

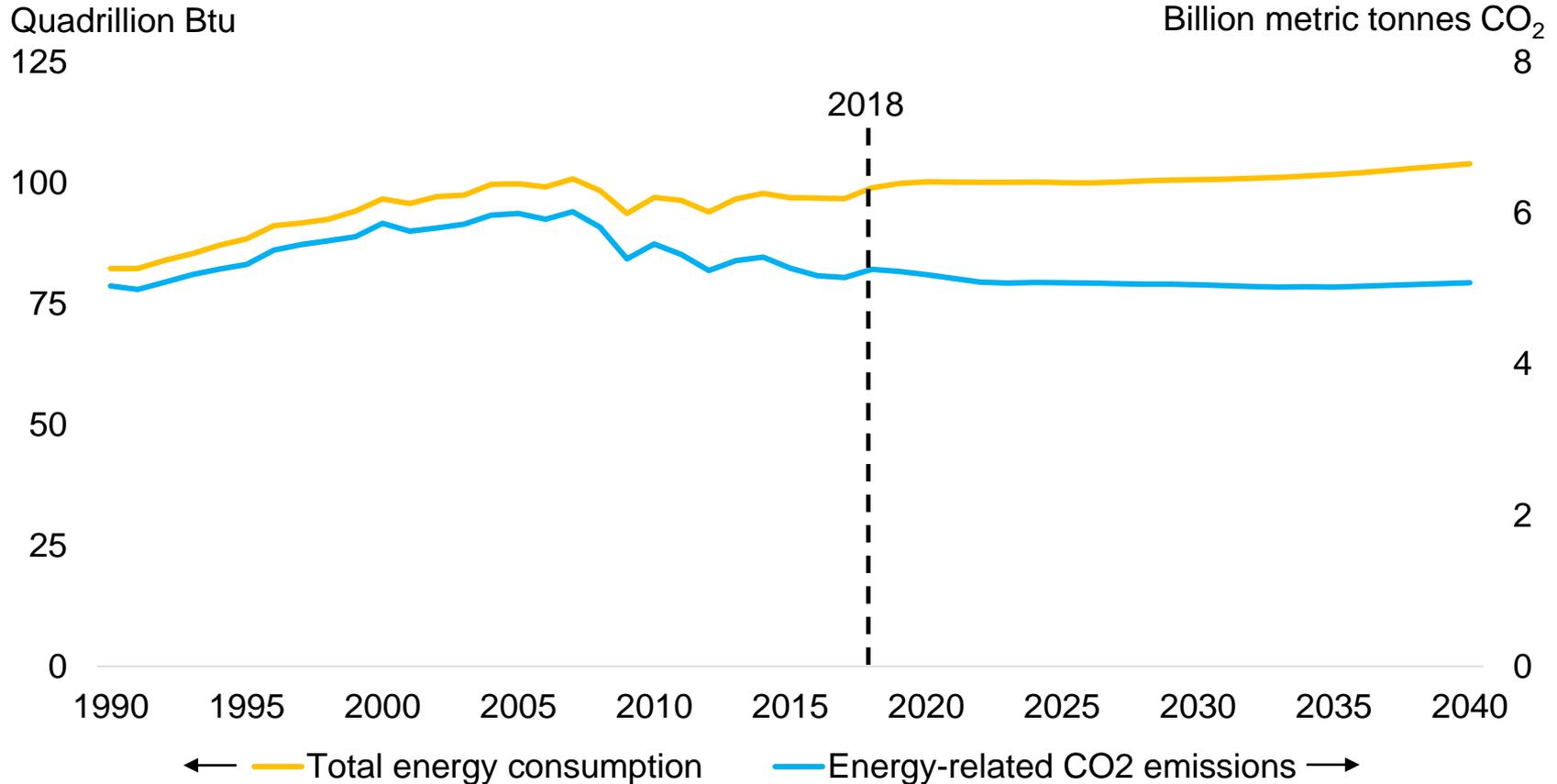
The criticality of natural gas

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- ▶ **Natural gas has keyed the United States' and Maryland's ability to satisfy energy demand while reducing energy-related emissions**
 - U.S. CO₂ emissions are at a 25-year low
 - The U.S. natural gas and oil industry leads in spending to reduce greenhouse emissions
 - Maryland's energy-related emissions fell by 28.9% between 2005 and 2015
 - Natural gas enables intermittent renewables in power and is a feedstock in manufacturing
- ▶ **Maryland's increased utilization of abundant and low-cost natural gas has lowered consumer electricity prices**
- ▶ **While Maryland has missed out on many of the demonstrable benefits to upstream energy development, it is poised to grow as a LNG exporter**

