



Billings Refinery

November 2, 2015

Dear Council Member:

Please find attached a copy of the minutes from our October 13, 2015 CAC meeting. Just a reminder that the next CAC meeting will be **TUESDAY, NOVEMBER 10, 2015** at the Phillips 66 Learning Center. The meeting will run from 5:30 to 7:30 p.m. Dinner will be served from 5:00 to 5:30 p.m.

Sincerely,

Ann L. Clancy, Ph.D.
Meeting Facilitator

**Meeting Location: Phillips 66 Learning Center
415 South 24th Street**

**PHILLIPS 66 BILLINGS REFINERY
CITIZENS ADVISORY COUNCIL
October 13, 2015**

MEETING MINUTES

Present: Council members: Keith Beartusk, Bob Carr, Travis Harris, Bob Hoar, Shirley McDermott, Eileen Morris, Gregory Neill, Katey Plymesser, Emily Shaffer, Andrew Sullivan, Michelle Zahn, Stella Ziegler
Phillips 66 management: Colin Franks, Mark Kohn
Facilitator: Ann Clancy

Absent: Lucas Blehm, Paul Dextras, Ralph Hanser, Mark Hilbert, Lance Johnson, Bruce MacIntyre, Melissa Patton, John Pulasky, Ray Rigdon, Jim Ronquillo, Melanie Schwarz, Mike Yakawich

Guests: College of Technology students

AGENDA

- Welcome/Introductions
- Panel Discussion: Cost of Energy
- Refinery Update
- Next CAC Meeting: November 10

WELCOME/INTRODUCTIONS

Colin Franks opened the CAC meeting and apologized that he and Ray Rigdon would not be able to attend because of a visit from Houston corporate executives. He introduced Mark Kohn, Environmental Director, who would act in their stead. He also introduced Dave Whisenhunt, Supervisor of Coordination & Economics at the Billings Refinery, who participated on the subteam that developed the panel discussion on Cost of Energy. Other subteam members were Shirley McDermott, John Pulasky, and Keith Beartusk.

Bob Hoar, Provost and Vice Chancellor for MSU-B was welcomed as a new CAC member replacing Mark Pagano. The following COT Power Plant Process Technology students attended the meeting: Michael Baker, Brenton Buerkley, Shelby Eckart, Hunter Maddox, Austin Pickering, Joshua Tompkins, and Dayton Willoughby.

PANEL DISCUSSION: COST OF ENERGY

The theme of the panel was the *Cost of Energy*: a discussion of the impact of dropping oil prices in a number of areas. There were four panel members scheduled but one was unable to attend at the last minute. Keith Beartusk played the role of panel moderator. Each of the three speakers made a short presentation followed by questions/comments from CAC members.

- Effects on drilling in the Powder River Basin (Dave Ballard, President, Ballard Petroleum)
- Bakken report (Alan Olson, Field Representative, Sanjel USA)
- Opportunities for transition (Randy Hafer, President, High Plains Architects)

How Low Can We Go: Drilling Economics in the Powder River and Williston Basins

Dave Ballard, President, Ballard Petroleum Holdings, began his presentation with a profile of his company. Ballard Petroleum Holdings LLC has been a privately held, independent oil and gas producer since 1992. There are 80+ members in the partnership structure which focuses on leasehold and production in Wyoming and North Dakota. There are seven members of the management team and a staff of 31 at the headquarters in Billings and another 19 in the Gillette, Wyoming production office. The company does 90% of its business in the Powder River Basin in Campbell County in Wyoming.

Dave explained that the drilling in Wyoming is for sandstone as opposed to shale in the Bakken. His company is now able to access and develop “trash” rock which are rocks with 20% porous space that are accessed through horizontal drilling and fracking. There is some shale in Powder River Basin but it is not mature enough yet so it is not economically feasible to mine. The annual net production of the company from 1992 to 2014 shows substantial growth from less than 100,000 BOE (barrels of oil equivalent per day) in 1992 to 1,500,000 BOE in 2014. According to Dave, the development of refined horizontal drilling technology has led to great increases in sweet crude oil production, especially since 2010. He shared a slide tracking oil price history beginning in January 2008 at \$60/barrel, falling in 2009 to \$20 barrel, then a steady climb up to \$90 barrel in January 2014 followed by a precipitous drop in oil prices to \$40 barrel in January 2015. Low oil prices are projected for the near future – dubbed by analysts as a “lower for longer” trend.

