

# The Changing Energy Landscape and Its Effect on the Economy

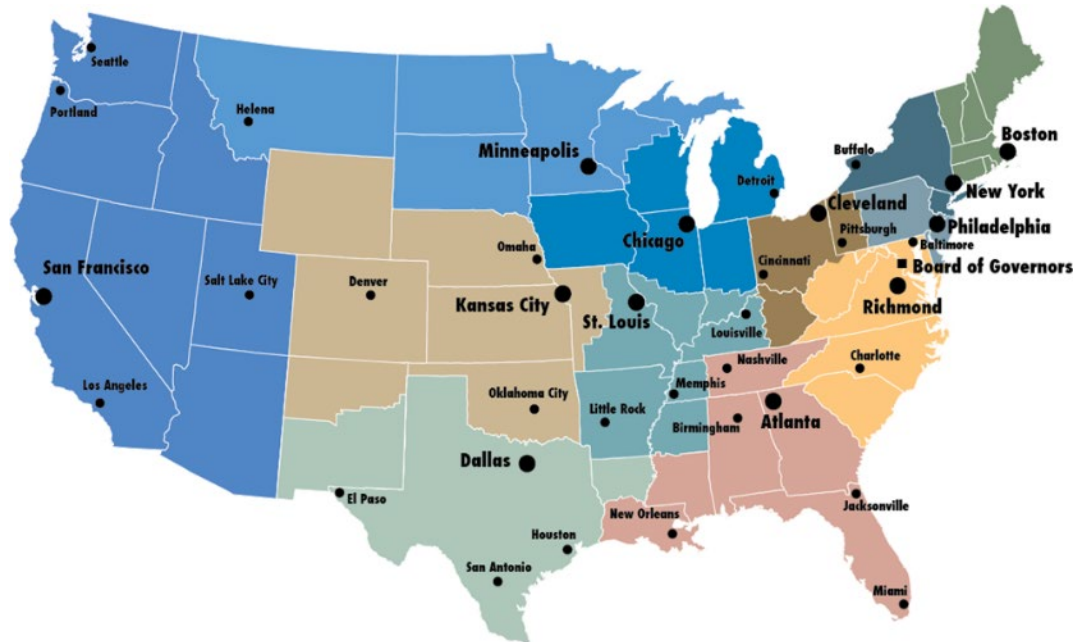
*Evening at the Fed*  
*April 7, 2021*

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\*The views expressed herein are those of the presenter only and do not necessarily reflect the views of the Federal Reserve Bank of Kansas City or the Federal Reserve System.



# Structure & Functions of the Federal Reserve



## The “Fed” consists of three main entities:

- Board of Governors: 7 members appointed by U.S. President
- Federal Reserve Banks: 12 total; semi-independent by design
- Federal Open Market Committee: 19 members; 12 voting

## Primary responsibility areas:

- Monetary policy
- Bank regulation
- Financial services



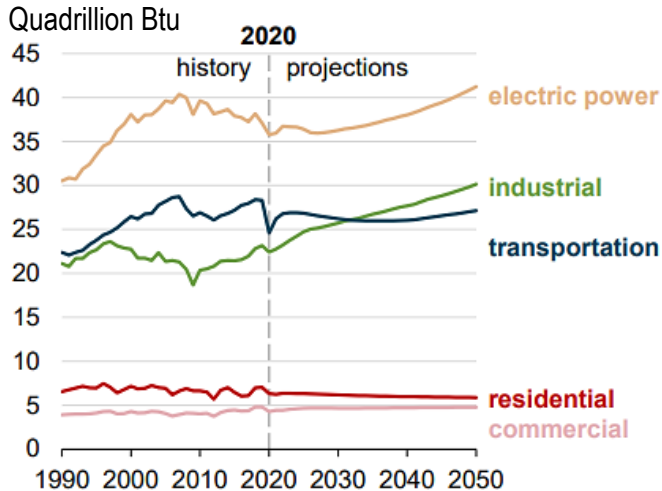
# Overview

- The mix of fuels used for energy in the United States is changing and is expected to change further in coming decades, as renewable energy grows
- The Tenth District economy has been and remains highly concentrated in the energy sector, especially in production of oil, natural gas, and coal
- The District also is well positioned for the transition to renewable energy, but the regional economy faces some disruptions as the transition occurs

