Appendix I: Methodology

Strategic investments are defined as investments in the sectors prioritized under the Biden administration's industrial strategy: clean technology, semiconductors and electronics, biomanufacturing, and heavy industry. This report draws on two sources: the Clean Investment Monitor for clean technology investments, and the White House's Investing in America inventory for microelectronics and advanced manufacturing. The Clean Investment Monitor tracks both announced and actual clean economy investments, while the Investing in America inventory has data on announced investments for semiconductors and electronics, biomanufacturing, and heavy industry. This analysis excludes most statewide and multi-state investments (such as investments in large power grids, solar panel farms, and transmission lines), and most projects identified as "Energy and Industry" investments in the Clean Investment Monitor (other than non-biofuel investments in carbon management, hydrogen, and sustainable aviation fuels). While these are critical investments for the transition toward clean, renewable energy, they are not expected to have the same transformative impact on local economic development and employment growth as other investments tracked by the White House and the Clean Investment Monitor.

Employment distress, as defined in the Recompete Pilot Program statute, is when a place's prime-age employment (25 to 54 years old) significantly trails the national average. This report uses the Recompete program's county-level definition[i] for employment distress, where a county has both a PAEG of at least 5% and median household income is no higher than $75,000. PAEG is determined based on the prime-age employment rate, which is the percentage of the 25- to 54-year-old population that is currently working. By statute, PAEG is the difference (expressed as a percentage) between: 1) the national five-year average prime-age employment rate; and 2) the five-year average prime-age employment rate of the eligible area. This report uses 2022 data from the Census Bureau's Five-Year American Community Survey (ACS) and Small Area Income and Poverty Estimates (SAIPE) Program to calculate county-level prime-age employment gaps. Most counties defined as "employment-distressed" in this paper have fit this criteria consistently since 2007 (the earliest year of analytic comparisons in this paper).

For calculations with non-residential private fixed investment (PFI), we look at 2021-2022 strategic sector investments against 2021-2022 non-residential PFI data. We use 2007 as our first year of non-residential PFI county-level data, as that is the first year in which such data is available.

Estimates for non-residential PFI were derived from annual 2007-2022 data, allowing us to compare this data on a time-trend and compare distressed communities' experiences from the beginning of the Great Recession across two business cycles and two economic recovery periods (2010-2020 and 2021-present). For analyses of non-residential PFI data, we compare 2021-2022 non-residential PFI against 2021-2022 strategic sector investments.

To estimate annual non-residential PFI at the county level, we constructed a data matrix composed of:

1) County-level estimates of private sector gross regional product, segmented by industry sector, provided by Lightcast. For more information about Lightcast's model for sector-level subnational output estimates, see their methodology.

2) National detailed estimates for private nonresidential fixed assets by detailed industry and asset type, provided by the U.S. Bureau of Economic Analysis (BEA).

    a) Note: These detailed estimates rely on judgmental trends, trends in aggregated data, and other source data. These estimates are omitted from the BEA's standard fixed asset tables and are considered less reliable than the aggregated datasets they are included in. Users should interpret these estimates with caution.

3) Chain-type personal consumption expenditures prices indices for gross domestic product and gross nonresidential private domestic investment in structures, equipment, and intellectual property products, provided by the BEA.

All estimates for private sector gross regional product and private nonresidential fixed assets were adjusted to 2022 inflation-adjusted dollars using their relevant personal consumption expenditure price indices.