Dave presented some data on the recent volatility of oil prices which has resulted in US drillers continuing to idle their rigs for the sixth week as of October 15, 2015. Oil production in Montana, North Dakota and Wyoming has followed the overall US oil production trend but at many fewer barrels per day (below 10,000). Dave pointed out that US companies have to be able to keep drilling in order to keep production up. Rig counts in Williston Basin have dropped 34% since 2013 and 31% in Powder River Basin. Dave expressed concern that as rig numbers drop so will production.

According to Dave, Ballard Petroleum is focusing on the following items during the “lower for longer” oil trend: making cost reductions, drilling within discretionary cash flow so as to encourage debt reduction, drilling in economic sweet spot areas, optimizing well performance through fracking techniques, and re-evaluating economics and budgets weekly. Dave noted that all companies are lowering their well costs to adjust to breakeven oil prices but acknowledged that despite efficiency improvements most US companies can't function profitably at \$45 per barrel. He pointed out that oil companies are now being scrutinized by the bankers. He shared an example of cost savings in his company, explaining that a \$9 million investment over a three-year period needs to yield a \$10.4 million payout to be worthwhile. He gave the example at the international level of ConocoPhillips being able to go to 2017 with cash flow neutrality without worrying since “\$8 billion is the new \$9 billion” in terms of capital to maintain flat production.

Bakken Update Report

Alan Olson, Field Representative with Sanjel USA, described his company as a subsidiary of Sanjel, a specialized, privately owned Canadian global energy service company with over 33 years of experience. Sanjel was founded in 1982 with headquarters in Calgary. Sanjel employs approximately 3,300 people and has nine office locations operating in five countries. Sanjel provides two specialized product offerings: pressure pumping and completions. It has become

an important provider of hydraulic fracturing services as the North American energy industry has tapped increasing volumes of oil and gas trapped in shale formations.

He shared a graph tracing the history of oil prices (inflation adjusted) from 1947 through 2015 showing a spike in 1979 to \$110 per barrel then a drop in 1987 to below \$40 barrel followed by a low in 1998 of under \$20 to another spike in 2007 up to \$100 barrel. Two dips have occurred since in 2009 and 2015. He noted that West Texas Intermediate price had a one-year 43% decline from October 2014 to September 2015. Alan stated that Standard & Poor's TSX energy sub-index has lost about \$85 billion in value this year as the price of West Texas intermediate crude touched its lowest point since 2009. Of the 63 members of the index, all but three have posted stock losses in the past year.

As a local comparison, Alan showed how in 2014 the posted price for Williston Basin Sweet was \$81.85 with other breakeven costs ranging from a low of \$29 (Dunn) to a high of \$87 (Burke & Golden Valley). In 2015, the posted price for Williston Basin Sweet has been \$30.26 and breakeven costs have ranged from \$24 (Dunn) to \$85 (BOT-REN, BOW-SLP). As of October 12, 2015, the oil markets were at:

North Dakota	
Williston Basin Mixed Sweet	\$41.62
North Dakota Light Sweet	\$40.75
Texas	
West Texas Intermediate	\$46/08
Wyoming	
Wyoming Sweet	\$41.74
North Wyoming/South MT Sweet	\$40.10
Eastern Wyoming Sweet	\$42.89

Alan noted that working rig numbers as of October 2014 totaled 2,211 in the US with 187 drilling rigs in North Dakota and 12 in Montana. In contrast, Alan said this week in 2015 there are only 905 drilling rigs working in the US with 65 in North Dakota and only one in Montana. Alan explained that drilling rigs are getting more efficient and that daily drilling costs are declining. For example, it is now possible to frack two wells at once by using pads and thereby eliminating truck traffic. Along with greater efficiencies, daily drilling costs have been reduced. In 2013, daily drilling costs were running at \$70-80,000 a day. Today those costs have been reduced to \$55-60,000 a day depending on what portion of the basin you are drilling in. According to Alan, well servicing has also seen its share of more efficient operations and significant cost reductions, primarily due to the extremely competitive market place and new designs in cement slurry design, fracturing fluids and completion fluids. Pad drilling has allowed the stimulation of multiple wells thereby decreasing mobilization costs and water management systems have removed a great number of trucks off the highways.