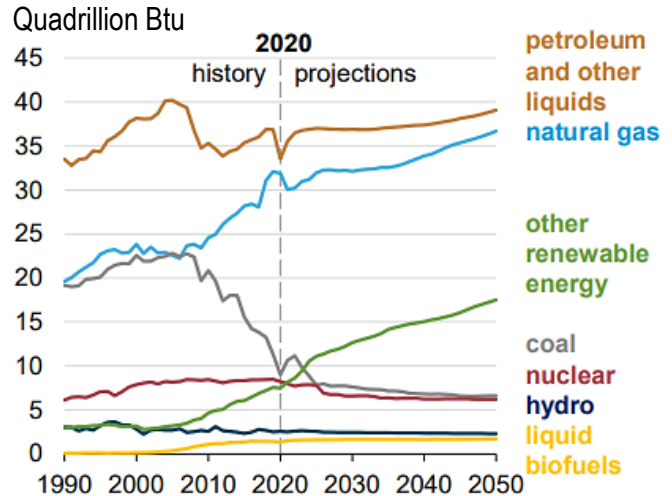


# U.S. energy usages has been and will continue to move toward more reliance on renewables

## U.S. Energy Consumption by Sector



## U.S. Energy Consumption by Fuel

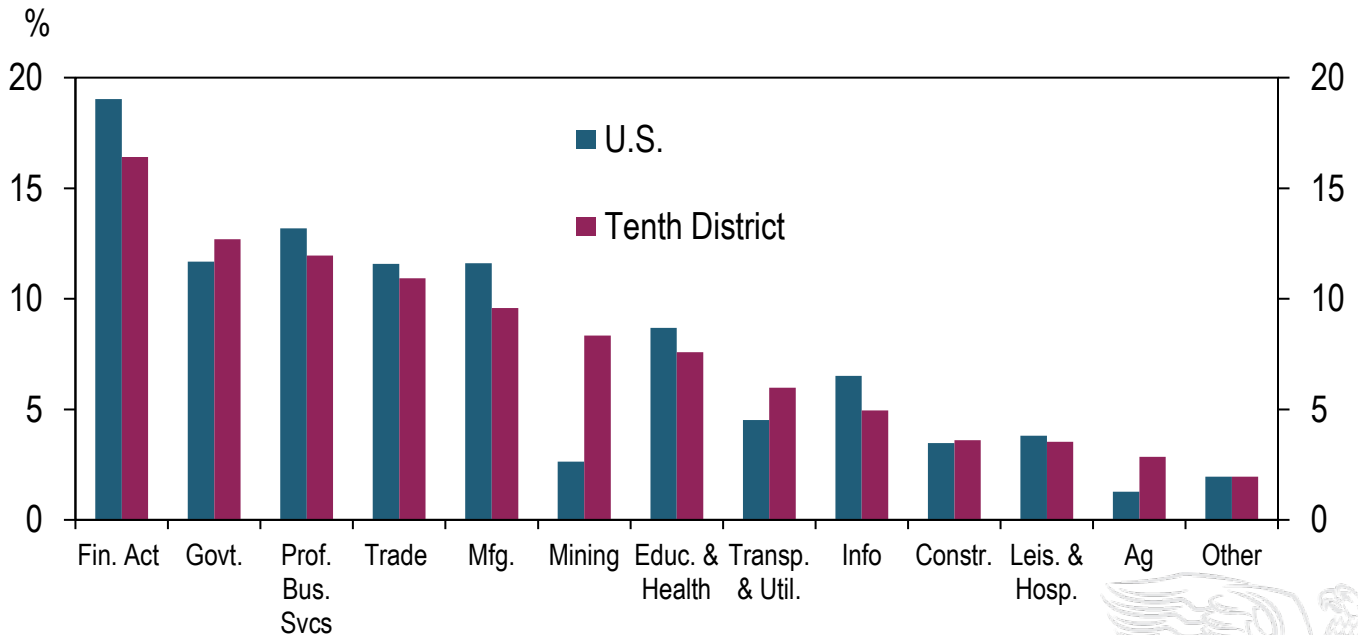


# Fossil Fuel Energy's Importance in the Tenth District Economy



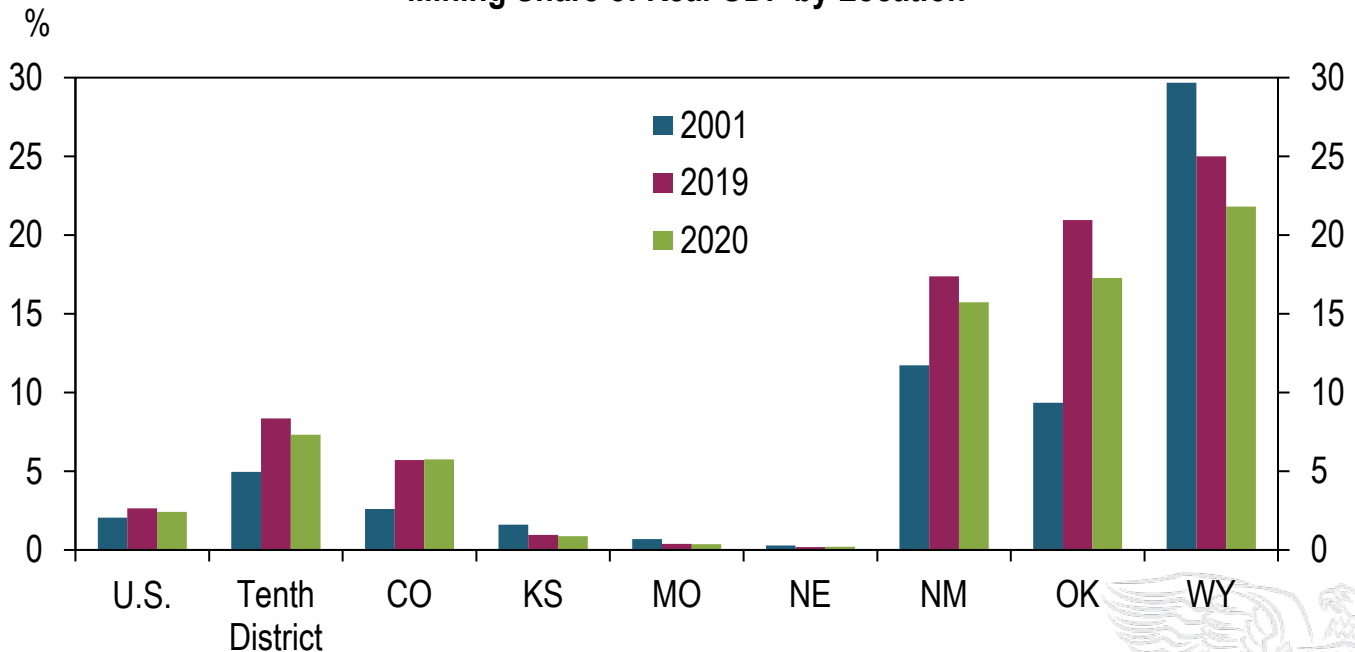
# Compared to the rest of the U.S., mining (oil, natural gas, coal) contributes 3 times as much to Tenth District GDP