Increased natural gas use and energy efficiencies have reduced U.S. CO₂ emissions as energy demand grows

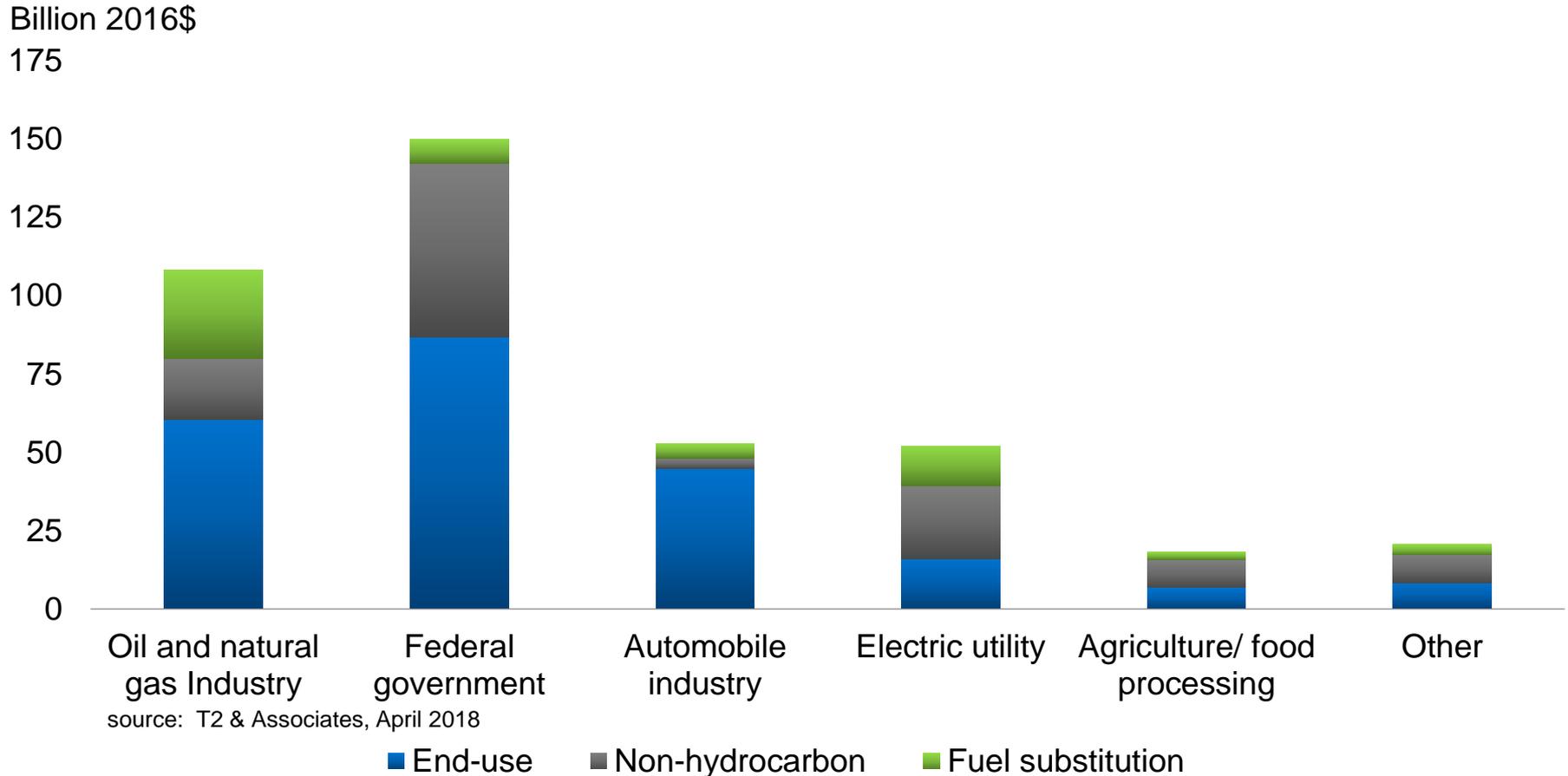


source: EIA AEO (2018)

- Since 2005, total energy-related CO₂ emissions declined faster than total energy consumption, due largely to natural gas substitution for coal in power
- As energy consumption grows in the future, energy efficiency improvements and increased renewables and natural gas use should restrain CO₂ emissions