Alan stated that Sanjel has been doing well in terms of not having to lay off many field workers. About one-third of the corporate office personnel have been cut however. As well servicing costs have dropped, available crews have been impacted and they are made up of skilled operators who cannot be easily replaced. In 2013, there were 23 fracking companies with 64 fracking fleets in the Williston Basin. Today that has dropped to 10 companies with 19 fracking fleets.

He concluded by describing the "culture of safety" that now exists in his industry – a far cry from the earlier "rough and tumble" days of oil and gas drilling. He noted that oil field employees

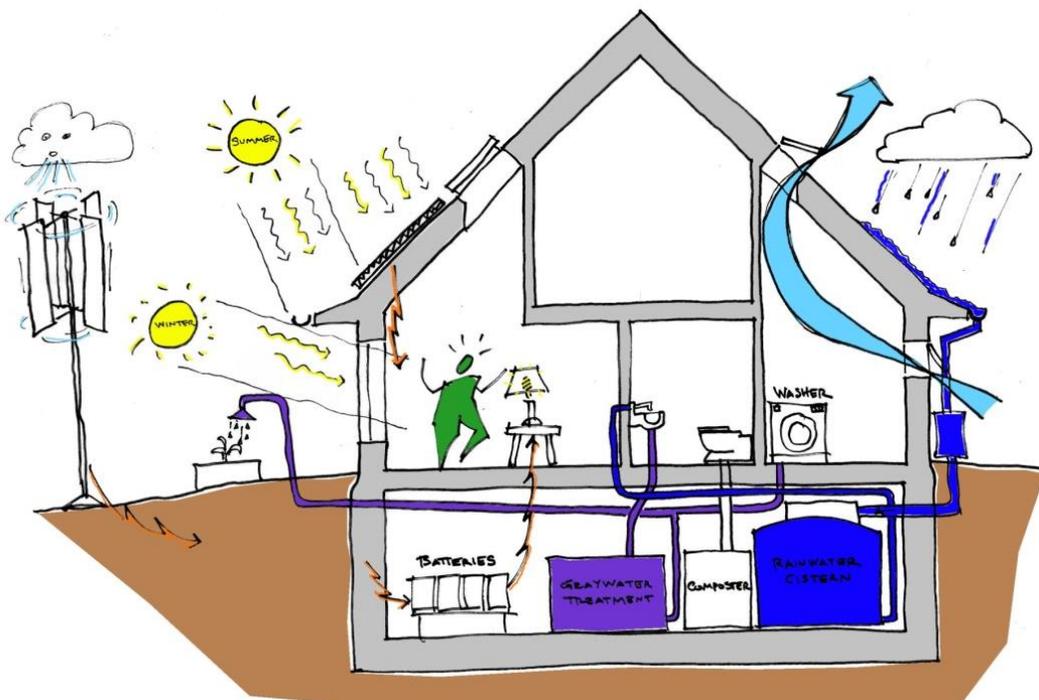
today have some of the best safety training of any occupation along with drug and alcohol testing. This safety culture also extends to field fleet maintenance.

Urban Frontier House: Opportunity for Transition

Randy Hafer, President of High Plains Architects, provided a real life example of how you can take advantage of opportunities that arise to live more economically and environmentally during times of energy crisis. He related the story of how 40 years ago he lived in California during the 1970's energy crisis and what a lasting impact that made on him. Today he is building an urban frontier house at the corner of 7th and 23rd Streets, one block from North Park, that will use no oil at all. He shared the sustainable design goals he developed for the house:

1. **Urban site:** small & urban
2. **Low budget:** similar to new conventional houses
3. **No offsite utilities:** "off the grid"
4. **Comfortable:** by modern standards
5. **Low maintenance :** durable & low maintenance
6. **Easy operation:** simple & easy to operate
7. **Replicable:** yes
8. **Scalable:** yes

Below is a drawing of the house showing how its orientation (location for sun-free energy), building shell (building & energy codes), and heating, cooling, water and energy systems work together to eliminate any need for sewer, gas, water or electricity grid resources. Instead of toilets run by water, he is using vented composting. There is storage capacity for 9000 gallons of water in the basement. He described the house as a "loop" working with cycles of energy. He is planting gardens but no grass on the lot.