Real GDP Share by Industry, 2020



# Mining's share of GDP fell slightly in 2020 but remains especially high in NM, OK, and WY

Mining Share of Real GDP by Location



# The Tenth District is home to some of the top producing states for traditional sources of fuel

## Top Fossil Fuel Producing States

2018 Rank	Coal	Natural Gas	Crude Oil
1	<b>Wyoming</b>	Texas	Texas
2	West Virginia	Pennsylvania	North Dakota
3	Pennsylvania	<b>Oklahoma</b>	<b>New Mexico</b>
4	Illinois	Louisiana	<b>Oklahoma</b>
5	Kentucky	Ohio	<b>Colorado</b>
6	Indiana	<b>Colorado</b>	Alaska
7	Montana	West Virginia	California
8	North Dakota	<b>Wyoming</b>	<b>Wyoming</b>

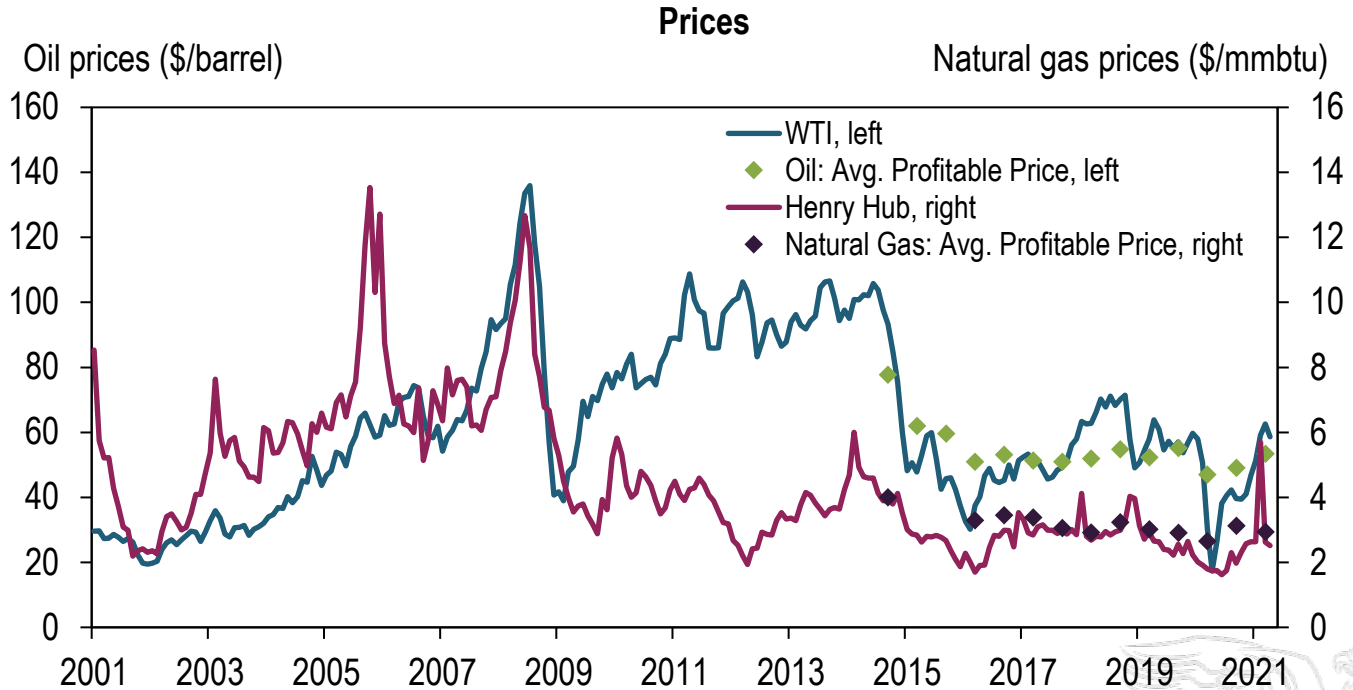




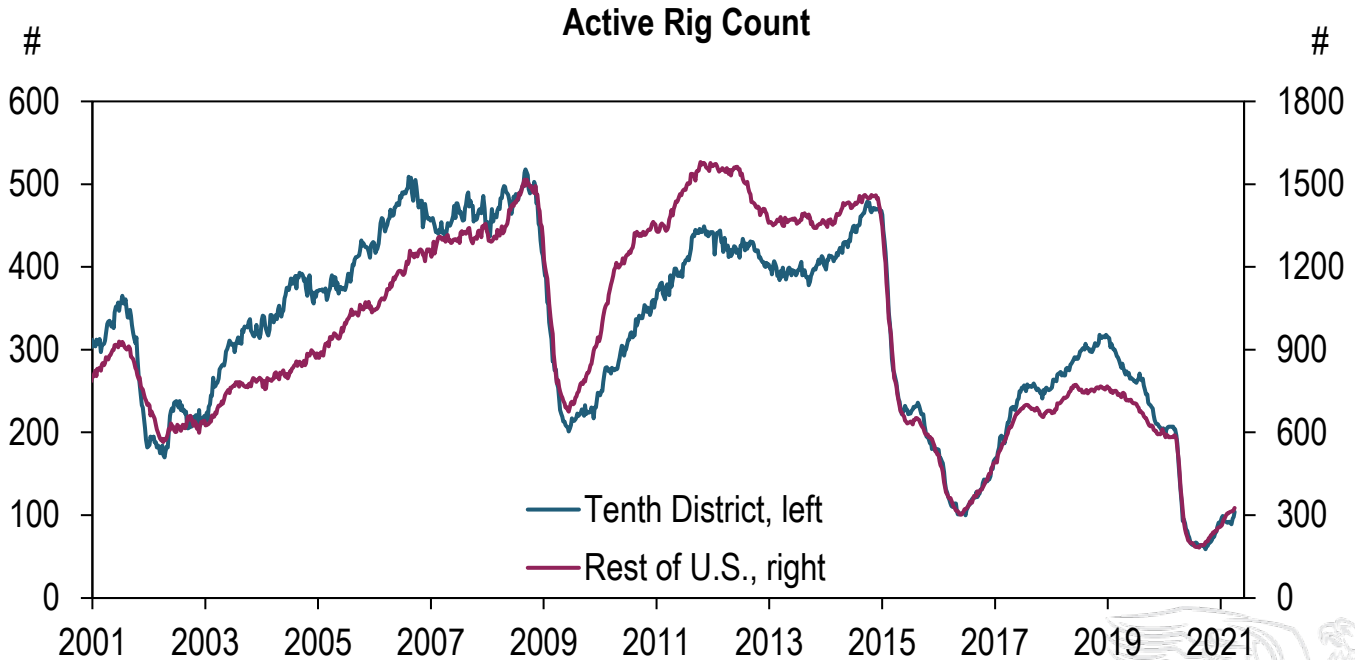
# Tenth District Oil and Gas in Recent Years