We then calculated log-normalized county-level private GRP location quotients for each industry sector. Alternatively, for each data year:

$$lqgrp_j^r = ln\left(\frac{grp_j^r \div \sum grp_j^r}{grp_j^{us} \div \sum grp_j^{us}}\right),$$

where $\boldsymbol{j}$ represents each two-digit industry sector, $\boldsymbol{r}$ represents each county, and $\boldsymbol{us}$ represents national values. Then, for each industry sector, year, and fixed asset type (structures, equipment, and intellectual property products), we calculated the ratio of national private nonresidential fixed assets and national private GDP:

$$ratio_{f \cdot j}^{us} = \frac{pnfa_{f \cdot j}^{us}}{gdp_j^{us}},$$

where $\boldsymbol{j}$ represents each two-digit industry sector, $\boldsymbol{f}$ represents each fixed asset type, and $\boldsymbol{us}$ represents total national values. Preliminary estimates of county-level private nonresidential fixed assets for each two-digit industry sector and asset type were then generated using the product of county-level private GRP in each sector, the national ratio of private nonresidential fixed assets and GDP, and the log-normalized private GDP location quotient by industry sector in each county (scaled between zero and 1). Alternatively, for each data year:

$$prelim\_pnfa_{f \cdot j}^r = \frac{lqgrp_j^r - \min(lqgrp)}{\max(lqgrp) - \min(lqgrp)} \cdot ratio_{f \cdot j}^{us} \cdot grp_j^r,$$

where $\boldsymbol{j}$ represents each two-digit industry sector, $\boldsymbol{f}$ represents each fixed asset type, $\boldsymbol{r}$ represents each county, and $\boldsymbol{us}$ represents national values.

For each two-digit industry sector and fixed asset type, we then summed all county-level data and took the ratio of that summed total to the known national value of private nonresidential fixed assets for that industry and fixed asset type. These normalization quotients were then multiplied by each county's preliminary private nonresidential fixed asset estimates to obtain final county-level estimates for private nonresidential fixed assets, by two-digit industry sector and fixed asset type. Alternatively, for each data year:

$$pnfa^{r}_{f \cdot j} = \left(\frac{\sum prelim\_pnfa^{r}_{f \cdot j}}{pnfa^{us}_{f \cdot j}} \right) \cdot prelim\_pnfa^{r}_{f \cdot j},$$

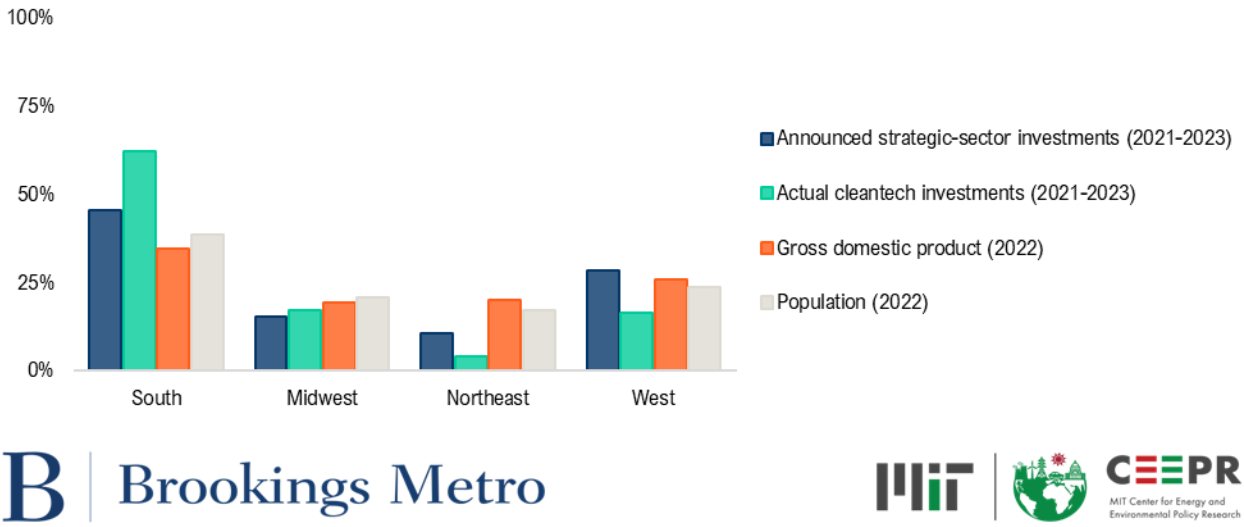
where ***j*** represents each two-digit industry sector, ***f*** represents each fixed asset type, ***r*** represents each county, and ***us*** represents national values.

