

## Analysis of Oil and Gas Production in the Arctic National Wildlife Refuge

### Synergies with the Alaska Gas Pipeline

The Alaska natural gas pipeline faces three types of business risk: gas market price risk, pipeline construction cost risk, and resource availability risk. Gas price risk is associated with the potential that future lower 48 natural gas prices might be too low to recover all pipeline and production costs, along with an adequate rate of return. Gas market price risk is further enhanced by the 9- to-10-year permitting and construction period for a gas pipeline, which increases the possibility that lower 48 gas market conditions and prices could have changed considerably by the time the pipeline goes into operation. For example, more than 35 North American liquefied natural gas (LNG) terminals, with more than 30 billion cubic feet of daily delivery capacity, have been proposed for completion over the next decade. Some analysts have concluded that LNG imports are a less expensive gas supply option for the lower 48 than the transportation of gas from the Alaska North Slope.<sup>17</sup> If this is true and if a significant portion of the proposed North American LNG capacity is built, then gas prices might be lower than the breakeven cost for gas transported by an Alaska gas pipeline.

The last two *Annual Energy Outlooks* have projected a need for both new LNG terminals and an Alaska gas pipeline to satisfy future natural gas consumption requirements. However, no new LNG terminals have been built since the 1970s, and LNG terminal project sponsors are faced with local siting issues, because many landowners do not want such facilities situated near them.

The risk of potential economic loss is also increased by the possibility that an Alaska gas pipeline might experience significant construction cost overruns, as happened with the construction of TAPS. A significant construction cost overrun could result in an Alaska gas pipeline being uneconomic upon its completion, especially if lower 48 gas prices decline substantially.

A gas resource risk exists because gas producers have proven the existence of 35 trillion cubic feet (tcf) out of the 51 tcf of natural gas needed to supply an Alaska gas pipeline.<sup>18</sup> Of the 35 tcf of proved recoverable natural gas assets that have already been found on State lands in the Alaska North Slope, about 26 tcf reside in the Prudhoe Bay Field, about 8 tcf reside in the Point Thomson Field, with the remainder located in various other fields. The difference between the 51 tcf required for a pipeline and the 35 tcf of proved gas resource constitutes a requirement to discover an additional 16 tcf of recoverable gas resources for an Alaska gas pipeline.

Other areas of the Alaska North Slope besides ANWR are expected to hold considerable natural gas resources, which are sufficient to cover this 16-tcf deficit. In particular, the NPRA portion of the North Slope is estimated to contain between 40 to 85 tcf of technically recoverable non-associated gas resources and 7 to 17 tcf of technically recoverable associated-dissolved gas resources.<sup>19</sup> The NPRA is already being leased for oil and gas development, with the eastern portion of NPRA under an active exploration program.

In contrast, the USGS estimates that the technically recoverable non-associated natural gas

resources available in the ANWR coastal plain are between 0 and 11 tcf, with a mean estimated value of 3.8 tcf.<sup>20</sup> An additional 2.3 to 5.2 tcf of technically recoverable associated-dissolved natural gas is estimated to exist in the ANWR coastal plain, with a mean estimate of 3.6 tcf.<sup>21</sup> So, under the mean gas resource estimates, total associated and non-associated ANWR coastal plain gas resources are estimated to be 7.4 tcf, which is less than half of the 16 tcf necessary for the gas pipeline. Even the 5-percent probability estimates (a 1-in-20 chance) for associated-dissolved and non-associated gas resources just barely cover the 16-tcf gas resource deficit. Consequently, opening the ANWR coastal plain to petroleum development might reduce the resource risk associated with an Alaska natural gas pipeline, but only marginally, because the expected size of the NPRA gas resource base is so much larger and because NPRA is already under an active leasing and exploration program.<sup>22</sup>

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