# After a boom in natural gas prices from 2003-08 and oil from 2009-15, prices have since stayed lower

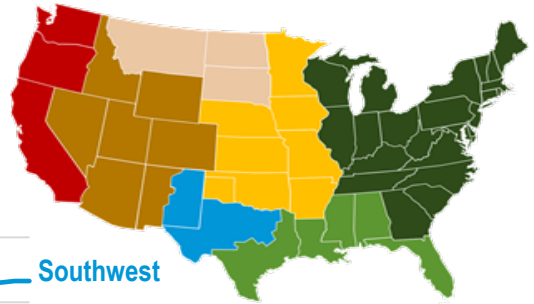
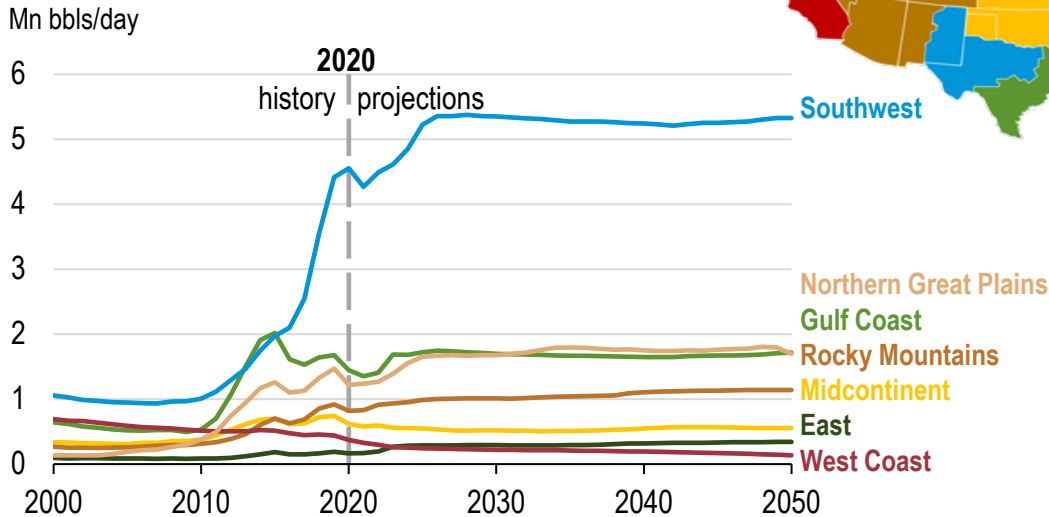


