Sustainable Exploration, Development and Production of Tight Oil and Gas
US Production Projections

Crude oil production
million barrels per day

Reference
2018 history projections

25
20
15
10
5
0

2000 2010 2020 2030 2040 2050

tight oil
Alaska
Gulf of Mexico
other

Risk Factors

Community Issues
Induced Seismicity
Setbacks
Traffic and infrastructure; engine noise, local pollution, set backs

Atmospheric Issues
GHG Emissions
Local Air Quality
Traffic and engine emissions, well isolation, VOC and GHG emissions, pipeline leaks

Industrial Processes

Regional Issues

Water Issues
Surface Water
Groundwater
Large number of wells, water quantity, water quality, wastewater disposal

Land Issues

Ecosystem Impacts
Disturbance
Well locations, access, production practices, fragmentation of open space and ecosystems

Zoback and Arent, 2014, The Bridge

“The rise in US production of tight oil and shale gas since 2010 is the largest parallel increase in oil and gas output in history”

International Energy Agency, World Energy Outlook, 2018

Source: US Energy Information Agency
Annual Energy Outlook 2019

NAE Emerging Issue in Earth Resource Engineering