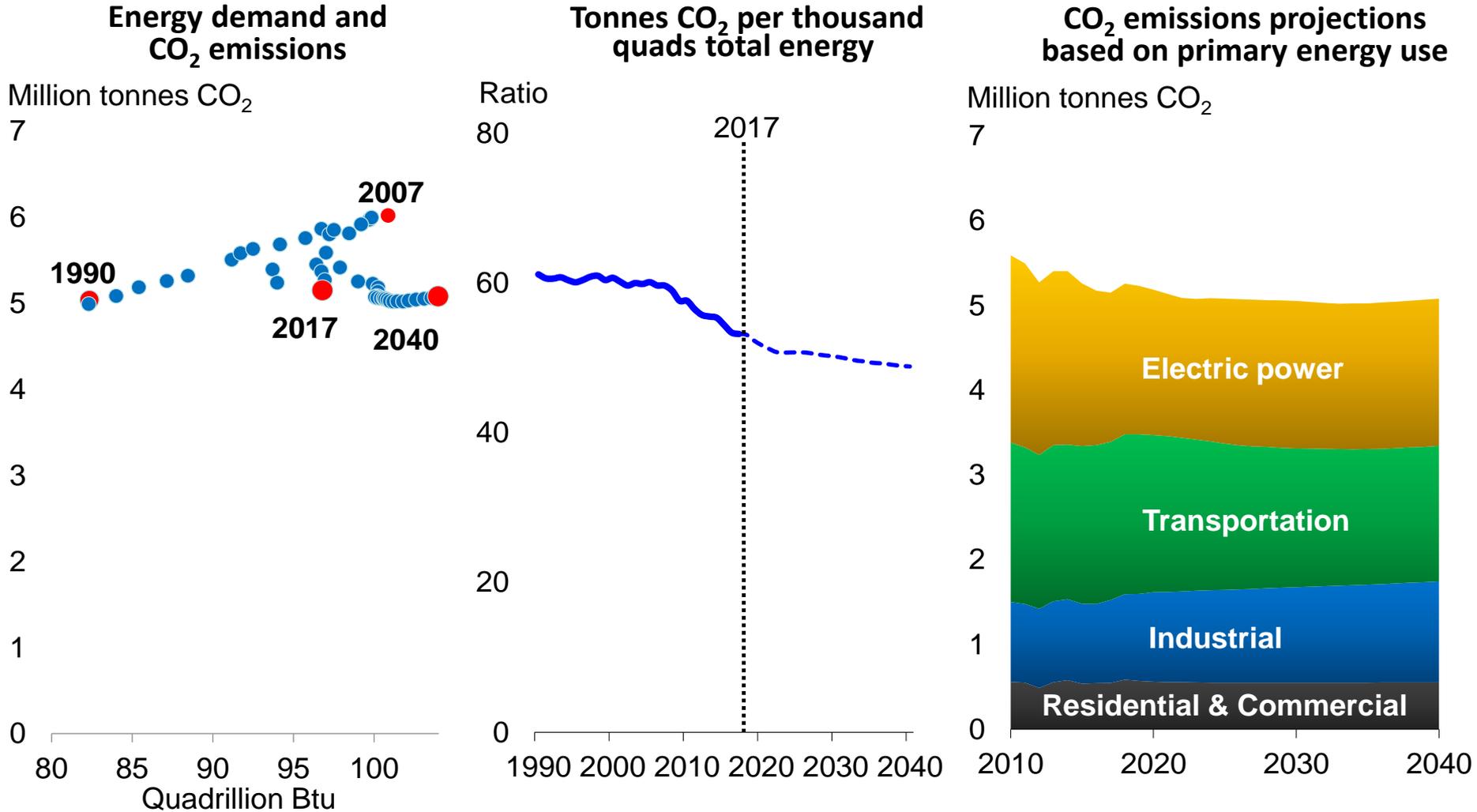
U.S. natural gas and oil industry spends billions on greenhouse gas-reducing technologies

Carbon mitigation investment by investor group (2000-2016)



- Between 2000 and 2016, natural gas and oil industry spending on carbon mitigating technologies was more than double that of every other individual industry