# Rig activity in the District reflects this, with a lower overall level of drilling, especially since COVID-19



# Recent and expected growth in oil production has mostly been in the Permian basin of TX/NM, not in the District

Onshore crude oil production in the Lower 48 states by region

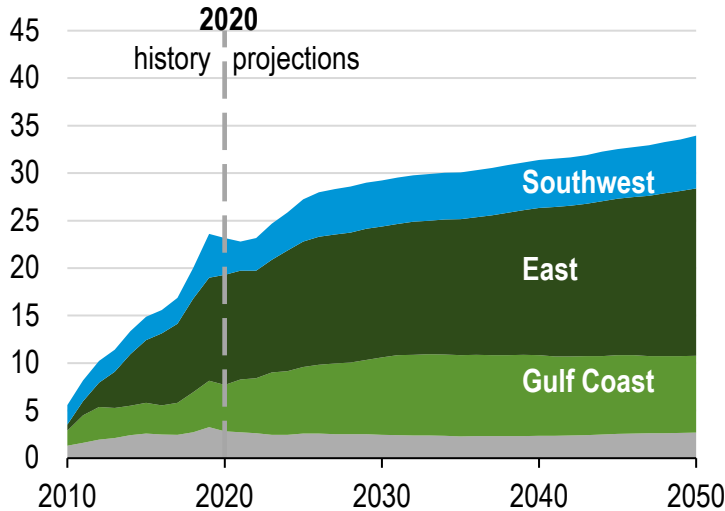


# For natural gas, the biggest growth has been in the eastern U.S., especially the Marcellus basin of PA

## U.S. Dry Natural Gas Production from Shale Resources by Region

### Reference case

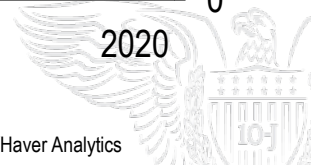
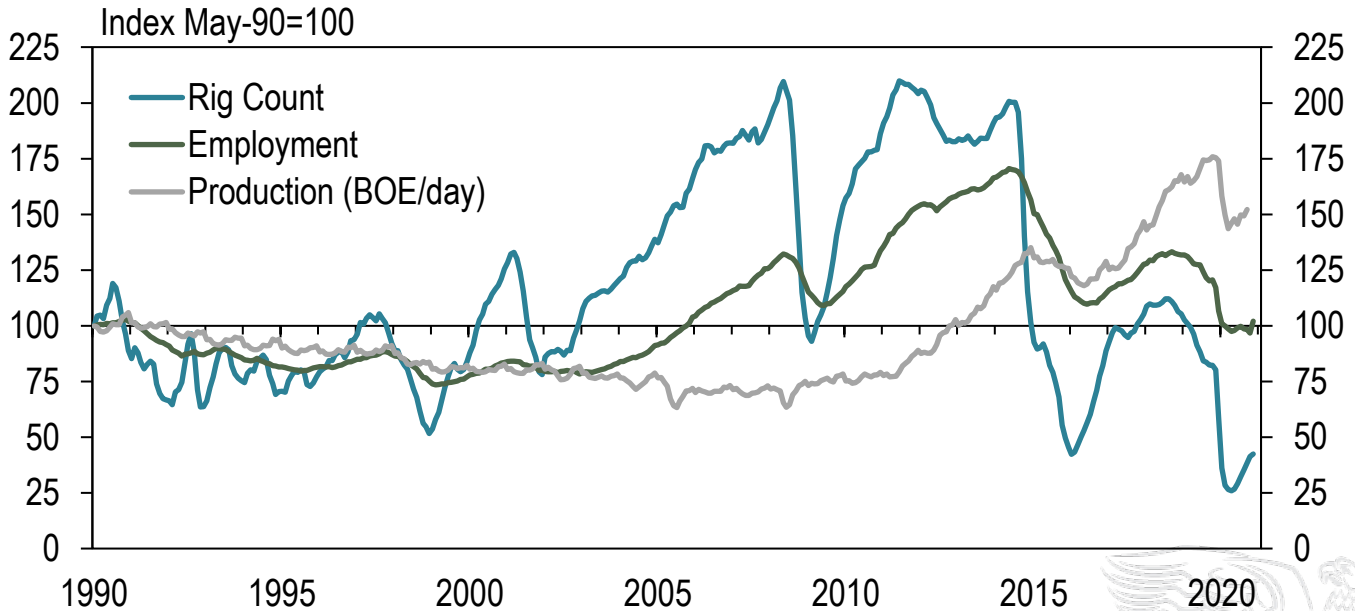
trillion cubic feet



Source: EIA

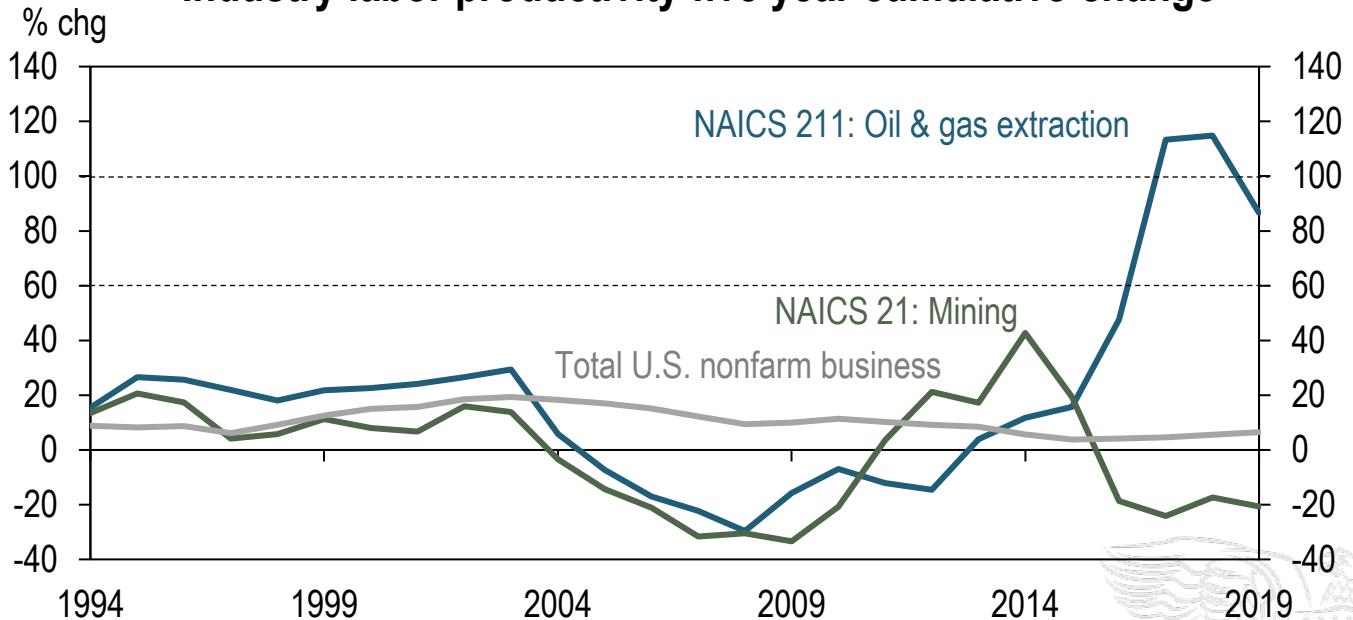
**In addition to regional movements, in recent years it takes considerably fewer workers to produce more oil and gas**

