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INVEST WITH PURPOSE

Cap & Invest:

Rural Economic Development Opportunities

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Cap and Trade Basics

To emit carbon, you must have a permit. Permits can be:

- **Allowances** – permits issued by the state
- **Offsets** – new emission reductions from unregulated sectors



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Presentation Outline

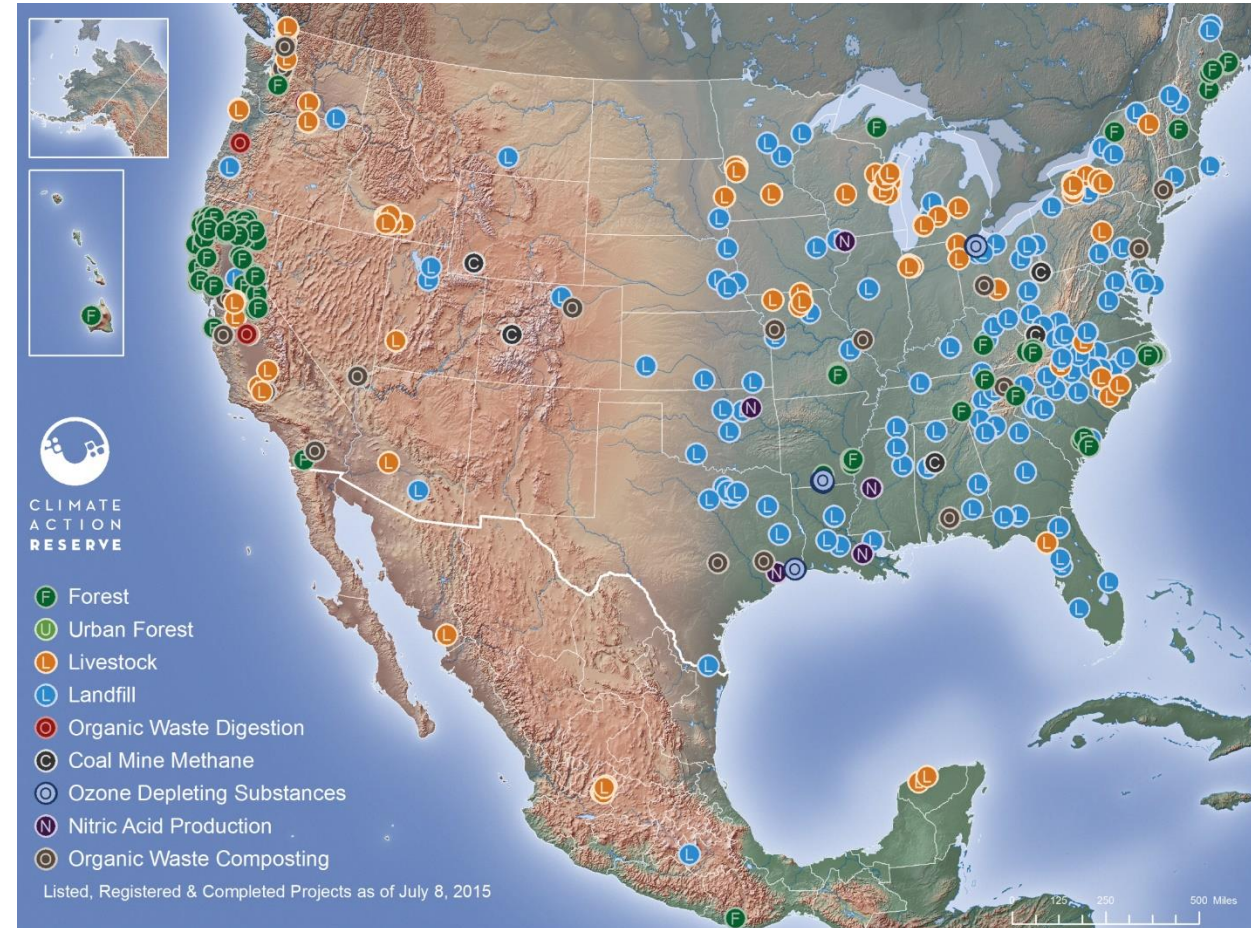
1. Offset project economic development opportunities
2. Allowance revenue economic development opportunities