EIA projects U.S. CO₂ emissions will continue to decline as energy efficiency improves



source: EIA AEO (2018) and API calculations

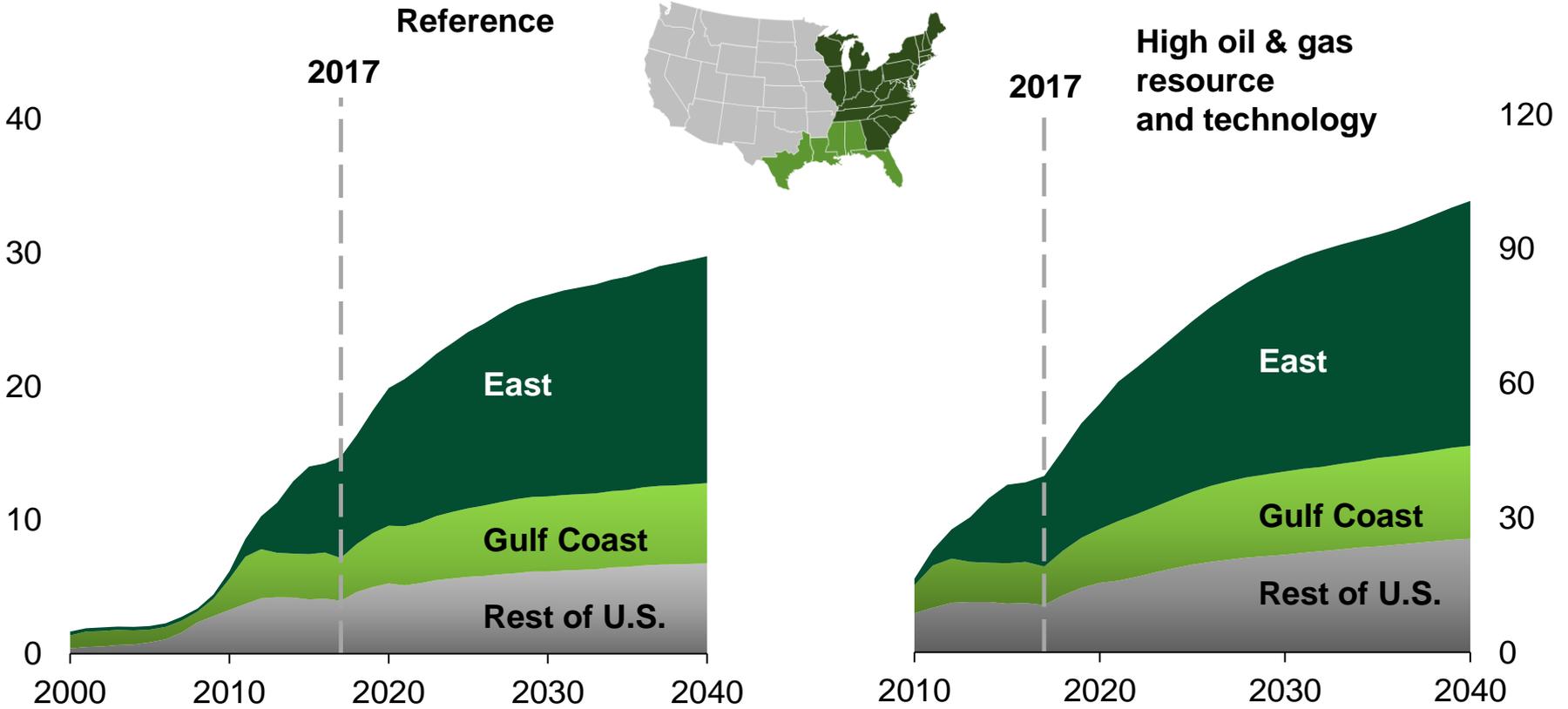
➤ The keys to the outlook are increased use of natural gas and renewables in electric power and improved energy efficiency