Appendix II: Additional analysis on strategic sector investments

This appendix provides a more thorough analysis of additional characteristics about the counties receiving strategic investments.

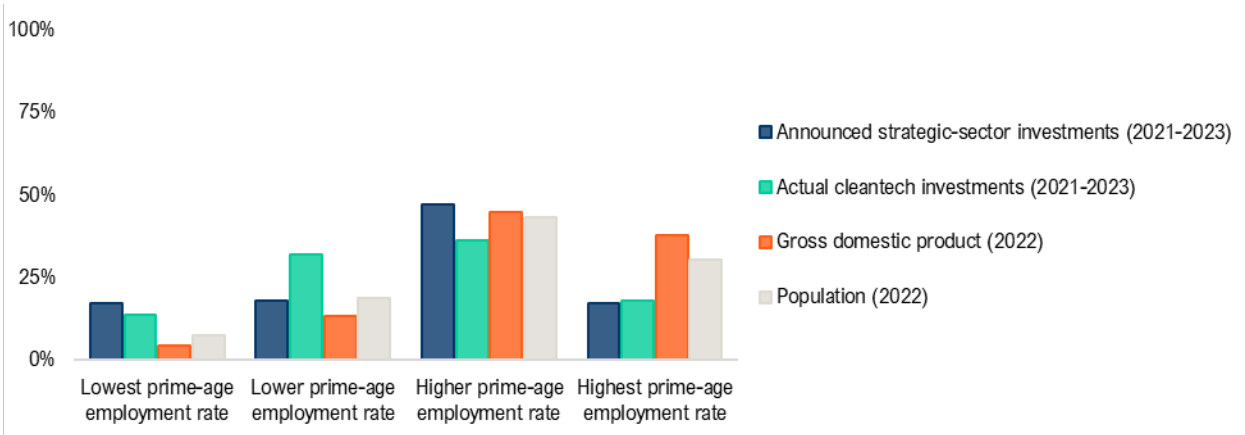
For the purposes of this report, strategic sector investment (SSI) refers to announced investments in clean technology, semiconductors and electronics, biomanufacturing, and other advanced industries, as tracked by two sources: 1) the Clean Investment Monitor for clean technology investment; and 2) the White House's Investing in America inventory for microelectronics and advanced manufacturing investments. These sources track two stages of investment. "Announced" investments are estimates of a project's total value as provided by the project developer, usually at the time of the project's announcement. "Actual" investments are estimates of the real-time expenditures that occur as a facility is constructed. Actual investment data is only available for clean technology investments in the Clean Investment Monitor. While announced investment indicates intent and longer-term impacts, actual investment demonstrates real-time economic impacts.

- **Geography:** The South received a relatively higher share of SSI than any other region. Southern states house 39% of the nation's population and generate 35% of its GDP, but account for 46% of announced SSI. Clean technology is particularly concentrated in the South, representing two-thirds (65%) of SSI announcements in the region, as compared to 48% nationally.



Source: Brookings Metro and MIT CEEPR analysis of Clean Investment Monitor, White House Investing in America database, Bureau of Economic Analysis, and U.S. Census Bureau data.

› **Prime-age employment rate:** Counties in the lowest prime-age employment bracket are receiving four times the share of strategic investments than their share of GDP, and 3.1 times their share of GDP for actual clean-tech investments.

