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# The Evolution of Montney Development

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## Background

The Montney has been the target of oil and gas exploration since the 1960s. Early development focused on conventional shoreface-related sandstone and dolostone reservoirs near the Montney subcrop edge. Production from these targets peaked in the late 1980s at approximately 60 mmcf/d and 13,000 bopd. Through the 1990s, focus shifted toward the turbidite trends in the Peace River Arch (PRA) area, increasing gas production to approximately 0.5 bcf/d. These higher permeability reservoirs are encased in tight siltstone reservoir rock within the unconventional part of the formation. These siltstones remained largely undeveloped until 2005 when horizontal drilling and multi-stage hydraulic fracturing made it possible to economically develop this areally extensive unconventional resource.

The Montney is now one of the most active and prolific resource plays in North America (figure 1). Current daily production is 1.59 mmboe/d, comprising almost 40% of Canada's non-oil sands production (BMO, 2022). The expected ultimate potential of the Montney in Alberta and northeastern British Columbia is 12,719 billion $m^3$ (449 tcf) of marketable natural gas, 2,308 million $m^3$ (14,521 mbbls) of marketable natural gas liquids and 179 million $m^3$ (1,125 mbbls) of marketable oil (NEB, 2013).

## Shifting Trends

Shifts in Montney target trends occurred in tandem with advances in drilling and completion technology, as well as step changes in geological interpretations and concepts involving the interplay of stratigraphy, structure, depositional and diagenetic history, and hydrodynamics. This presentation will outline the key ideas put into play with each phase of Montney development, along with a summary of the work being done to solve current problems and assess future opportunities.

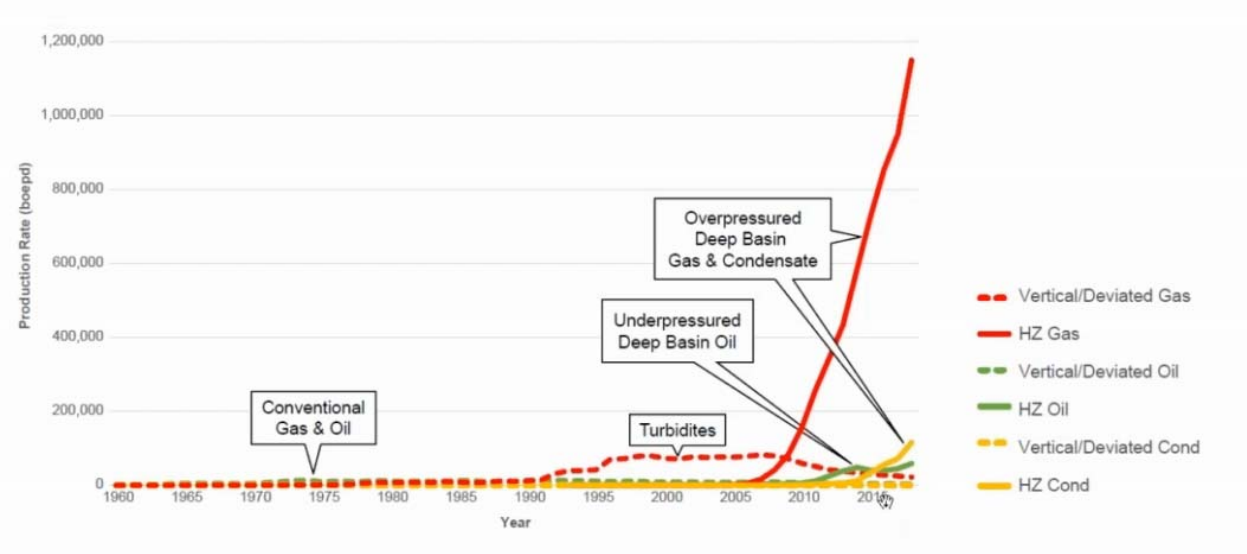
## Evolving Understanding and new Opportunities

Facies identification played a key role in the early, conventional phases of Montney development, when high porosity, high permeability shoreface deposits were the only viable targets. As horizontal drilling and multi-stage fraccing opened up a much larger unconventional resource, many other factors needed to be considered in Montney development decisions. Understanding phase changes and liquids distribution within the high-maturity Deep Basin requires knowledge of both hydrocarbon generation and migration. Controls include temperature and pressure (both at maximum burial and at the present day) and the presence of gas and liquids migration pathways, whether through structure (Peace River Arch faults) or lithology (high-porosity trends). Further complexities arise from phase variation on a stratigraphic basis (Lower Montney vs Upper Montney). All of these variables necessitate multiple recovery strategies at the field, pad, and even individual well levels.

As Montney development progressed, strategies have evolved to deal with newer issues such as surface use restrictions, lack of infrastructure access, and parent-child well interference.

A major opportunity lies with ongoing LNG export facility construction efforts on Canada's West Coast. If one or more are completed, the Montney is well positioned to provide feedstock as a potential offset to global coal and other high-$CO_2$ energy-based emissions. This may accelerate development along the Montney's deeper, western reaches, where drier gas is present. This area has been relatively neglected in recent years as operators have focused on liquids-rich gas production to the east.

Figure 1: Montney Production By Year

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