EIA expects the East to dominate U.S. natural gas production

Shale gas production by region

Trillion cubic feet

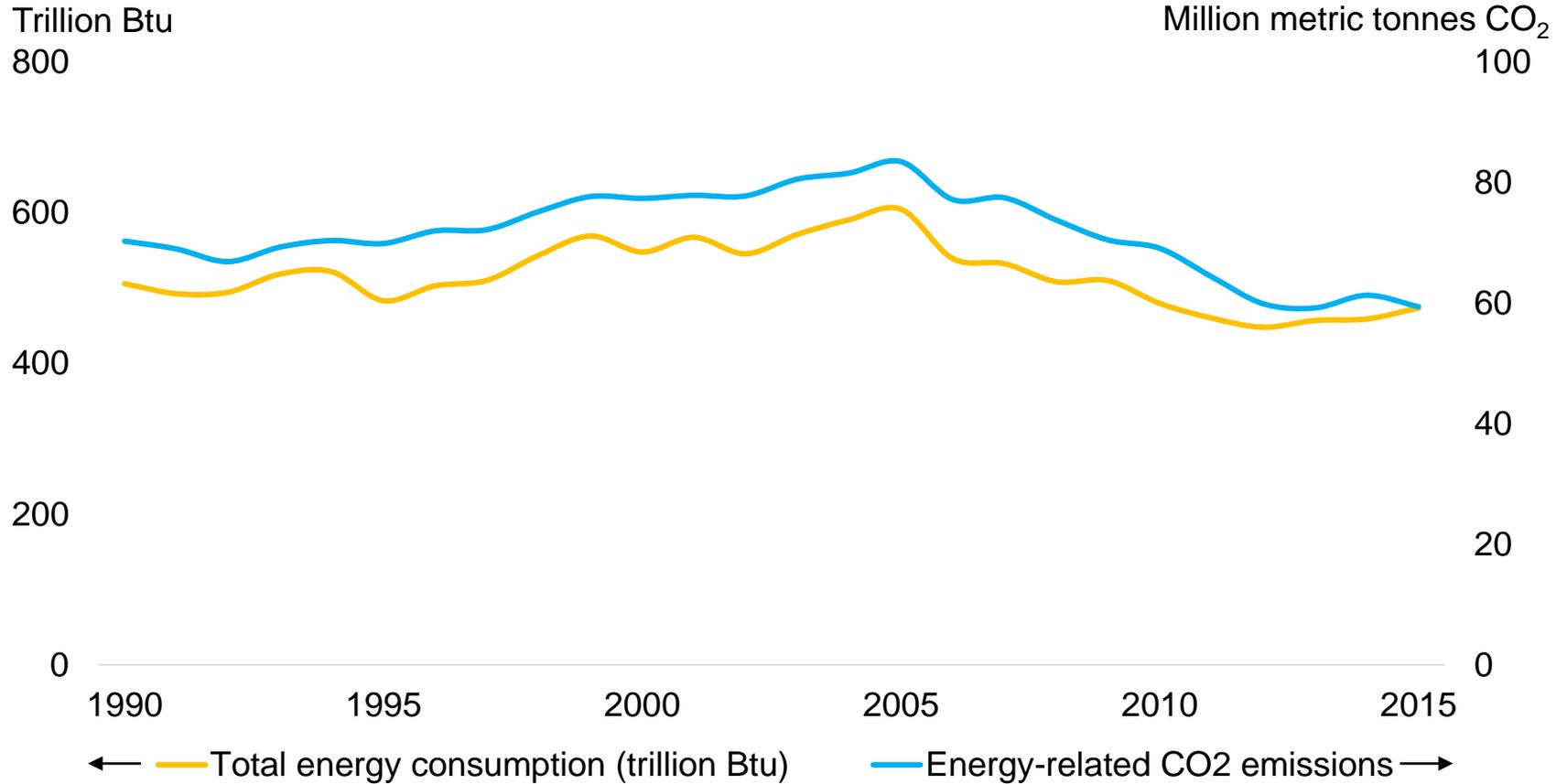
BCFD



source: U.S. EIA AEO (2018)

- Continued development of the Marcellus and Utica plays in the East is the main driver of growth in total U.S. shale gas production across most cases

Maryland's increased natural gas use and efficiencies reduced CO₂ emissions as energy demand grew

