

SEG 2023 Conference: Resourcing the Green Transition

A Shift to Natural Gas, Nuclear, and Ocean Mining Could Initiate an Adequate and Resource-Viable Green Transition

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M. King Hubbert's prediction in 1956 of peak U.S. hydrocarbon production and decline only departed from actuality when an entirely new petroleum resource was developed. The sources of conventional oil at the time were diverse and the demand/reward for new discoveries within the U.S. was strong, but Hubbert's predictions remained accurate until unconventional shale gas sources were brought online in the 2000s. This suggests that the predicted trajectory of metal production from mature methods and districts will not depart from expected trends unless and until entirely new sources are developed. The expected trends are very far from what would be required for the kind of green transition currently discussed. Ocean resources constitute a vast new resource that could change the metal production trajectory on a several-decade timeframe. A green future may depend on starting to develop this resource now. In the meantime, CO₂ emissions can be reduced at close to acceptable rates by transitioning from coal and oil to natural gas and accelerating nuclear power generation. Transitioning to natural gas will reduce metal demand by sustaining fossil-fuel-based transportation and heating. Reliable baseload electricity from nuclear, which has the highest capacity factor and lowest levelized carbon emissions footprint of any energy source, can support and encourage transition to an electrical economy at rates that can be resource-supported. This approach appears viable. Other approaches may also be viable. The resource profession needs to effectively communicate the resource challenge to the public and political class and identify resource-viable pathways to zero carbon.