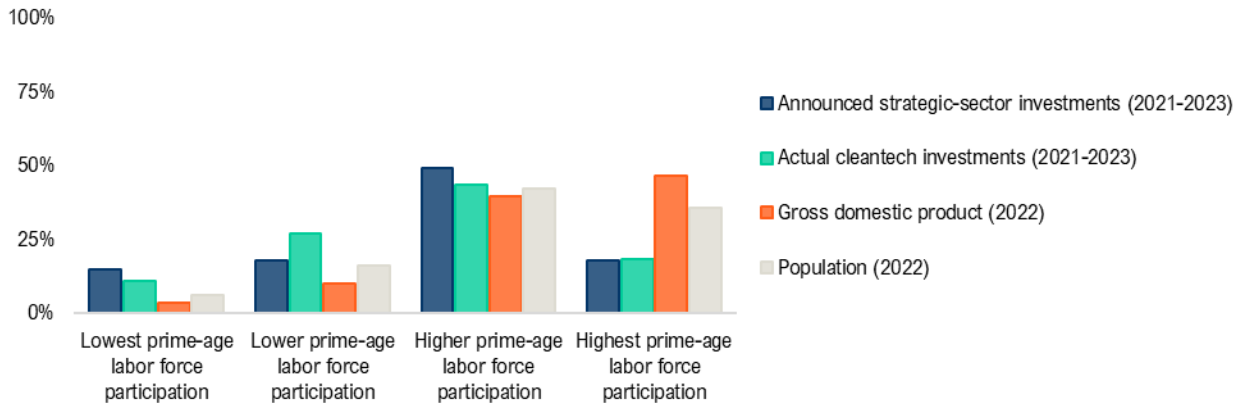


Brookings Metro

MIT CEEPR MIT Center for Energy and Environmental Policy Research

Source: Brookings Metro and MIT CEEPR analysis of Clean Investment Monitor, White House Investing in America database, Bureau of Economic Analysis, and U.S. Census Bureau data.

› **Labor force participation:** Counties with the lowest labor force participation rates are receiving 4.5 times the share of SSI than their share of GDP, and more than triple their share of GDP for actual clean-tech investments.