## U.S. Rig Count, Employment, and Production



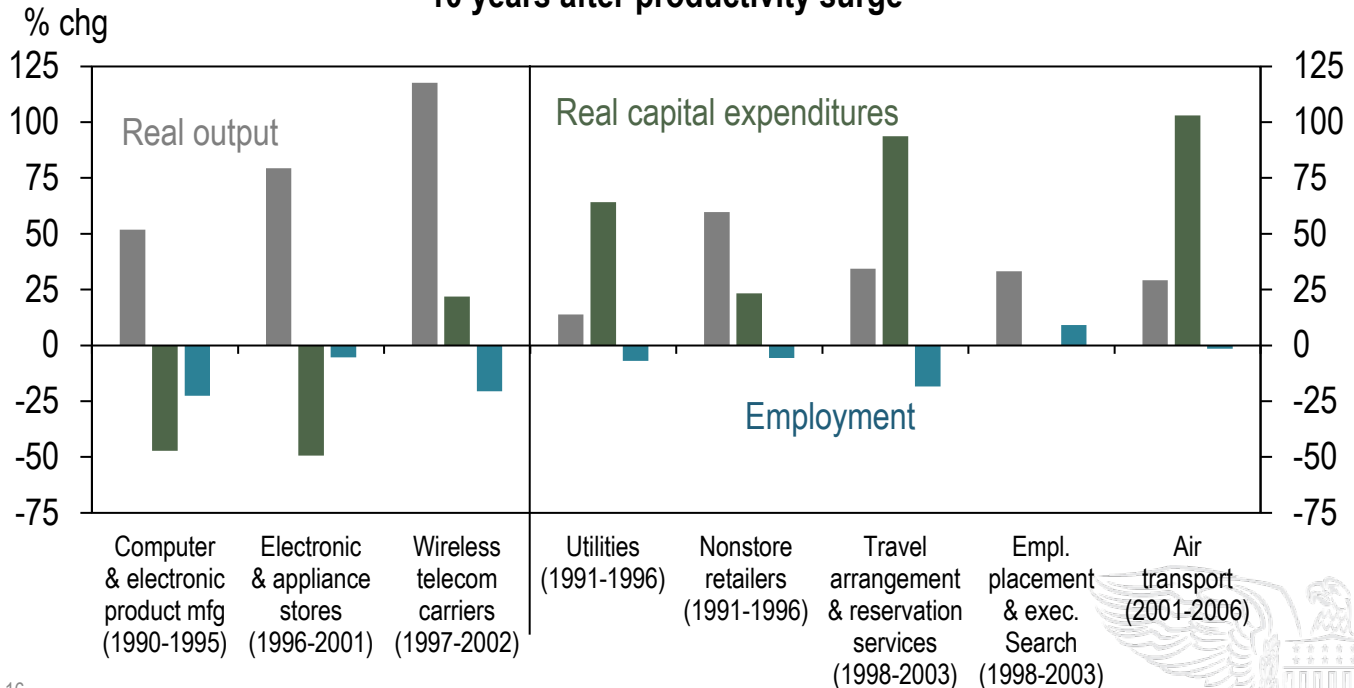
**Indeed, from 2012-2017, productivity (output per hour) in oil and gas doubled, and rose 60% in the broader sector**

**Industry labor productivity five year cumulative change**



# Only a select few industries have experienced productivity growth like that, and most grew further but reduced jobs

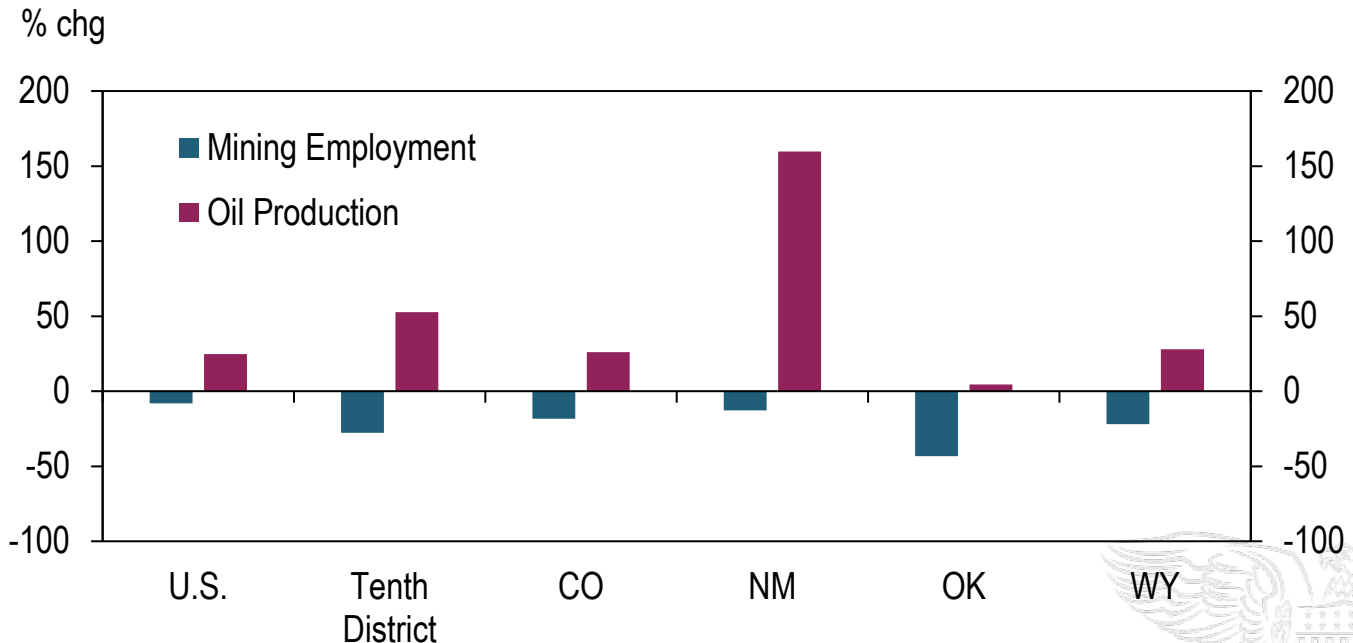
Change in output, investment, and employment  
10 years after productivity surge





