Rates that are too low are considered to be unlawful. Rates include O&M cost, extension and replacement, and commodity cost. Expenses are audited. Advertising is not a recoverable cost. Commodity cost is a pass through.

Weather drives the demand for gas. In a cold winter, gas demand for heat goes up. In a hot summer, gas demand for electric generation goes up. Energy efficiency and conservation have reduced the volume of natural gas sold. Decoupled rates allow the utility to recover costs independent of volume. With stabilized rates, the need for rate cases is reduced. The rate cases are open to intervention by stakeholders. The US Dept. of Transportation has regulations for pipeline safety, operation control, and standard procedures associated with maintenance of infrastructure. EPA covers all of the environmental regulations. The GHG rules have requirements under subpart W for fugitive emissions in infrastructure.

Dennis Finn of Wartsila North America, Inc. gave a manufacturers view of the future of natural gas.

Wartsila North America, Inc. makes large, reciprocating engines for stationary power plants and ships, as well as on O&M group for both. Globally, these engines amount to about 47,000 Mw/yr. These machines in the US are in the range of 9 - 18 Mwe, with heat rates of 8500 and 8100 BTU/kwhr on an HHV basis. The engines use no process water and do not need a high gas supply pressure (85 psi). These machines provide superior grid services for spinning reserve, black start, back up, load following, grid stabilization, etc. The 9 Mw machine can go from zero to full load in 5 minutes. The machine can then operate as needed, but shut down in 1 minute and start back up again. Plant sizes are increasing with larger size machines and multiple units. Units need to cycle without penalty, start quickly, and ramp up and down.

With regard to shale gas, there are lots of heavy constituents that have to be considered. If the heavier gas is sold directly, the heating value of the gas will increase which will impact engine operations including gas turbine engines. In the oil fields, there is often associated gas, some of which is flared. This gas also has a lot of heavier components. In such cases, diesel engines can make use of this material as fuel.

V. Electricity Today and the Future - Panel

Stu Dalton of EPRI provided a power industry view of fuel and power options.

In the power industry, there is a major shift in generation from coal to natural gas being spurred by low priced gas and regulatory considerations. Regulations tend to trump finances. Finances trump technology. Markets and finance will have to raise an estimated \$1.5 trillion to upgrade the power sector in the future. Technology that is less expensive and more flexible will be treated more favorably. Gas impacts both renewables and nuclear in the US. With lower capital cost and now lower variable cost, gas will make renewable build out more difficult.

Current policy is not pushing CO₂ capture and storage. The proposed GHG NSPS should be met by a new gas turbine combined cycle (although maybe not at all conditions). The current EU ETS price is less than \$10/ton CO₂. For coal, 40 - 50% reduction in CO₂ will be required to meet the standard, which only adds to the cost. The Kemper County unit (an IGCC under

construction) is the only plant that can comply. Even so, grants, subsidies, tax credits, and sales of CO2 for EOR were all needed to finance the plant.

There is no “silver bullet”. Gas prices are volatile. Wind and solar have grid problems. Nuclear power is under pressure. Existing coal is under pressure. Load growth has been flat. EPRI publishes the cost of generation from several technologies. Cost assumptions include 80% capacity factor for base load plants, no tax credits, and no CO2 price in the US. Offshore wind capital costs are \$3200 - \$4500/Kw. Concentrating solar and \$4500 - \$6000/Kw. Solar PV capital cost are \$3725 - \$5500/Kw. Combined cycle plants are \$1150 - \$1325/Kw.

New gas plants are very competitive, especially where coal costs are high (over \$2/MMBTU). Right now, we have great prices for natural gas, but future prices may be different. On coal, we will probably lose 10% of the existing fleet. Wind power has some issues, including inverse correlation with load. Solar cost is coming down but still high. Nuclear still has issues, but folks are looking at the two plants going ahead in the US.

John Anderson of ELCON gave his views on electricity.

Traditionally, electricity was more of regional issue than a partisan issue. Since the middle of the last decade, there have been wide political swings. The House and Senate are on different tracks. Little is getting done and little will get done under these conditions. There may be some tax credits for renewables, but energy is not a top priority. Transmission will become more important as renewables grow.

FERC has seemed to move toward “public policy requirements”. This could lead to socialization of costs. The EAct of 2005 allowed FERC to grant incentives for transmission constructions. Several commissioners are now questioning this approach. The fight over demand response continues. Decoupling is intended to break the link between the amount of energy a utility sells and the amount of profit a utility makes. There are issues on both sides.