The following questions and comments were recorded by CAC members addressed to all panel members:

- *What about the Urban Frontier House being overly insulated?* There is a heat recovery ventilator and an air exchange system constantly working at a low level.
- *Are there any prototypes for the Urban Frontier House in the world?* I think it's unique with all the elements we have including an innovative electrical system.
- *What's the square footage of the house?* It's 2400 square feet with three bedrooms and three bathrooms.
- *Have you had any trouble with permits in building the house, e.g., composting?* I've been working with the Director of Public Works and he has granted us some variances. There is a lot of interest in this as a prototype that could be replicated elsewhere in Billings.
- *Will this concept work on smaller houses?* Yes, we are working on a 76 unit apartment structure to use some of these design elements in a five-story building.
- *What happens with the wind and solar energy when it's cloudy or not windy?* We are working on calculating battery storage space to cover those periods and we're doing studies on power generation curves. We are anticipating a three-day gap with a battery back-up. The house will be continually internally monitored for indoor environmental quality by tracking all consumption and real time experiences.
- *What quality of oil do you drill for?* It's comparable to the Bakken oil.
- *What do you think of the removal of restrictions on exporting US oil?* We'll be cost competitive in the US if we can do that.
- *What about groundwater pollution from fracking? What is the opinion now?* It has never been an issue in Montana, North Dakota, Wyoming or Colorado. There have been no cases of contamination. Sanjel has to publish a frac fluid disclosure statement in Montana. There is now protection with cement surface casing and additional liners.
- *With the consolidation of companies and scale back of work, what about the skilled labor? If the industry scales back, doesn't it cause an excess of skilled workers?* There are a lot of transient workers who moved back to their homes and are getting comparable jobs. Sanjel is still hiring in certain areas and wages are keeping up but there is no overtime and no bonuses.
- *Do we want to export oil?* It would be helpful because it is more efficient worldwide. In this town there are refineries geared up for sour crude so if we can supply sweet crude to other areas of the world, like the North Sea which is a played-out area, we are contributing to the overall supply. We can use the sour crude in our refineries and export the sweet crude.
- *What's the breakeven amount for oil so that the economy thrives?* If prices are at \$50 a barrel it is making money but there are not as many rigs working. The \$50 is an easy measuring stick.
- *In the past when oil prices dropped, OPEC would reduce production so why isn't that happening now?* The world now recognizes the US as the swing producer. If oil prices can be kept reduced to less than \$70, the US has difficulty growing production. OPEC members want to retain the same percentage of their share of the world's oil supply. But they are also dropping prices and hurting. The Saudis call the shots and their breakeven is \$20 barrel.
- *How long does it take to frack a well?* What used to take 5 to 6 days we are now doing in 3 to 4 days.
- *When do you restore the land after fracking?* Not until the well is plugged.

REFINERY UPDATE

Community: Mark Kohn reported that the Meet in the Park event in September went very well and that refinery leadership is very pleased with this outreach effort to the community.

Operations: The Vacuum Improvement Project is being ramped up for 2016. It is an enormous project for Phillips 66 with a \$300 million investment. The intent is to extract more energy out of the raw materials that the refinery receives and at the same time eliminate waste by recapturing thermal energy. The project will require one of the refinery distillation towers to be replaced. There is one crude tower that is not as efficient any more so this will be updated. It's an exciting project and shows a real commitment to the Billings refinery. Two-thirds of the investment capital in the corporation will be with this project in Billings.

Safety: Jay Churchill, a former Billings refinery manager, is visiting from corporate and gave a presentation to about 60 employees on the importance of safety. The refinery has a good safety record. There were a couple of recordable injuries in the past months involving a worker who dropped something on his leg and broke it and another employee who cut himself using his knife. All non-official knives are now banned from the refinery.

NEXT MEETING: November 10

Location: Phillips 66 Learning Center

- Welcome/Introductions
- Refinery Update
 - 2017 Turnaround: Impact on Community & Update on Vacuum Improvement Project
 - Refinery Environmental Issues
 - Refinery Safety Issues
 - Introduction of Steve Torpey, Air Environmental
- Update on Planning for 25th CAC Celebration on December 8
- Debrief of Phillips 66 "Meet in the Park"
- Community, Refinery & Transportation Updates
- Next Meeting: December 8