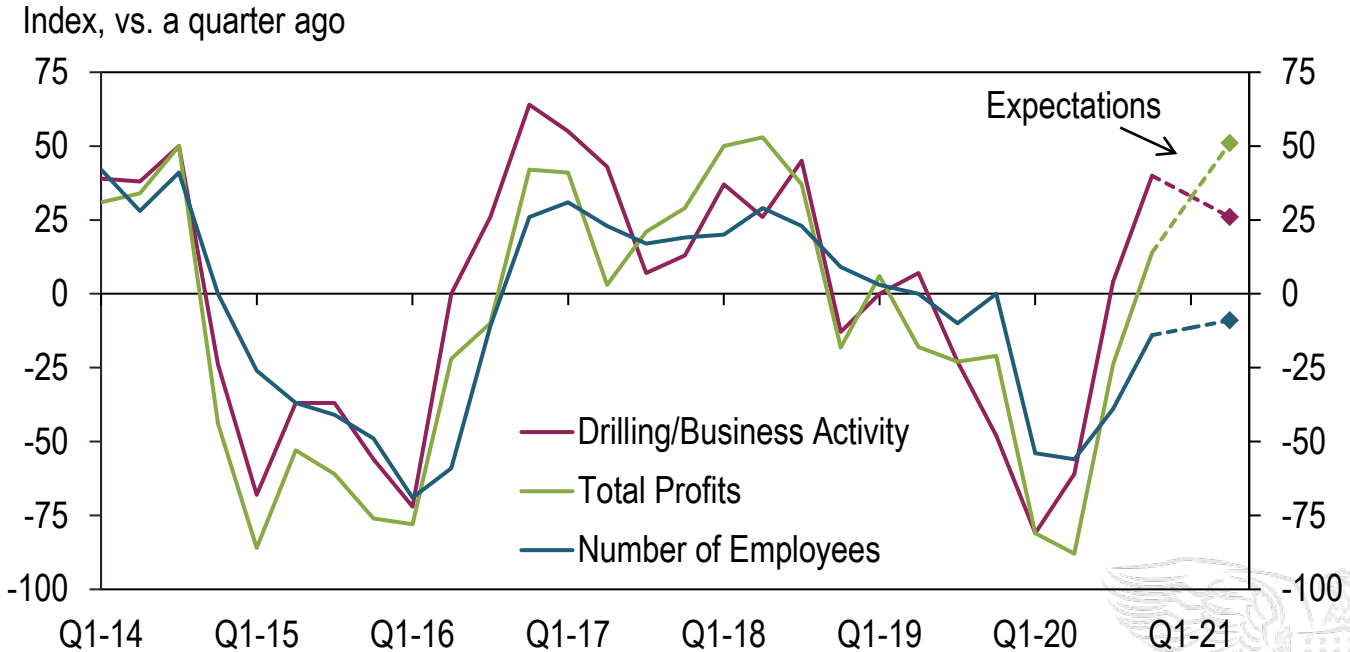
# Since 2017, mining employment has dropped across the U.S., region, and most District states, but production's up

## Mining Changes Jan. 2017- Jan. 2021



# More recently, COVID hurt oil and gas activity in the region, but firms have become more optimistic about 2021

FRBKC Energy Survey Indexes



# Renewable Energy in the Tenth District



# Some Tenth District states already rank among the top producers of renewable energy

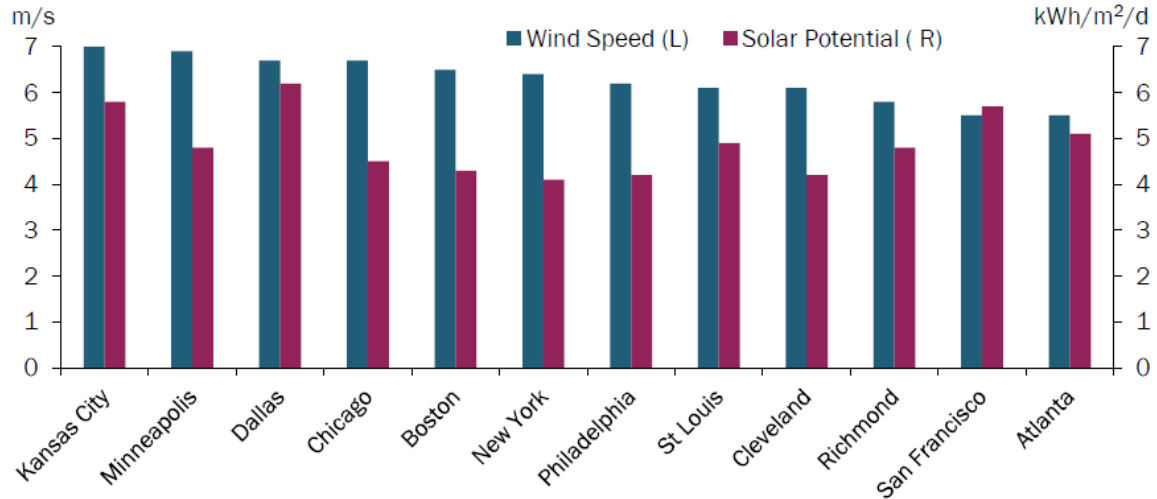
## Top Renewable Energy Producing States