Cyber security is a major concern. Whatever is done will be expensive. The question will be whether or not the expense will truly improve security. Gas and electricity are now inter-related. Issues of reliability, deliverability, cost are in the forefront. NERC is developing reliability standards, but costs are likely to increase. The FERC has made NERC standards mandatory.

The risk to industrials is behind the meter control at facilities (any utility like behavior). NERC scope continues to creep. EPA rules continue to be costly. Beyond air emissions, EPA is considering fracturing regulations for “safety”. While the climate issue may be on hold, the tax issue is in high gear. “Tax reform” may be used as a means to introduce a carbon tax to raise revenues.

VI. Combined Heat and Power Applications - Panel

The panel consisted of **Jeff Duncan of Vanderwiel Engineers, Leslie Witherspoon of Solar Turbines, Kevin Slepicka of Rentech, and Paul Howland of California State.**

There are a number of challenges to the boiler owners today, including MACT, fuel switching, age, capacity, reliability, emissions, operating costs, asset location, and safety requirements. Options include boiler replacement, modifications, process changes, outsourcing, shutdown, or combined heat and power. Participants in the decision making should include senior management, facility management, EHS, finance, planning, plant O&M, and engineering. A product champion is needed. The drivers include fuel cost, emissions reductions, rising electric costs, budget reductions, flexibility of energy production, reliability, and risk mitigation.

Elements in the assessment include loads analysis, technology screening, ownership, funding, utility interconnection, environmental impacts, fuel supply, project delivery options, and O&M. Load data needs to be captured and checked. Meter data, utility bills, and usage for electric gas, and chilled water. All energy loads need to be addressed, as well as the timing for each. One of the potential advantages of CHP is that some of these loads can be shared. Cogen technology includes a boiler with a steam turbine, a combined cycle, engines with waste heat recovery, and fuel cells. Boiler options include stand alone boilers, unfired HRSGs, HRSGs with duct burners, HRSGs with supplemental air, and multi-pressure HRSGs, Considerations include space concerns, emissions controls, and performance optimization.

For gas firing, NO_x control may require anhydrous or aqueous ammonia or urea as an ammonia substitute. Funding is a significant issue. The owner needs to think about internal financing, project financing, lease financing, or incentives (investment tax credits, rebates, production credits, etc.). Asset monetization of existing assets can help provide funds. A project proforma should be developed and sensitivities should be tested. An evaluation should be made of the “business as usual” utility tariff and cost. There may be a potential for excess power sales. There may be a rate tariff for standby power. There may be available incentives. Backup power, load shedding, standby conditions need to be evaluated. In some cases, it may be desirable to go off grid.

Permitting issues, while not as onerous as coal, are still significant. Non attainment areas require more stringent permits. For the smaller gas turbines, 25 ppm NO_x on natural gas is the NSPS. BACT is 15 - 20 ppm. LAER is in the 2 .0 - 2.5 ppm (SCR required). State and local regulations are similar, except for CT (controls on everything). At small sizes, the cost of SCR tends to be quite high on a \$/ton NO_x basis. In most cases, the high cost per ton can be used to avoid SCR on a “top down” BACT basis (which must consider cost). The tailoring rule causes a lot more projects to fall under PSD as a major source. Prior to the tailoring rule, a 110 Mw unit would trigger PSD for NO_x. Now a 20 Mw plant will trigger PSD for CO₂. That causes a lot of federal PSD permits. Since most of these units were going to burn gas anyway, there is no environmental benefit to the rule (at least for the smaller gas fired units). Netting can come into play if an oil or solid fuel fired unit is being replaced. Dispersion modeling is getting more difficult. The NO₂/NO_x ratio becomes important for the modeling. There are NSPS and MACT

requirements. While there are some considerations and orders to try to provide incentives for CHP, the regulatory issues tend to thwart CHP.

In California, the smaller users such as hospitals and universities are considering to shut down due to the AB 32 rule which will impose a cap and trade requirement for CO₂ emissions, but will not give these units any allowances because they are not exposed to “international” competition. Never the less, combined heat and power will generate something like half the CO₂ foot print of generating steam and power with coal. If the local utility has a low carbon foot print (either high nuclear or high hydro), then burning the natural gas will actually increase the CO₂ emissions.

For gas supply, it is necessary to identify the supplier, the location, the volume, and the pressure of the gas. It is necessary to find unbiased advice on procurement options. Sometimes it is possible to pool the purchasing with others. Reliability, predictable fuel price, and cost are considerations.

The overall project starts with a feasibility study leading to a validation study. From there preliminary engineering and budget confirmation is required. Permitting and utility interconnection needs to start. Then engineering can move forward leading to the purchase of long lead equipment. Finally construction begins leading to commissioning and training. Comprehensive commissioning is part of all options. Similar experience for company and specific team members should be required for construction. References should be checked.