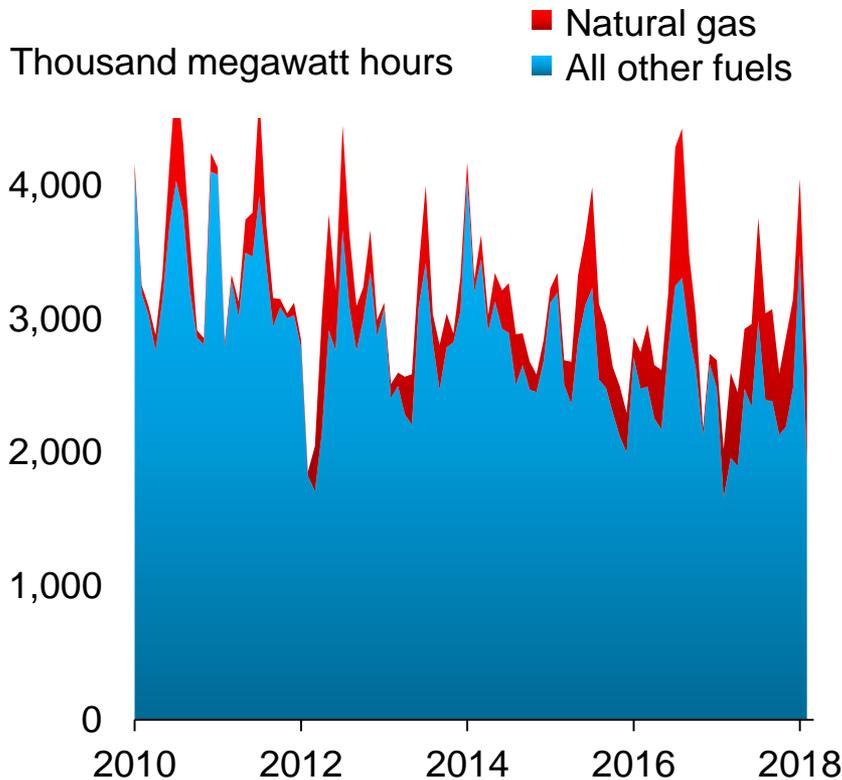


source: EIA SEDS (2018)

- Since 2005, Maryland's energy demand and energy-related CO₂ emissions have fallen. The largest shift was gas substitution for coal and oil in power

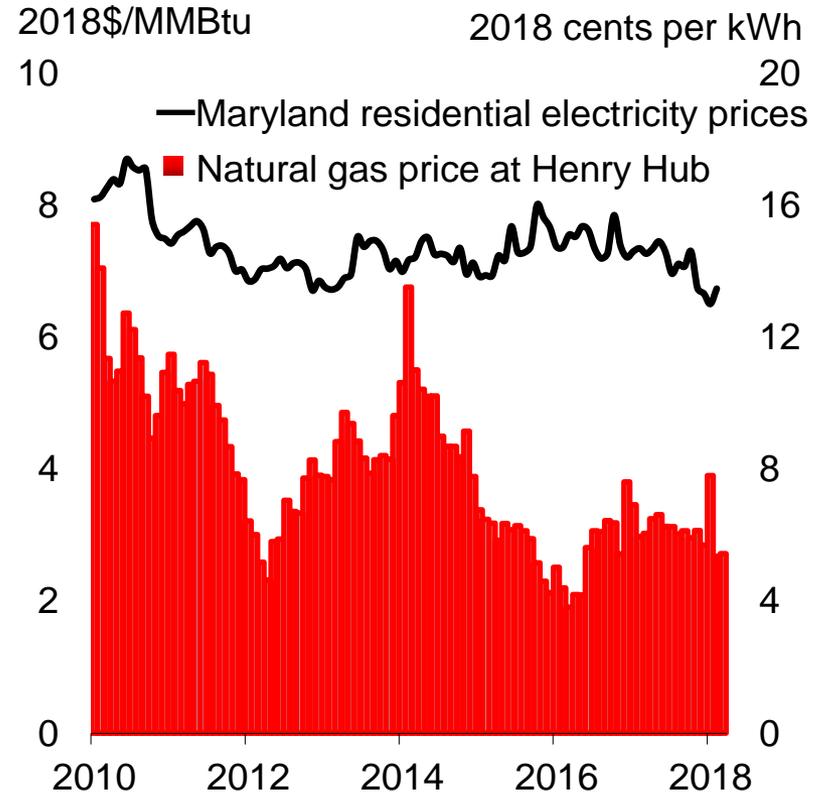
Increased utilization of abundant and low-cost natural gas lowered Maryland's electricity prices