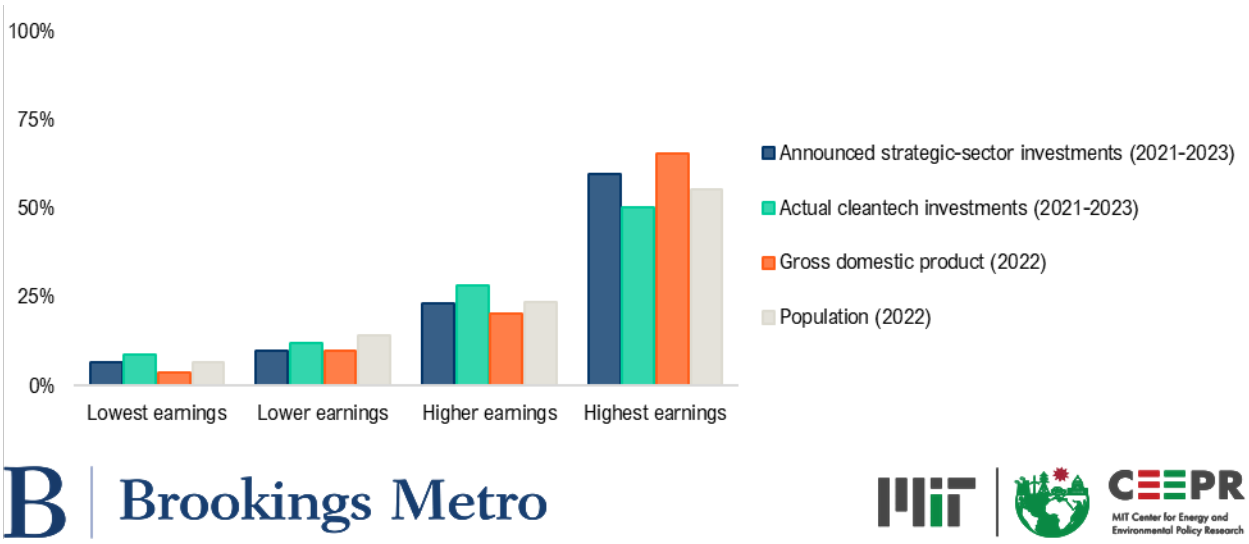


Brookings Metro

MIT CEEPR MIT Center for Energy and Environmental Policy Research

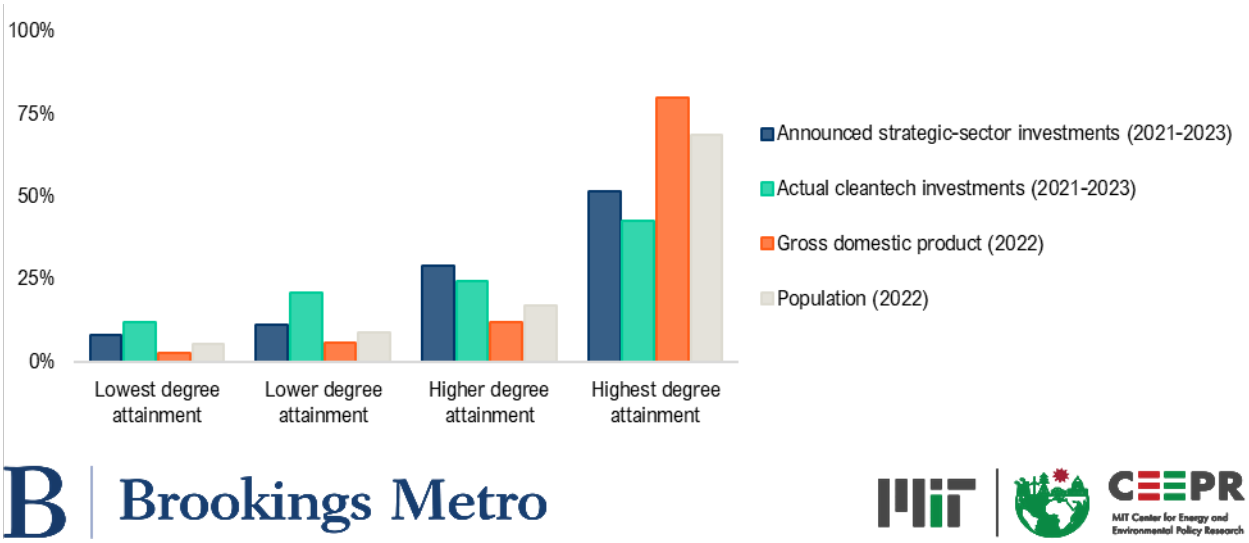
Source: Brookings Metro and MIT CEEPR analysis of Clean Investment Monitor, White House Investing in America database, Bureau of Economic Analysis, and U.S. Census Bureau data.

› **Median earnings:** Counties in the lowest median earnings bracket are receiving 1.8 times the share of SSI than their share of GDP, and 2.4 times their share of GDP for actual clean-tech investments.