Offset project economic development opportunities

Offset Basics

- In a cap-and-trade systems, sectors that are not covered by the regulation can contribute greenhouse gas reductions.
- Uncapped sectors:
 - Forestry (improved forest management, avoided conversion, reforestation)
 - Agriculture
- Benefits:
 - Economic development opportunity for low-carbon innovations in rural places
 - Cost-containment



Environmental integrity of offsets



- Protocol defines
 - what projects *qualify* to generate offsets, and
 - how to *quantify* the offsets
- Protocol ensures reductions are real, permanent, quantifiable, verifiable, enforceable, and additional
- Annual process to generate cash flows for emission reductions:



The Climate Trust History



- Primary programs
 - **Oregon Program** – Retire offsets on behalf of Oregon utilities
 - **Northwest Natural Smart Energy** – Retire livestock digester offsets from the Pacific Northwest on behalf of NW Natural Customers
 - **Climate Trust Capital** – Invest early-stage, equity-like finance in forestry, anaerobic digester and grassland conservation projects in return for shared ownership of the resulting carbon offsets.

Key Metrics Dashboard

3.6 MILLION
Total tons greenhouse gas reduced

\$34 MILLION
Total committed to projects

5.7 MILLION
Contracted emissions reductions (tons)

53
Total projects









\$5.5 MILLION
Fund I dollars to deploy

\$5.5 MILLION +
Second anticipated deployment



TCT Portfolio

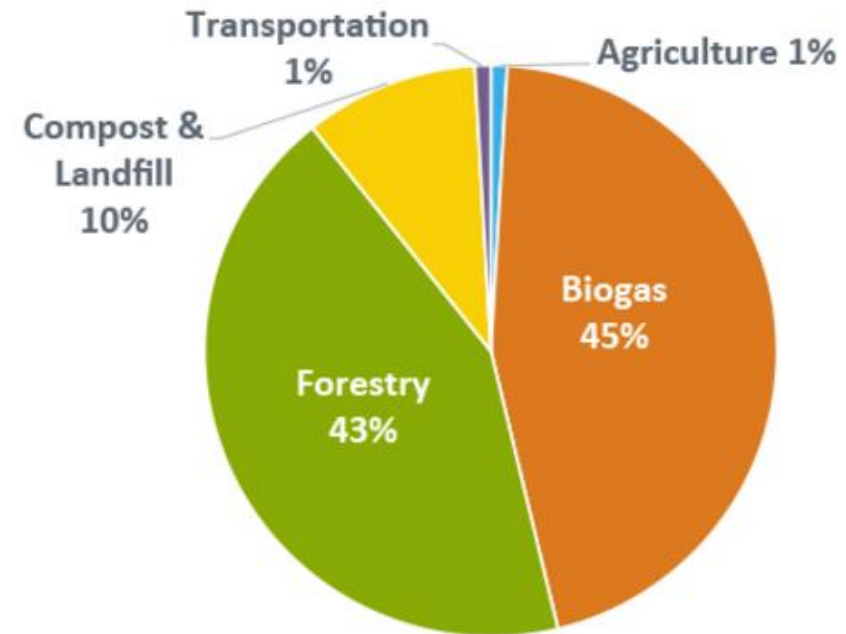


- Biogas 
- Agriculture 
- Compost & Landfill 
- Forestry 
- Renewable Energy 
- Energy Efficiency 
- Transportation 
- Material Substitution 

The Climate Trust Forestry and Agricultural Work to Date

- Offset projects occur in uncapped sectors → forestry and agricultural projects in rural communities.
- \$7.3 million invested in Clatsop, Tillamook, Lane, Morrow and Yamhill Counties
 - Forestry: \$2 million
 - Dairy Digesters: \$5.3 million