Maryland electricity net generation



source: EIA

Lower natural gas prices decreased Maryland residential electricity prices

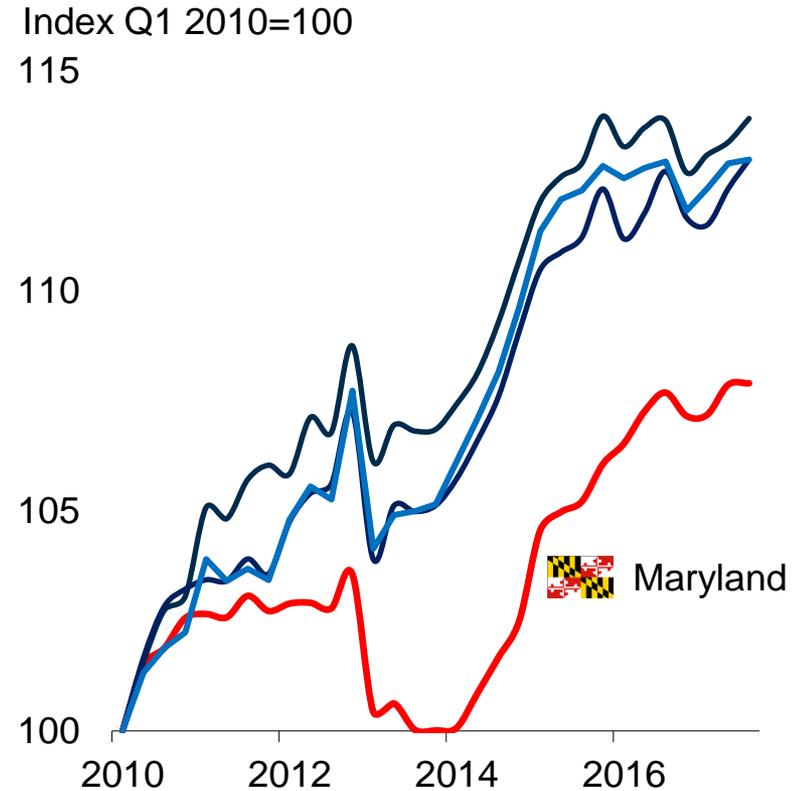
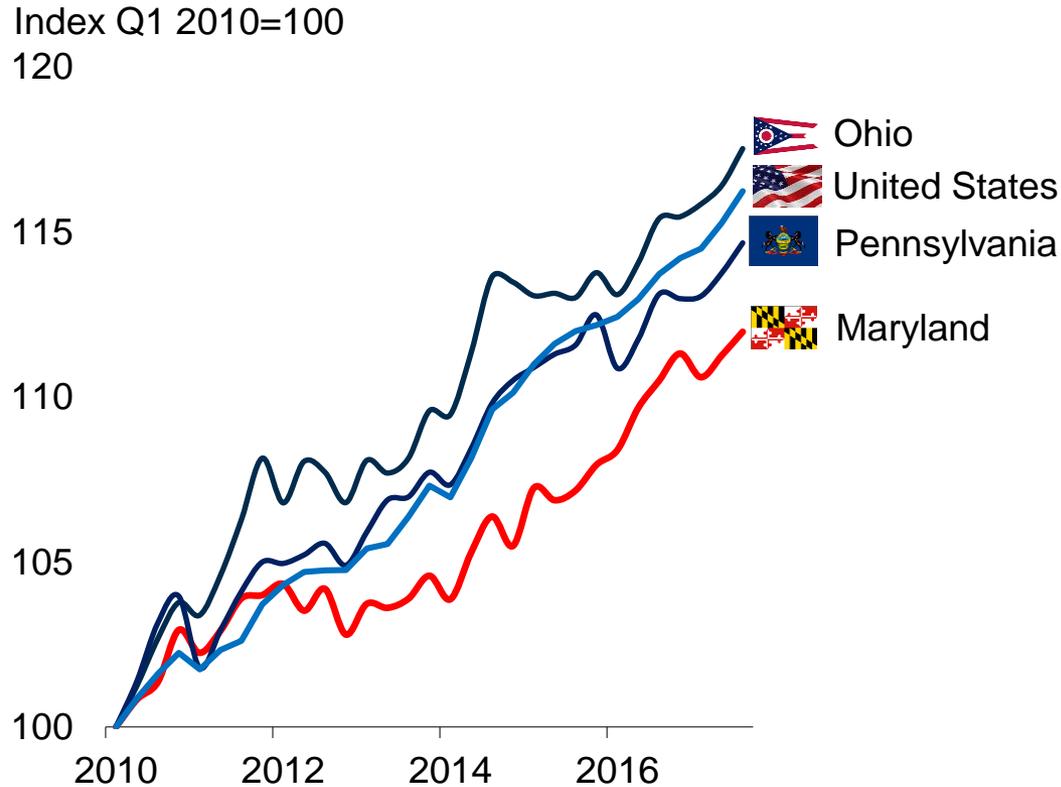


- In MD's generation mix, natural gas grew to nearly 20% in 2017 from 6% in 2010, which enhances grid resiliency and reliability
- Maryland electricity prices declined with those of natural gas

Maryland has lagged the nation and its energy-producing neighbors in economic and income growth