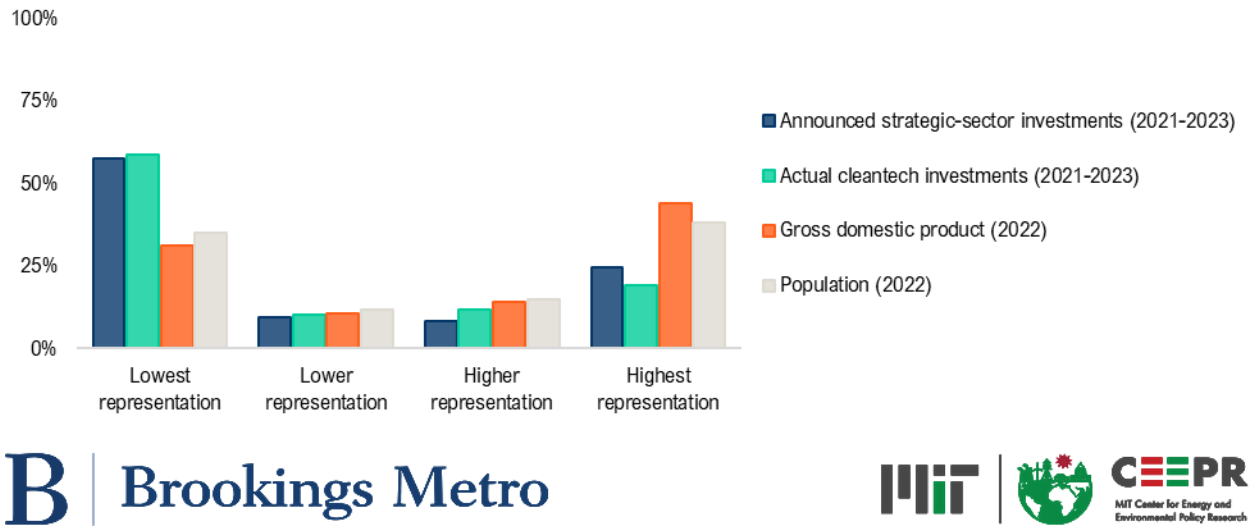
Source: Brookings Metro and MIT CEEPR analysis of Clean Investment Monitor, White House Investing in America database, Bureau of Economic Analysis, and U.S. Census Bureau data.

- **Educational attainment:** Counties with the lowest share of workers holding a bachelor's degree or higher are receiving triple the share of announced SSI and 4.3 times the share of actual clean-tech investments compared to their share of GDP.



Source: Brookings Metro and MIT CEEPR analysis of Clean Investment Monitor, White House Investing in America database, Bureau of Economic Analysis, and U.S. Census Bureau data.

- **State-level union representation:** Around one-quarter of all investments are flowing to states with the highest union representation (25% of announced SSI), while one-fifth of clean-tech investments in these states has been spent.



Source: Brookings Metro and MIT CEEPR analysis of Clean Investment Monitor, White House Investing in America database, Bureau of Economic Analysis, and U.S. Census Bureau data.

GLOSSARY

ADVANCED INDUSTRIES are industries in which R&D spending exceeds $450 per worker, and where at least 21% of all workers are employed in occupations requiring a high degree of STEM knowledge. For more information, see previous Brookings research about America's advanced industries and why they matter for regional economic growth and prosperity.

AMERICAN RESCUE PLAN ACT is the $1.9 trillion economic stimulus and pandemic recovery legislation passed by the 117th Congress and signed into law in March 2021.

ANNOUNCED INVESTMENTS are estimates of a strategic sector investment's total value, as provided by the project developer.

CHIPS AND SCIENCE ACT is the $280 billion manufacturing incentives legislation passed by the 117th Congress and signed into law in August 2022.

CLEAN TECHNOLOGIES are investments in zero-emission vehicles, clean energy, building electrification, and carbon management technology. For more information, see the Clean Investment Monitor.

RECOMPETE PILOT PROGRAM is a place-based program authorized by the CHIPS and Science Act that seeks to alleviate persistent economic distress in communities with high prime-age employment gaps and low income levels. For more information, see the Economic Development Administration's Notice of Funding Opportunity (NOFO).

EMPLOYMENT-DISTRESSED COUNTIES are counties with a prime-age employment gap at least five points or higher than the national average, and a median household income of no more than $75,000. This report uses 2022 data from the Census Bureau's Five-Year American Community Survey (ACS) and Small Area Income and Poverty Estimates (SAIPE) Program to calculate county-level prime-age employment gaps.

FIXED ASSETS are tangible goods and properties purchased by private sector firms for use in commercial manufacturing and production. This report focuses explicitly on nonresidential fixed assets, including structures, equipment, and intellectual property products. For more information, see the BEA's glossary.

GROSS DOMESTIC PRODUCT (GDP) is the value of final goods and services produced in the U.S. each year. This measure of economic output is also referred to as "gross regional product" in subnational geographies (e.g., counties and metropolitan areas). For more information, see the BEA's glossary.