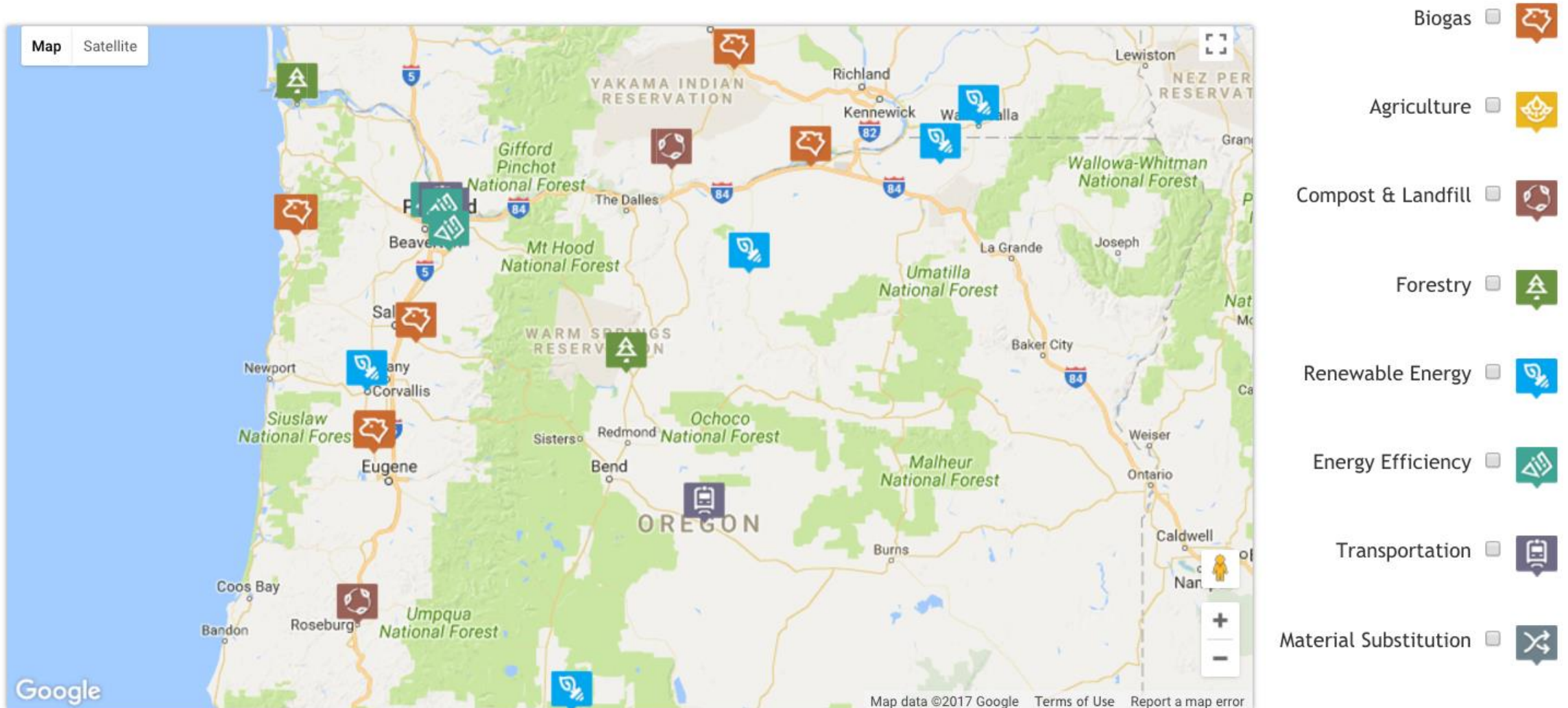
Offsets Contracted Since 2010



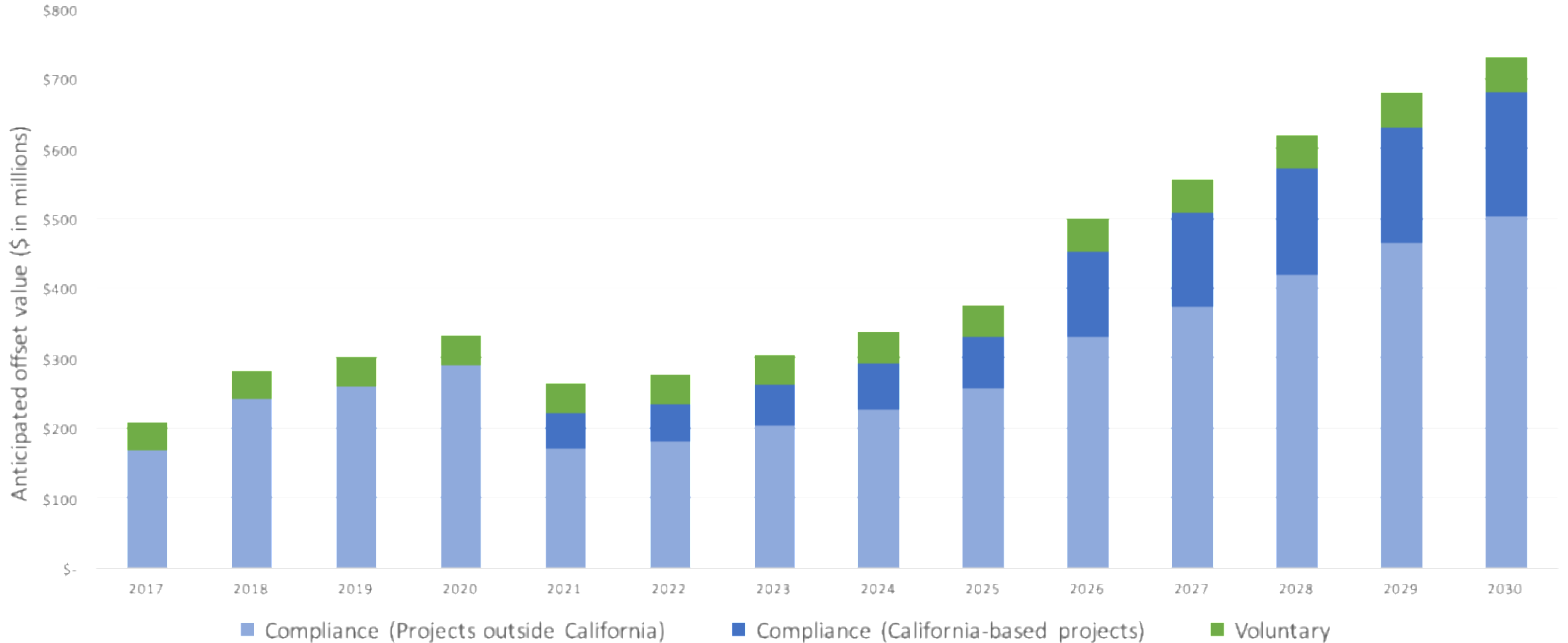
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Oregon Portfolio

55% of Oregon Standard funding has been spent on offset projects in Oregon.



North American Forecasted Demand for Voluntary and Compliance Offsets



Compliance Offset Market - \$5.1 billion in demand (\$1.1 billion for California projects)

Voluntary Offset Market - \$633.3 million in demand



No forestry project in Oregon has issued offset credits for compliance with California's market

"The national distribution of projects generally matches the distribution of private forest land in the US, with the notable exceptions of Oregon (no projects) and Washington State (one project). Sustainable forest management rules mandated by the offset program are stringent and may reduce the fraction of projects in regions with less stringent versions of such rules."

Anderson C.M., Field C.B., and Mach K.J. 2017. Forest offsets partner climate-change mitigation with conservation. *Front Ecol Environ*.