One of the comments was that some of the gases other than natural gas are not suitable for dry, low NO_x combustors. If they have to use diffusion flame technology, the NO_x will be high (300 - 400 ppm). A combination of water injection and SCR would be needed to meet most current regulations. This situation arises from “wet” gas production that has significant amounts of higher hydrocarbons.

VII. Permitting in California - Dr. Ted Guth, Consultant

Many permitting agencies and districts are reluctant to recognize the differences amongst the various solid fuels. BACT is a moving target. There is no such thing as a “quick turnaround” permit. During the time a permit is under consideration, BACT can change. Pretty much every kind of combustion device has a BACT level and a technology associated with it. It takes about one and a half years to get a permit. However, it is increasingly likely that the environmental groups will sue over the permit. Resolution of the law suit takes about 2 and a half years. Thus, it takes about 4 years before construction can start with local considerations include citing, fuel supply, water, endangered species, habitat, etc. Air emissions have to be modeled on the worst day, but assumed to persist for 70 years.

California has decided that 33% of its energy has to come from renewables, which includes wind, solar, biomass, geothermal, and hydro. Since it will be nearly impossible to build another dam, hydro is pretty much a non-starter. Even so, PG&E has abandoned a combined solar and

biomass plant due to permit issues. With regard to greenhouse gases, the California Air Resources Board considers biomass to be CO₂ neutral. The local EPA region does not.

Existing plants are now focused on cutting fuel costs. A significant variety of “alternative” fuels are being evaluated. The majority of California biomass fuels are the result of a diversion of a waste stream to a power plant. The waste producer’s cost of disposal must be compared to the price a plant is willing to pay. The Forest Service can hold up plants or transmission lines. The existing biomass power plants have been an effective solution to the disposal of various waste streams. These plants are now being targeted as solid fuel plants.

California is the only state that has a full set of greenhouse gas regulations. There is a trading system as well as an emission rate standard. Each plant will have to buy “credits” for their CO₂ emissions. A 50 Mw plant would need \$5 million/yr added cost to purchase these credits.

VIII. Government Affairs - Anthony Reed, ADM, CIBO Government Affairs Committee Chairman

Anthony Reed, ADM was joined by **Karen Neale of Hummingbird Strategies** and **Lisa Jaeger of Bracewell & Giuliani**. The past year was one of the busiest years ever for the Government Affairs Committee. A CIBO map has been established, which locates the major source boilers of the members by Congressional district. This makes it somewhat easier to organize meetings with Congressional staff.

On Boiler MACT, CIBO participated in coalitions and filed comments on various aspects of these rules. Ultimately, a bill was passed in the US House of Representatives (HR 2250) what would have modified the compliance dates and the reconsideration times for the rule. A companion bill was proposed in the Senate (S 1392) but not passed (although 10 democratic senators were cosponsors).. Revised rules were issued by EPA. These were commented upon as well. The final rules are not expected until after the election.

The RCRA coal ash issue is still in play. EPA could decide to declare coal ash as a hazardous waste. Legislation has been approved by the House of Representatives on several occasions. Legislation was introduced in the Senate. However, it was not attached to the Transportation bill and needs another bill to latch on to.

On the NAAQS, the 2008 proposed standard was under litigation. EPA was planning to propose a new rule. The White House caused the rule to be pulled back under the guise of the need to review the rule again in 2013. The PM rule is supposed to go final by the end of the year. This rule would have been delayed even further, but for a Court order deadline. CIBO participates in a coalition, most led by UARG, to provide input on this issue.

A Clean Energy Standard Bill was put out by retiring Senator Bingaman (S 2146). This bill was intended to promote power generation with resources that would reduce greenhouse gas emissions, including coal with CCS, nuclear, and natural gas. There were hearings on the bill, but the bill never came to a vote.

Energy efficiency was the subject of an Executive Order as well as some proposed legislation. Part of this legislation is intended to promote manufacturing jobs. Most of the directives that have been proposed involve more studies and reviews rather than actual energy activities.

On the election, the House is likely to remain in Republican control. The Senate is theoretically “in play”. However, there are a lot of “toss up” races, making it difficult for a change of control. For the presidential election, the electoral college will determine the winner. Again, the difficulty is that the Republicans must win most of the “toss up” states in order to win in the electoral college. The likelihood is that things will get tighter. Thus, there will not be major changes to the committees.

