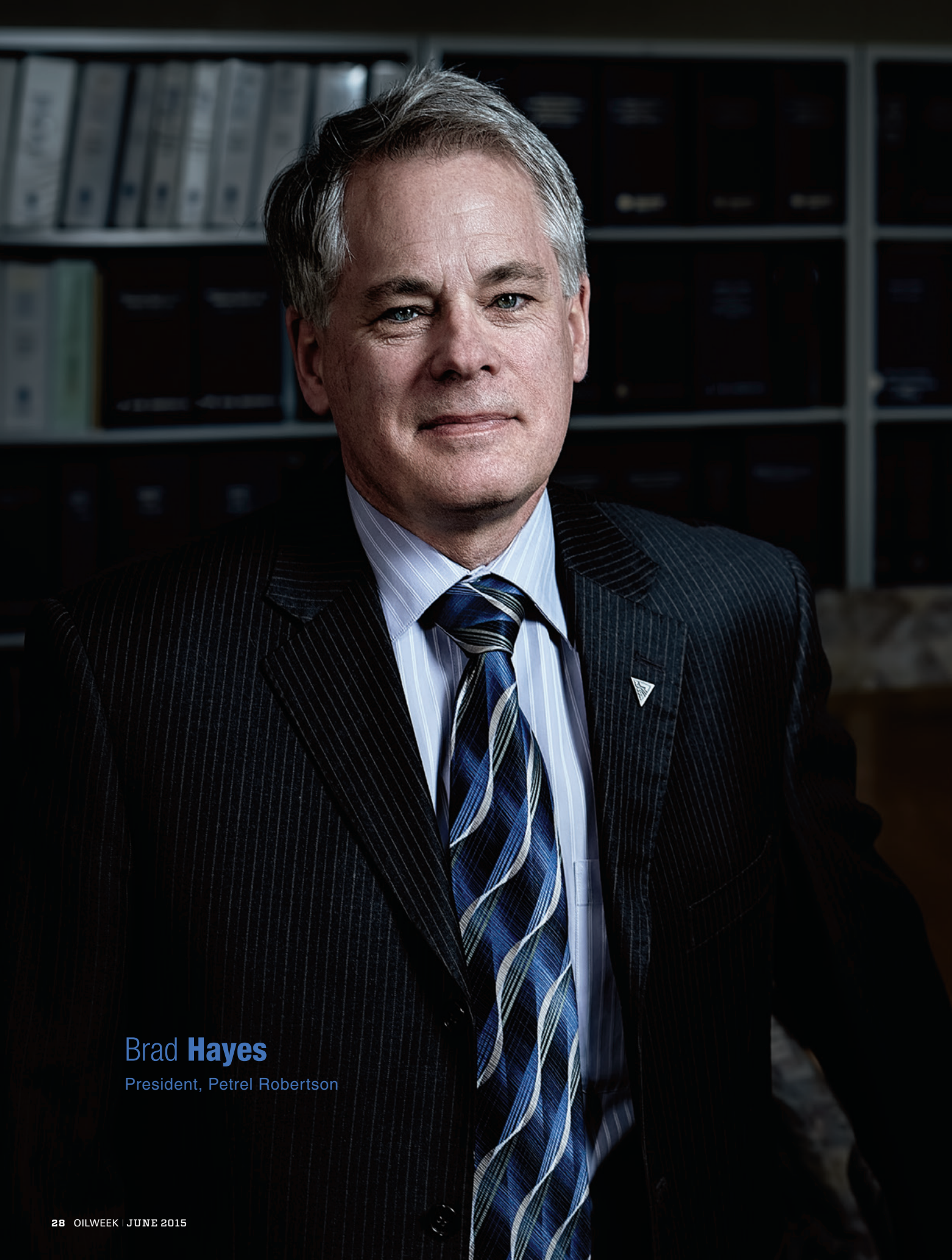

Brad **Hayes**

President, Petrel Robertson

HARD CEILING

SHALE OIL MAY HAVE SHORTER LEGS THAN ORIGINALLY EXPECTED

The rise of tight oil production in North America and its effect on world oil prices has been nothing less than spectacular. The resulting oil glut mirrors that of gas following the shale gas revolution a half decade earlier. In the long run, however, shale oil may play a smaller role in the energy mix because of some fundamental geophysical differences.

"It's becoming more documented now that what usually happens in true shale reservoirs, where you've got these tiny pore spaces, is when you fracture it up, the gas will come out but, if there are liquids, the gas that's dissolved in the liquids starts to come out, dropping the liquids in the reservoir and then the liquids can't get out," says Brad Hayes, president of petroleum geoscience consulting firm Petrel Robertson.

"True shale reservoirs" is the key here. The prolific oil production of the Bakken is real. So is liquids-rich production in the Montney and other plays. But these are tight sandstones or carbonates, which are "very specific and most of them don't have the same sort of enormous regional potential as shale gas," Hayes says.

The U.S. Energy Information Administration (EIA) estimates that technically recoverable shale gas in the world's top 10 countries is a staggering 7,299 tcf—Canada consumes less than three tcf per year. It estimates recoverable shale oil worldwide at 345 billion barrels—Canada consumes well under a billion barrels per year.

"It's a pretty big number, 345 billion barrels of recoverable shale oil worldwide, but I don't think we will get anywhere near that number," Hayes says. "People working on individual plays and looking at the assessments are starting to come around to the view that if it's a true shale rock, you're unlikely to get a lot of oil out of it at all."

The Duvernay shale is a good example of this recognition. Industry scrambled to take up positions across the Duvernay, from the deep gas window in the mountains to the shallower oil window that opens into the prairies. But virtually all the current production is liquids-rich gas in the foothills.

Hayes recalls a conversation from a couple years ago with a reservoir engineer working for one of the early entrants in the play, who summed up the reality that applies to many shale oil plays. "He told me, 'There's not going to be any oil coming out of the Duvernay because there's not enough energy in the reservoir to get it out.'"

On the continuum between liquids-rich gas and shale oil, the most promising shales tend towards gas. The big Canol Play in the Northwest Territories has huge potential, but it's liquids-rich gas "and producing liquids-rich gas at Norman Wells is not a good thing because there's no gas pipeline," Hayes says. "If there were a gas pipeline, it would be a wonderful play. Until then, it's going to be dead in the water."

This rethinking of shale oil finds an extreme example in California's Monterey shale. Early EIA estimates of recoverable Monterey shale oil in 2011 topped 15 billion barrels. That turned out to be vastly overstated and was downgraded by 96 per cent last year to virtually nothing, raising questions about the sustainability of the U.S. energy boom.

Canada has some great tight oil plays, Hayes says, but they are typically finite fairways. "Companies are really starting to see the limitations of these reservoirs, particularly in the current price setting," he adds. "These reservoirs aren't over-pressured for the most part, so they perform for a bit and then go into decline suddenly. Even with EOR [enhanced oil recovery], it's still not as good as a shale gas reservoir."

Hayes' message, which he will be taking to a variety of upcoming industry events, is that not enough work has been done on enough formations for these oil resource play limitations to widely sink in to the industry's consciousness.

"But if I'm right, the sooner it becomes apparent that there's indeed a very hard ceiling to the potential of light tight oil and that there's not going to be this endless supply of oil as there is of shale gas, then that in itself will help the markets start to rebound." ■

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