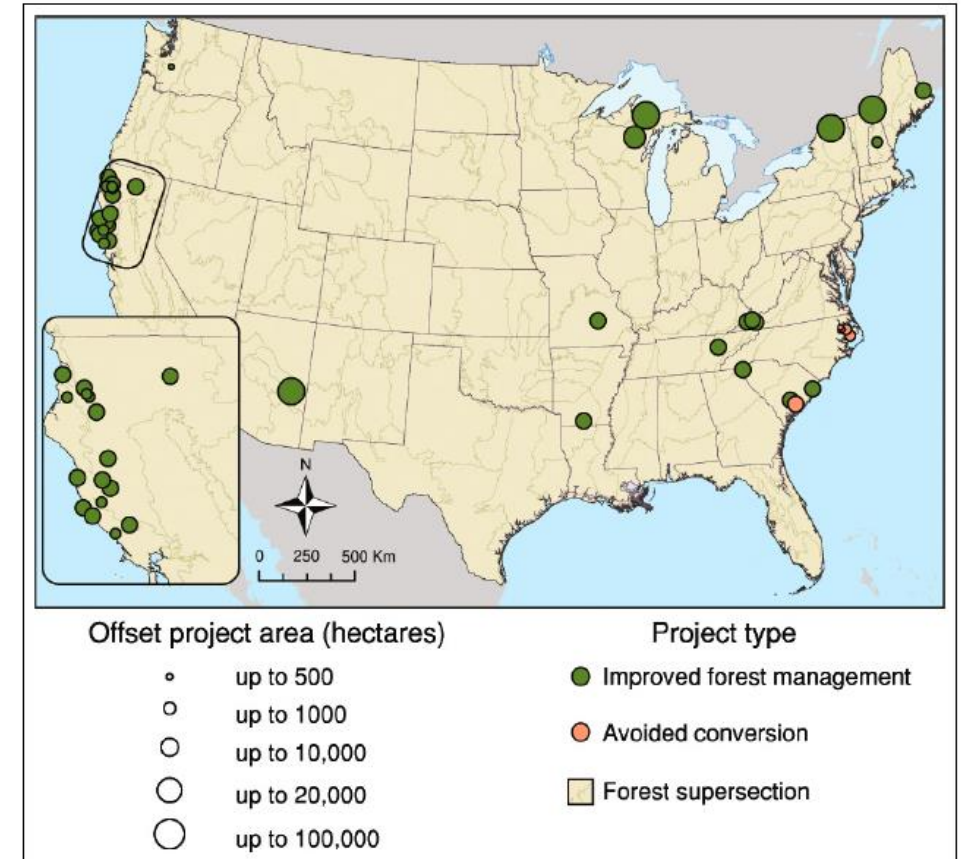


Figure 2. Forest offsets are sold in the California cap-and-trade market, but the forest projects themselves can be located anywhere in the contiguous US. There are currently 39 credited offset projects, accounting for more than 349,000 hectares of forest land in both improved forest management (green circles) and avoided conversion (peach-colored circles) projects. Background map depicts forest supersection, which is used for calculating baseline forest carbon. Circle size corresponds to project size.

North American Compliance and Voluntary Carbon Offset Market

California Air Resource Board Protocols:

1. Livestock digesters
2. Forestry
3. Ozone depleting substances
4. Coal mine methane capture
5. Rice cultivation

Climate Action Reserve Protocols:

1. Grassland conservation
2. Nutrient/nitrogen management
3. Composting

Verified Carbon Standard Protocols:

1. Wetlands
2. Avoided deforestation of tropical forests

American Carbon Registry Protocols:

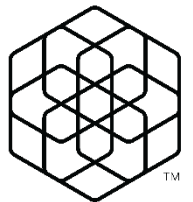
1. Forestry aggregation
2. Livestock management
3. Compost additions to grasslands
4. Carbon capture and storage

Compliance Market
\$5.1 billion demand through 2030

Voluntary Market
\$633 million demand through 2030

Climate Trust Capital

- Provide early-stage, equity-like financing for projects in return for shared ownership of the resulting carbon offsets.
- Invested in Nature Conservancy to purchase of a conservation easement on grazing land in Wallowa County.



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Allowance revenue economic development opportunities

Allowance Revenue Basics

- When emitters pay to pollute, the revenue can accrue to
 1. Emitters (allowances are “allocated” or given away for free)
 - Pro: Protects leakage prone industry.
 2. Citizens (allowances are sold and the revenue is returned to citizens)
 - Pro: Builds citizen support. Potentially combats regressive effects.
 3. Government reinvestment (allowances are sold and the revenue is reinvested in greenhouse gas mitigation)
 - Pro: Lowers long-term costs of meeting climate goals. Prepares Oregon to take part in the growth of the low-carbon economy.