INFLATION REDUCTION ACT is the $433 billion deficit reduction and climate legislation passed by the 117th Congress and signed into law in August 2022.

INFRASTRUCTRE INVESTMENT AND JOBS ACT is the $1.2 trillion infrastructure and economic resiliency legislation passed by the 117th Congress and signed into law in November 2021. This legislation is also frequently referred to as the Bipartisan Infrastructure Law.

METROPOLITAN/MICROPOLITAN AREAS are regions (core-based statistical areas) defined by the Office of Management and Budget based on the labor market ties and population density of the region's constituent counties. Regions that have at least one urban area with a population of 50,000 or higher are defined as "metropolitan statistical areas," while regions that have at least one urban area with a population between 10,000 and 50,000 are defined as "micropolitan statistical areas."

PLACE-BASED INDUSTRIAL STRATEGIES are economic development strategies that: 1) encourage economic transformation through interventions in particular industries; and 2) seek to better leverage concentrations of talent, suppliers, and knowledge that cluster and interact in places to spur development. For more information, see previous Brookings research analyzing the federal government's new modern industrial strategy.

PRIME-AGE EMPLOYMENT GAP (PAEG) is the difference between the national prime-age employment rate and a region's prime-age employment rate. This report uses 2022 data from the Census Bureau's Five-Year American Community Survey (ACS) to calculate county-level prime-age employment gaps.

PRIME-AGE EMPLOYMENT RATE (PAER) is the share of a region's 25- to 54-year-old population that is currently employed. This report uses 2022 data from the Census Bureau's Five-Year American Community Survey (ACS) to calculate county-level prime-age employment rates.

PRIVATE FIXED INVESTMENT (PFI) includes annual spending by private businesses and nonprofit institutions on equipment, structures, and intellectual property products. This report focuses exclusively on nonresidential private fixed investment. For more information, see the BEA's glossary.

STRATEGIC SECTOR INVESTMENTS are announced investments by private firms and manufacturers in the sectors prioritized under the Biden-Harris administration's industrial strategy: clean technology, semiconductors and electronics, biomanufacturing, heavy industry, and other advanced sectors. This report draws upon the Clean Investment Monitor for clean technology investments and the White House's Investing in America database for other strategic sector investments.

STRUCTURES include newly constructed facilities, commercial properties, and other supportive infrastructure (such as wells and plumbing/electrical systems) used by nonprofit institutions and private sector firms, or the improvement and/or purchase of existing such structures. This report focuses explicitly on nonresidential structures. For more information, see the BEA's glossary.

URBANICITY is a measure of how urban or rural a given geography is. In this report, counties are defined as "urban" if they were part of a metro area defined by the Office of Management and Budget's (OMB) March 2020 delineations and were either: 1) defined as "large central counties" in the National Center for Health Statistics' (NCHS) 2013 Urban-Rural Classification Scheme; or 2) contained one or more of their metro area's principal cities. Counties are defined as "suburban" if they were part of a metro area defined by the OMB's 2020 delineations and were either: 1) defined as "large fringe

counties" in the NCHS Urban-Rural Classification Scheme; or 2) did not contain any of their metro area's principal cities (as long as they did not otherwise qualify as an "urban" county). Counties included in a 2020 micropolitan area are defined as "micropolitan," and counties that were not included in either a 2020 metropolitan or micropolitan area are defined as "rural." For more information, see the OMB's March 2020 delineation files and the NCHS 2013 classification scheme for counties.

[i] See Endnote 2 in the report. Recompete uses this criteria only for counties that: 1) do not cover the entire area of their local labor market; and 2) exist within a local labor market with a PAEG below 2.5%. Counties with five or more contiguous census tracts that each have a PAEG above 5% and a median household income below $75,000 may also be eligible for Recompete funding even if the county itself does not meet these thresholds, as long as the organization applying for funding is located within these census tracts.