There will be a “lame duck” session. Issues include a tax deal, unemployment benefits, a farm bill, and energy efficiency. Rules that are still waiting to go final include PM2.5 NAAQS, Cement MACT, Boiler MACT, GHG NSPS, Coal Ash, Waters of the US Jurisdiction, RCRA Definition of Solid Waste. Additional regulations include GHG NSPS for existing coal units, GHG NSPS for refineries, Ozone NAAQS, Tier 3 Standards for Refiners and Automakers, and CSAPR replacement.

Should there be a change of administration, there could be some delay for review in the effective dates, but most of these rules will become final. Most of the rules are either court ordered or mandated by law. The chances are that there will be more gridlock. At least 7 moderate Senators have either announced retirement or lost in primaries. There was double that number being lost in the House. The re-districting exercise has created more polarized districts such that elected representatives are limited in what they can support.

Issues that are expected to come up in 2013 include energy efficiency, NAAQS, Clean Air, Macro Approaches to Regulation, and Enforcement (w/CBI and EJ). Water may become the next major issue. There is already a problem with the State of Florida over numerical limits for discharges. There is a federal jurisdiction guideline on water that will go final. The goal of this guidance is to set standards for non-point sources such as agricultural run-off. Permitting will get more complicated, including point sources and water intakes. Numeric standards for EPA total maximum discharge loading (TMDL) are being proposed. River water basin commissions are also setting up jurisdictions for allowable water withdrawal levels for rivers and streams that feed the rivers. Climate issues include a potential carbon tax (a bill has been introduced), “no regrets” strategies, and state plans. Adaptation as a strategy to deal with climate issues is gaining more traction.

The Government Affairs Committee is seeking input from the members on the priorities and policies for these issues in 2013.

IX. Environmental Regulation Update - Bob Wayland, US EPA

Recent EPA actions impacting boilers include Industrial Boiler MACT, Area MACT, and the Incinerator MACT (CISWI). The Area Source rule was not stayed and is in effect. The Boiler MACT and CISWI rules were originally stayed, but the Court vacated the stay. Revised rules have been sent to OMB, but no decisions have been made. The Boiler MACT source category covers 14,100 boilers at major sources, of which 80% are gas fired and 4% are coal fired. Natural gas fired boilers have work practice standards at the present time. The environmental groups are not particularly satisfied with that approach.

There are 15 sub categories under the Boiler MACT rule. There are existing sources and new sources. The break point between large and small boilers is 10 MMBTU/hr. The energy assessment requirement will remain in the rule. Oxygen monitoring for units subject to a CO limit are currently required. That may change in the revised rule. PM CEMS will be required for units greater than 250 MMBTU/hr. Tune ups, energy assessments, and output based limits are being promoted as a means of minimizing the production of pollutants.

Petition issues include subcategories, monitoring, emissions limits, MACT floor methodology, exemptions, tune up provisions, output based standards, fuel sampling, health based limits, surrogates, and compliance. There will be some references to the MATS rule. The start up and shut down requirements will likely look like the MATS rule. This would allow a “clean fuel” on start up and shut down. That usage allows the use of a work practice standard.

In the Area Source rule, there are 3 sub categories (coal, biomass or oil, and gas). Most of these small units will end up with work practice standards. Petition issues included compliance dates, seasonal boilers, temporary boilers, monitoring, energy assessments, and surrogates.

There will be an opportunity to comment to OMB on these rules. There are guidance documents on the EPA web site. Industrial Boiler MACT is under Jim Eddinger. The Area Source Rule is under Mary Johnson. The CISWI rule is under Tony Johnson. The Secondary Materials rule is under George Faison. For implementation and application, Sara Ayres is the contact.

X. Energy/Environment Discussion - Jay Hofmann, Trinity Consultants, Inc.

There will be two panels for this discussion. The first panel consisted of **Rob Kaufmann of Koch Companies, Vince Albanese of Fuel Tech, and Bill Campbell of AECOM**. This panel will discuss environmental impacts. The second panel on energy consisted of **Fred Cleveland of Eastman Chemical, Mike King of Black and Veatch, and Greg Leibel of B&W**. **Rob Kaufmann** pointed out that getting a permit is exceptionally difficult. For PSD permits, the NAAQS are getting tighter, the modeling compliance issue more difficult, GHGs can now trigger PSD, and Environmental Justice must now be considered. For ozone, the current rule is at 75 ppb. EPA proposed 65 ppb, but this was revised to 70 ppb. The proposal was pulled. A recent report by CASAC has suggested that the next review should consider 55 - 60 ppb. The particulate NAAQS is proposed at 12 micro grams/m³. More monitors are being proposed near roads. As a result, more non-attainment areas will result. For non attainment areas, offsets are

pretty much a necessity but are harder to come by. For attainment areas, compliance must be modeled. GHG regulations now trigger PSD permitting.