2018 Rank	Biofuels	Solar/Wind/Water
1	Iowa	California
2	<b>Nebraska</b>	Washington
3	Illinois	Texas
4	Minnesota	Oregon
5	Indiana	New York
6	South Dakota	<b>Oklahoma</b>
7	Ohio	Iowa
8	Wisconsin	<b>Kansas</b>



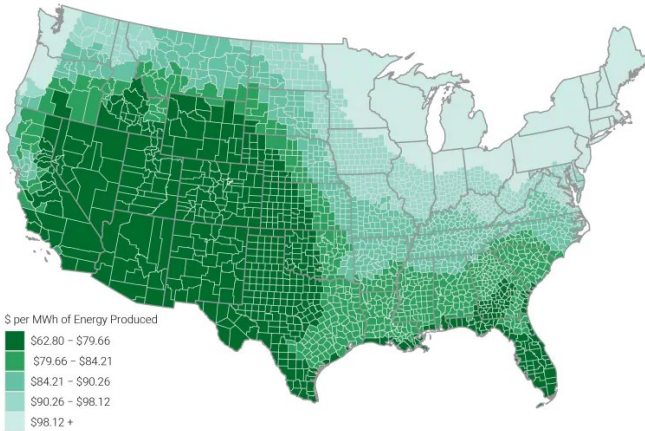
# The Tenth District has about the best overall potential for solar and wind of any Fed District

Renewable Resources in FRS Districts

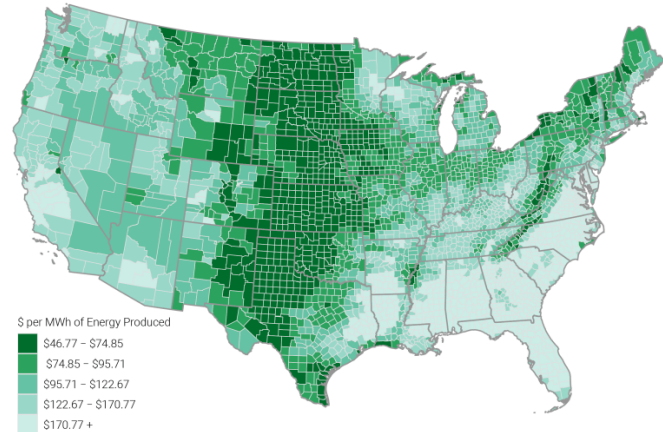


# So it could pay off for us to be so hot and windy!

## Utility-scale Solar PV Levelized cost of energy by county

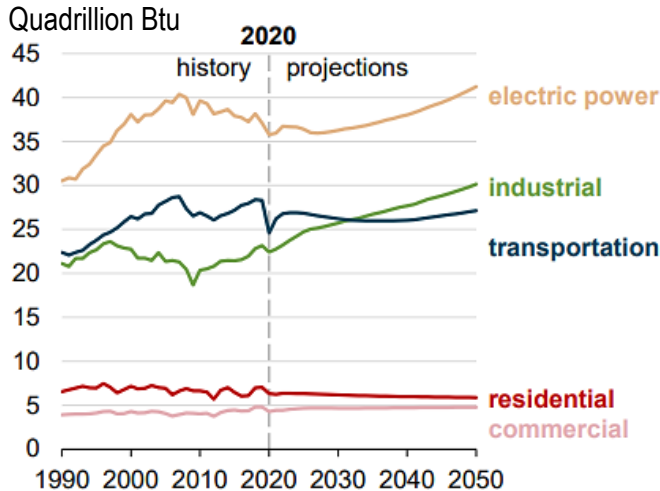


## Wind Potential Levelized cost of energy by county

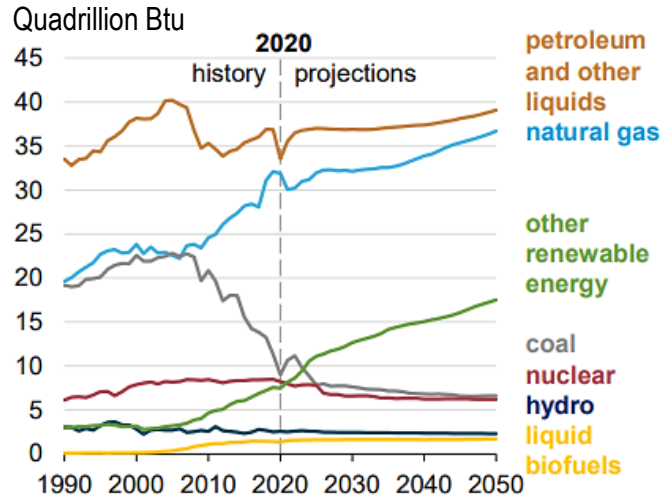


# But growth in the renewable sector may not be as fast as the decline in fossil fuels, especially in terms of jobs

## U.S. Energy Consumption by Sector



## U.S. Energy Consumption by Fuel



# Summary

- U.S. energy consumption has grown in recent years. Fossil fuel production and specifically oil and gas has been a large industry and key employer across the Tenth District
- However, COVID-19 and fluctuating commodity prices have changed the outlook for the industry and accelerated trends for greater renewable energy production
- While the energy landscape has continued to evolve in recent years, it remains an important part of the Tenth District economy





# Additional Resources:

- Annual [Energy Conference](#) of Dallas and KC Feds
- Kansas City Fed [Energy & Economy](#) Webpage
- Quarterly Energy [Survey](#)
- Quarterly Energy [Databook](#)
- Quarterly [\*Oklahoma Economist\*](#)

