

WTE Column of July 23, 2014. Editor's headline: Beware of oil recovery efforts

Decades ago, when the world touched Peak Oil and skipped past—the easy-to-recover “sweet” crude was all but used up—environmentalists hoped the US would lead the way in alternative sources so that we might wean ourselves off fossil fuels. A few years down the road, we find ourselves with institutions like the Enhanced Oil Recovery Institute (EORI), a University of Wyoming affiliate, where scientists seek to figure out how to access “unconventional” reservoirs that exist amid shale, tight sands, and tar sands. Further, inasmuch as aged, previously-closed oil wells extracted only a portion of what could potentially be recovered, industry efforts also hone in on retrieving these residues. EORI is one lab-to-field exercise among many that have sprung up with the encouragement and financial support of a state government. Federal endorsement comes via the Department of Energy.

Earlier this month, the institute held its annual conference—its eighth, in addition to yearly EOR workshops—in the Casper Events Center. The emphasis was on CO₂ injection to increase production in hopes of reducing water volume. The institute's motto, “Working to Recover Stranded Oil Reserves in Depleted Oil Reservoirs as Rapidly, Responsibly, and Economically as Possible,” should give us pause, for “as economically as possible” is IndustrySpeak for cutting corners, circumventing regulations, exploiting workers, and lobbying for subsidies. Needless to say, such maneuvers don't get to be conference topics.

Instead we heard about oil in the millions of barrels, to be squeezed from aging oil fields in Wyoming and elsewhere by employing “CO₂ flooding” of old wells or by shooting the carbon dioxide into the now ubiquitous horizontal ones. Economists calculated the jobs these extra millions of barrels will create. Consultants claimed that Wyoming and the Permian Basin represent “the two most mature markets for CO₂ in the world.” Others explained that the use of CO₂ in recovering previously-unreachable oil reserves constituted a sequestration of the greenhouse gas. Environmentalists, rejoice! The fossil-fuel industry has joined your ranks.

Still, if you listened closely, you heard amidst the hurrahs some cautionary tales. Glen Murrell of GE, formerly a research scientist with EORI of UW, acknowledged that, although CO₂ supplies have increased and are widely used in Wyoming, at the GE site, the new injection “has yet to translate into significant production increases.” Robin Watts of Linde, one of two women speakers out of twenty, warned of the environmental footprint and its adverse effects on the “total lifecycle costs of hydraulic fracturing fluids” when these fluids are “energized” with carbon dioxide or nitrogen. John Harju of EERC commented that, while CO₂ has been used successfully in conventional wells, the “tight oil” at Bakken is a horse of a different color, since Bakken relies on “a fracture network.” Nevertheless, because CO₂ can “mobilize significant amounts of oil from shale to reservoir rocks,” his company has undertaken a pilot project of laboratory and modeling work.

Even in conventional drilling, using CO₂ can be a problem, as Roy Cramer of Chevron discussed in the “vertical conformance” challenge at Rangely. Efforts to inject “the desired fluids into the targeted zones” proved unfeasible because the fluid migrated through old well bores even as equipment failed due to corrosion, and “plugging is very costly to fish out the wellbore.” Naturally, Cramer and other speakers stayed away from terms like “migrating” and “fugitive” emissions, couching their findings in word-salads like “certain isolated patterns have exhibited high CO₂ production and inefficient CO₂ utilization,” or cautioning against “the channeling of fluids through high permeability, low volume zones” and “the gravity over-ride of the injecting fluids.” (This, from two speakers commenting on the Salt Creek field in Natrona County on

behalf of DOW and Anadarko.) “Injectivity loss can occur over time,” said Mark Holtz of Baker Hughes. In other words, in these operations carbon dioxide escapes by the tonnage. Holtze’s solution: throw more chemicals at the intransigence: “These damages need specific chemical treatment to medicate (sic) the problem,” states his abstract.

Nevertheless, Mike Blincow of Denbury said that in addition to his company’s continued development on Bell Creek, “several fields in Wyoming” are on the books for CO₂ implementation. And the Institute’s own Peigui Yin touted the residual oil zones (ROZ) within the Tensleep Sandstone in the Bighorn Basin, which, he says, contains ROZ with saturations as high as 80 percent. Hence, the resources in Bighorn are “significant targets for EOR.”

The discussion of EPA regulations occurred in muted tones. Attorney Vicki Marquis explained the 2014 federal carbon pollution standards and alluded to pitfalls that will need to be addressed. Among other things, the regulations ignore CO₂ as a potential industrial resource, treating the gas as waste that needs to be disposed of.