BACT analyses are painful despite the lack of proven CCS availability. There is a deferral for biomass, but that is running out in the next year. The addition of EJ considerations will only add more time to the permitting process. There could also be scope and equipment additions. This opens the way for issues that are not necessarily environmentally related. In order to minimize permitting problems, try to avoid PSD/NSR, line up offsets if possible, initiate modeling early, use EPA BACT guidance, and be proactive on the local benefits.

Vince Albanese noted that EPA was quite restricted by the Clean Air Act in their approach to the MACT rules. For existing sources, the average of the best 12% implies that some “technology” is available to meet this requirement. Thus, for those units that need to add controls, the goal is to meet the rules at the lowest cost.

One approach is to examine opportunities to combine controls (ie capture two components in one device). Another approach is to combine technologies directed at the same compound (ie low NOx burners with SCR or SNCR). These techniques mean a lot of process optimization. Balance of plant considerations become more important as emission limits become more stringent. This will necessitate increased communications with suppliers in order to carry out these types of studies.

Whenever multiple devices are used, the output of one will be the input to the other. Close coordination will be required. Greenhouse gases are a bigger problem. The Tailoring Rule is set to lower the threshold for triggering PSD. There are a number of law suits underway on several aspects of the proposed rules.

Bill Campbell pointed out that there have always been challenges in getting permits. There are just more of them now.

A team of specialists is really needed to obtain a permit today. The team should consist of the owners engineer, an environmental expert, an environmental lawyer, and the vendor engineer. Challenges should be identified early and prepared for early. Cutting corners is not a good idea. The goals, objectives, and purpose of the project need to be clearly thought out and written down. It is also important to recognize which regulations apply to the project. There are few new coal fired projects in the US today.

There are many projects in converting to gas. For facility modifications, more times than not, the new source does not cause a problem in the modeling. It is the existing equipment that may cause modeling problems. Projects should attempt to stay in attainment areas if possible. If not, offset availability should be investigated. PSD permitting should be avoided. This is difficult for GHGs and PM2.5. PSD permitting requires NAAQS compliance determination. With the tighter NAAQS standards, it is necessary to model as early as possible.

Modeling issues include dispersion issues, reduced emissions, and enhanced modeling techniques to reduce conservatism. Site monitoring is a potential alternative, but the risk is that

the real data shows non-compliance. Advanced modeling techniques require the in stack relationship of NO/NO₂. The modeling techniques are being advanced to cover calm days, dispersion, distance, and variability. For example, an emergency generator doesn't run for long periods. Using the worst day, worst hour approach out to long distances for a 1 hour standard doesn't give rational results. A Monte Carlo approach is being proposed for this type of analysis.

Fred Cleveland reported on the impacts on investment decisions. Most people don't understand how companies make investment decisions. Capital expenditures are only a portion of the allocation of a companies profits. Growth opportunities are the primary drivers of company investments. Growth opportunities are less available in North America (or Europe). Growth areas are in other parts of the world. The question becomes, "Why invest in the US?"

One of the key issues is the cost of energy. The availability of low cost, natural gas provides one cost advantage for the US. The debt markets right now are offering low rates for investment grade companies. Risks have to be evaluated to get a risk weighted cost of capital. The regulatory, policy, and tax issues in the US contribute to a much higher risk adjusted cost of capital.

Companies want a level playing field, predictable/rational regulations, and an opportunity to make use of our natural competitive advantages. Technology tells us what is possible. Economics tells us what is practical. Politics tells us what we are allowed to do.

Greg Leibel noted that gas prices are at a low ebb right now and that is driving a lot of interest in converting coal units to natural gas. There are a number of approaches including a complete retrofit, a burner retrofit, or a partial burner retrofit. The complete conversion is more expensive, but will give a more efficient performance. Superheater performance will be impacted. Gas weights will change. Fans need to be checked. Spray attemperators need to be checked. Units can be modified such that only part of the burners use gas. This results in a co-fired unit. The advantage would be that the opportunity to use coal in the unit is preserved. Ultimately, the coal unit could be shut down and a new gas plant installed. For solid fueled units, there are a number of back end control technologies. They all impact one another. There is no one optimal solution. Each plant is site specific.

Mike King pointed out that some 30,000 Mw of existing coal fired units have been announced as candidates for shutdown. There are reliability and grid stability issues involved in these shut downs. Nearly \$150 billion is repair, replacement, and equipment upgrades involved in the shut down of these units. The added demand for certain materials could drive costs up for these materials for industrials.

Submitted by Carl Bozzuto

