



First-of-its-kind national study identifies county-by-county opportunities in all 50 states that, if fully implemented, could result in the removal of 1 billion metric tonnes of  $CO_2$  and 440,000 new jobs.

## Key Findings

Indiana can remove  $CO_2$  from the air by increasing carbon stored in cropland soils and converting agricultural residues to useful products. Cropland management will also reduce soil erosion.

## Near Term Opportunities

- $\bullet$  Indiana has some of the highest potential for soil  $\rm CO_2$  removal in the USA
- Large areas of croplands can use cover crops for economically affordable CO<sub>2</sub> removal

## Longer Term Investments

• Indiana has a high density of biomass (e.g. corn stover) which could be used for biomass carbon removal and storage (BiCRS), co-located with favorable geologic storage sites

## **INDIANA** OPPORTUNITIES



- Planting cover crops & perennial field borders can supply soil-based CO<sub>2</sub> removal (particularly in Allen, Boone, and Daviess counties)
- Marginal land (not currently used for crops) can be used for native grasses, perennial carbon crops, and forests
- Excellent co-location opportunities for agriculture, carbon-crop biomass processing & geologic storage

# BY THE NUMBERS – CO<sub>2</sub> Removal Capacity in Indiana

Forest Management

Indiana has **2.6M** acres of land potentially suitable for reforesting; this could capture an estimated

**9.2** million tonnes CO<sub>2</sub>e per year

#### Cropland Soil Management

**5.4M** tonnes CO<sub>2</sub> removed by 2050

< \$40/tonne CO2

**4M** tonnes CO<sub>2</sub>e by 2050 total climate benefit (avoided + removed) Biomass Carbon Removal and Storage Environmental, Equity and Energy Justice

**23M** tonnes of  $CO_2$  removed (via gasification to  $H_2$ )

\$70.9/tonne CO2

**14M** dry tonnes of biomass

Indiana and its neighbors are in the **top 3%** of states that would **benefit from soil CO<sub>2</sub> removal**, by reducing soil erosion and water pollution.

### Direct Air Capture and BiCRS

facilities can help regain quality jobs lost from the coal industry <sup>[1]</sup>

<sup>(1)</sup> A 500-kilotonne DACS facility can generate 220 long-term jobs; for every \$1 million of BiCRS investment, ~7 new, long-term jobs are created.

By implementing methods that remove CO<sub>2</sub> from the air, communities big and small can create new jobs, improve air and water quality, increase our resilience to a changing climate, and protect life and property.

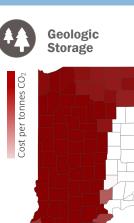
i

# ROADS to **REMOVAL**

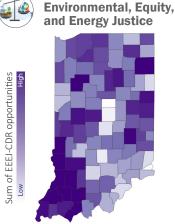


## **COUNTY-LEVEL** RESULTS







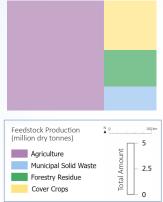


CO<sub>2</sub> removal potential weighted by indices of Social Vulnerability and Environmental, Equity, and Energy Justice

- Planting cover crops, perennial field borders, and carbon crops can improve soil stability and decrease water- and wind-borne erosion in the Ohio River Basin and along the Wabash River
- Basal sandstones of the Mount Simon Formation in Western Indiana are a favorable location for geologic CO<sub>2</sub> storage
- Regions with abandoned oil wells may offer opportunities for geologic CO<sub>2</sub> sequestration but will need to address environmental risks to people & wildlife



#### % OF BIOMASS AVAILABLE



#### **Roads to Removal Partners:**

Lawrence Livermore National Laboratory • Oak Ridge National Laboratory • Lawrence Berkeley National Laboratory • University of Texas at Austin • North Carolina State University • University of California, Berkeley • Colorado State University • Indiana University Indianapolis • Yale University • University of New Hampshire • Iowa State University • Michigan State University • University of Pennsylvania

## EVERY REGION HAS A STORY. EVERY REGION HAS AN OPPORTUNITY.





ii