Slow Train Coming

What's Ahead for Crude-By-Rail

- **Rapid development of crude-by-rail (CBR) infrastructure in the 2010-14 period provided critical support to fast-growing oil production regions.**
- **During the CBR build out, a total of 178 rail terminals were built or significantly expanded, with 99 loading terminals and 79 unloading terminals developed.**
- **The oil-price collapse and the construction of new pipelines have undermined CBR economics and reduced the crude volumes being moved by rail.**
- **The continued need for CBR varies widely due to many factors, including producer oil-delivery and refinery oil-supply alternatives-or lack thereof.**
- **The use of many rail loading/unloading terminals has fallen sharply, and may well drop more as producers' take-or-pay commitments expire. Utilization of U.S. facilities is only about 20% of nameplate capacity.**
- **CBR volumes remain high along some corridors, and use of CBR could rebound more broadly if crude prices and production rise, depending on the impact of major oil-price differentials that support CBR.**

1. Introduction

The rocketing rise in U.S. crude oil production as the Shale Revolution came to the oil patch in 2009-10 called for a radical rethinking of the nation's oil-delivery infrastructure. In several basins, especially the Bakken in North Dakota, volumes ramped up rapidly, far more than the few existing pipelines and local refinery demand could handle. Developing new pipeline capacity to deliver that oil to market at the lowest per-barrel cost would take planning, producer commitments, governmental and landowner approvals, and (perhaps most important) time. The problem was, there was no time. Oil prices at the major hubs were attractive but local prices were depressed due to transportation capacity constraints. The oil was ready to flow, and it needed to be delivered to refineries or storage—and pronto.

Enter crude-by-rail (CBR), the alternative, quicker-fix approach that involves loading crude onto railcars and--using the nation's existing, extensive rail networks-- delivering it either directly to refineries, or to facilities where oil could be unloaded into storage or onto barges. Moving crude by rail requires infrastructure: facilities in or near production areas to efficiently load oil onto tank cars, unloading facilities at the end of delivery routes, and the tank cars themselves (either purchased or leased). Importantly, loading and unloading facilities could be developed very quickly, typically within 12 to 24 months, or less than half the time it cost to bring most pipelines

online. Also, CBR facilities are inexpensive compared with pipelines, mostly costing only tens of million dollars, not hundreds of millions or even billions. That reduces the contractual/financial commitments that project developers need from oil producers to make their projects a "go".

The initial build-out of CBR infrastructure started slowly; most of the industry was skeptical, viewing the idea of moving crude by rail as an antiquated notion that—while useful in the oil industry of the early 20th century—no longer made sense. However, EOG Resources, a pioneer in CBR's resurgence, ignored this prevailing view and built the first loading facility for unit trains (trains composed solely of 100+ tank cars carrying crude) in the Bakken in Stanley, ND in 2009. The first unit train out of Stanley left the terminal the last day of that year, making a four-day trip to a new EOG unloading facility in Stroud, OK, where the oil was fed into a new, 17-mile pipeline to the crude oil hub in nearby Cushing, OK. EOG's success in moving increasing volumes of oil out of the Bakken—and the triumphs of other "early adopters" of CBR in both the U.S. and Canada—led to a flurry of terminal-building and tank car-ordering, which was followed by sharp increases in the volumes of crude that was moved by rail, especially in 2012 and 2013.

One question was asked often during this build-out period…"Is crude-by-rail a temporary fix that will be displaced when new pipeline capacity is built, or will the destination-flexibility that CBR provides make it a permanent fixture on the midstream landscape?" If the question were asked of a Magic 8-ball—that fortune-telling standard of baby-boomer youth—the answer might have been, "Reply hazy, try again" or "Ask again later."

CBR's future role became increasingly uncertain. The July 2013 rail disaster in eastern Quebec—in which an unattended train carrying crude rolled downhill and derailed in downtown Lac-Mégantic, killing 47 people—raised questions about CBR safety. That tragedy and a spate of other crude train mishaps resulted in heightened public concern and tightened rail line and tank car regulations. Next, pipelines planned to relieve delivery constrains out of the Bakken and other fast-growing shale plays started coming online, giving producers a generally lower-cost alternative for moving oil to market. Regional price differentials shrunk as a result, chipping away at the economic rationale for moving crude by rail.

Then came the crude oil price collapse in mid-2014. U.S. CBR volumes (excluding Canadian volumes) peaked in December of that year at about 930 Mb/d. Since then, CBR volumes have been on a steady decline, falling to 580 Mb/d in February 2016. Now, many of the tank cars ordered to meet the demand of CBR sit idle; take-or-pay contracts giving producers and others the right to use loading and unloading terminals are rolling off; and more pipeline capacity is being built.

For all these reasons, the near-term outlook for CBR remains hazy indeed, particularly if persistently low oil prices continue to hold down production volumes. But all is not gloom and doom. Volumes on some CBR shipping corridors are holding up and a few new terminals continue to be built. Also, the inherent advantages of CBR-- flexibility, optionality and speed-to-market--will always play a role in the continually evolving crude oil markets.

RBN Energy has been charting the CBR phenomenon from its infancy, blogging extensively about loading terminals being developed in the Williston/Bakken, the Niobrara, and other production areas, as well as the unloading terminals being built at refineries, marine terminals, river docks, and other delivery points. We have tracked the side-by-side growth of crude production and CBR capacity, which enabled the increasing volumes of crude produced in areas underserved by pipelines to be delivered to market. And we have provided regular updates on the new pipeline capacity being developed—capacity that, over time, gradually undermined the economics of CBR and more recently led to declines in CBR volumes.

In this Drill Down Report, we examine the fast-paced evolution of CBR from producers' godsend to crude-delivery mainstay, and from mainstay to too-costly alternative to pipelines. Importantly, we consider CBR on a local basis, because it is clear that the variables that affect CBR economics and volumes are as much local as they are national.

The Table of Contents for "Slow Train Coming: What's Ahead for Crude-By-Rail" is included on the following page.

Table of Contents