**Cumulative real GDP growth
Q1 2010 to Q3 2017**

**Cumulative real personal income per capita
Q1 2010 to Q4 2017**

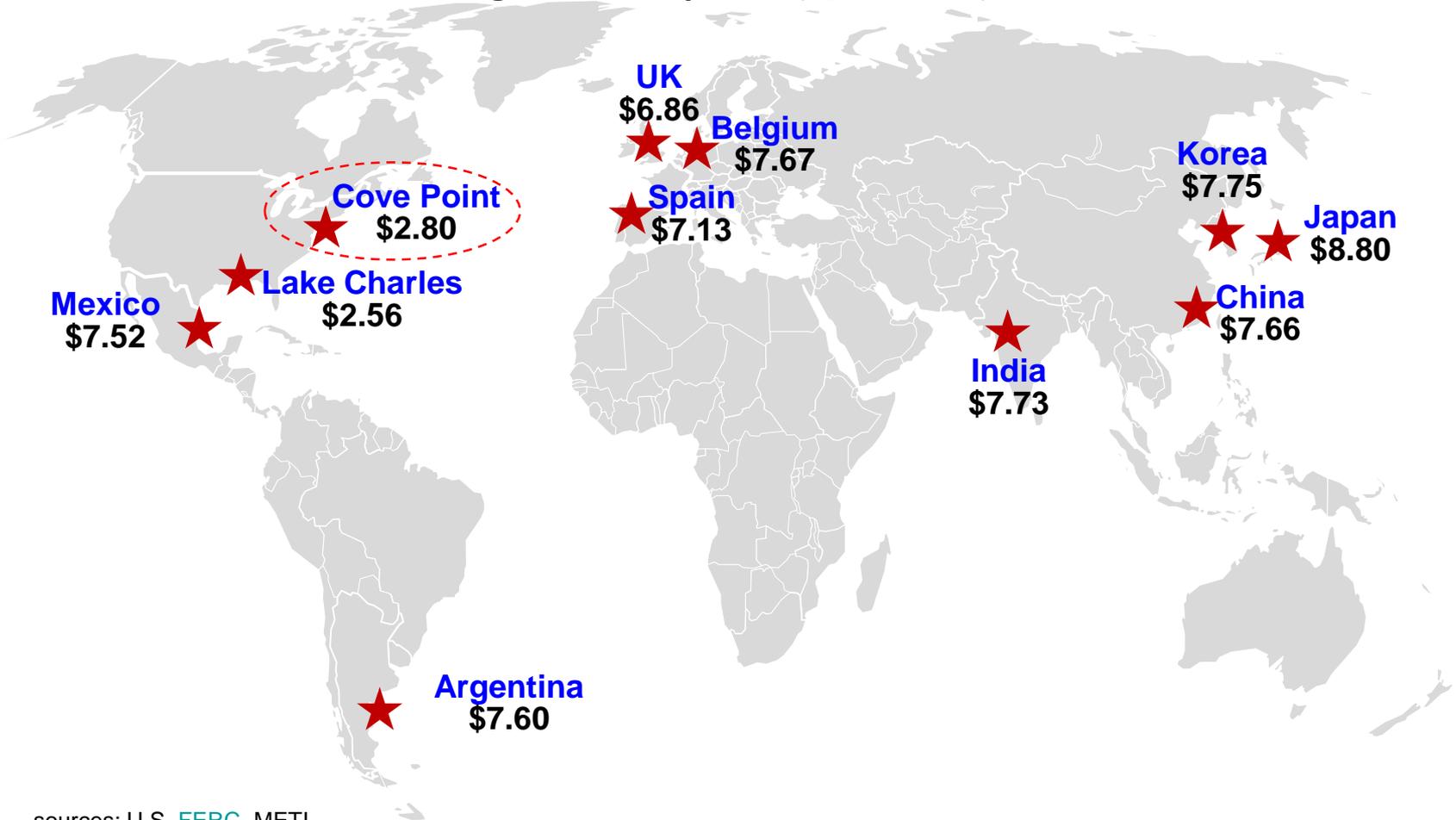


source: BEA

- Energy has propelled the economies of Ohio and Pennsylvania, while Maryland's growth has lagged
- In Q1 2010, Maryland's real per capita personal income was \$10,800 above the national average. As of Q4 2017, that premium fell by \$1,500 per capita

Maryland is poised to benefit from LNG production and exports

Global natural gas landed prices (\$/MMBtu) – March 2018



sources: U.S. [FERC](#), METI

- At the beginning of 2018, U.S. natural gas prices were less than half of international levels, which motivated U.S. production and exports