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CALIFORNIA ALLOWANCE DISTRIBUTION OVER TIME

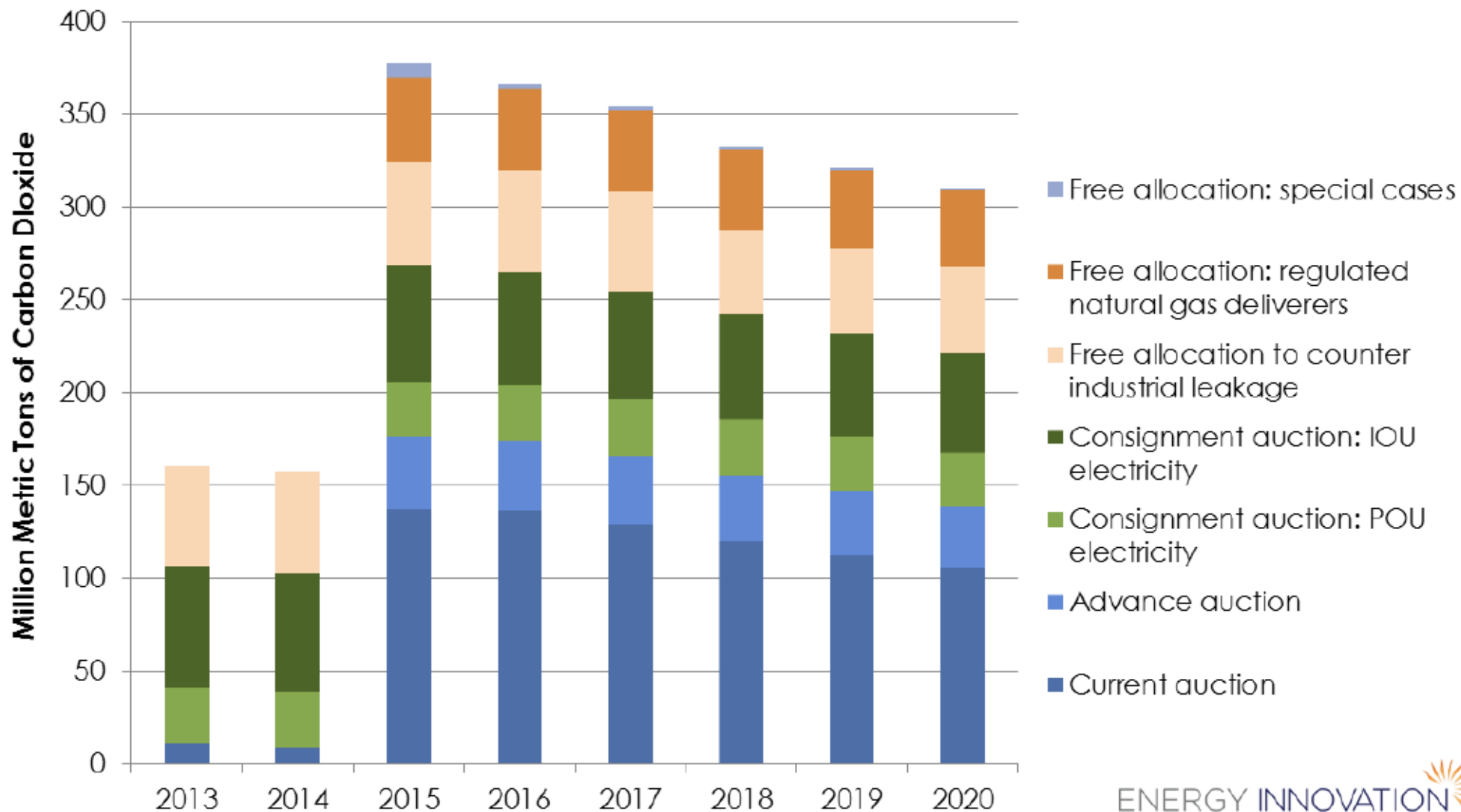
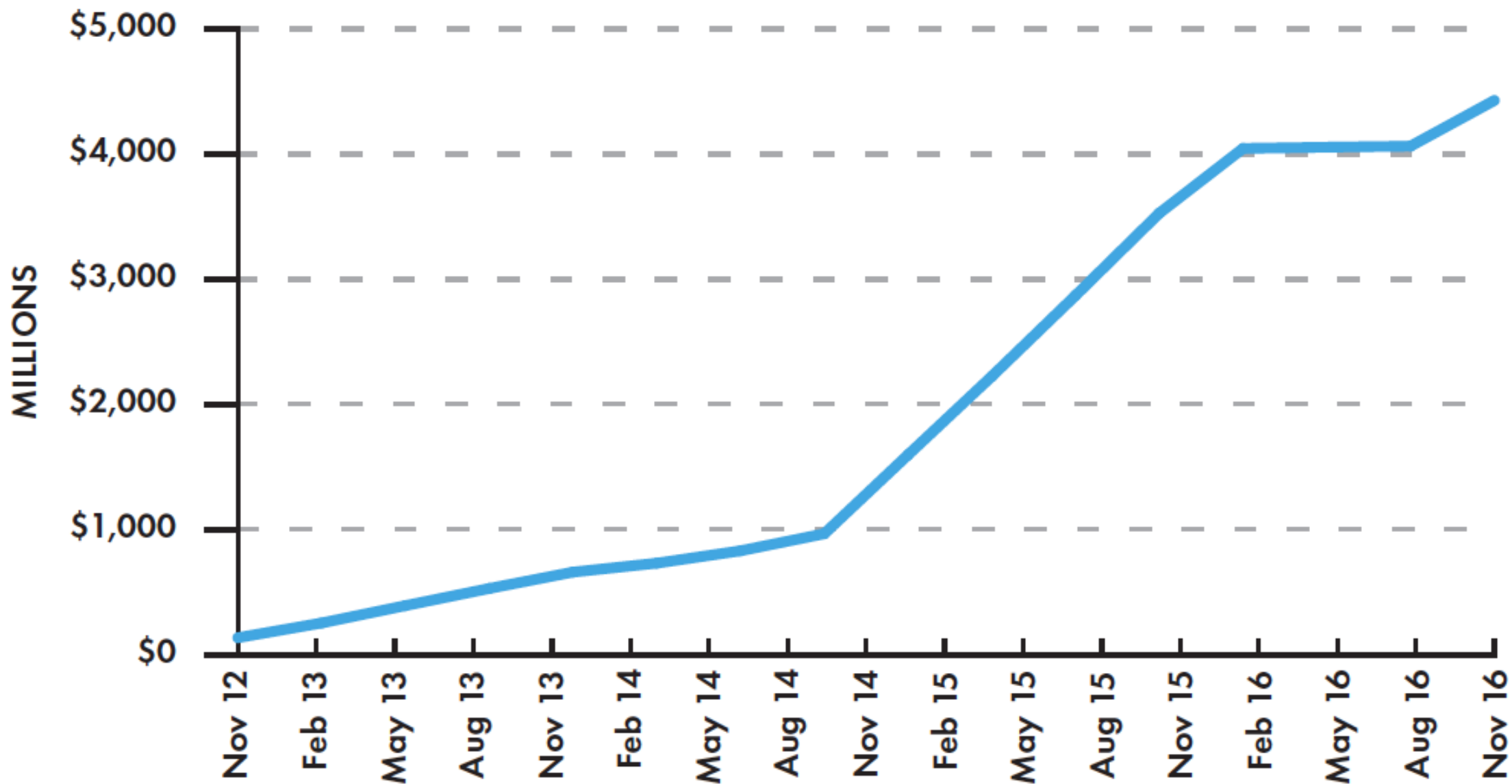


Figure 4. California allowance distribution over time. (Source: Energy Innovation graphic with data from CARB's State Auction Budget Spreadsheet.)¹⁴

Figure 3: Cumulative Proceeds from the Sale of State-Owned Allowances Deposited in the GGRF (as of December 31, 2016)



Government reinvestment specifics in California

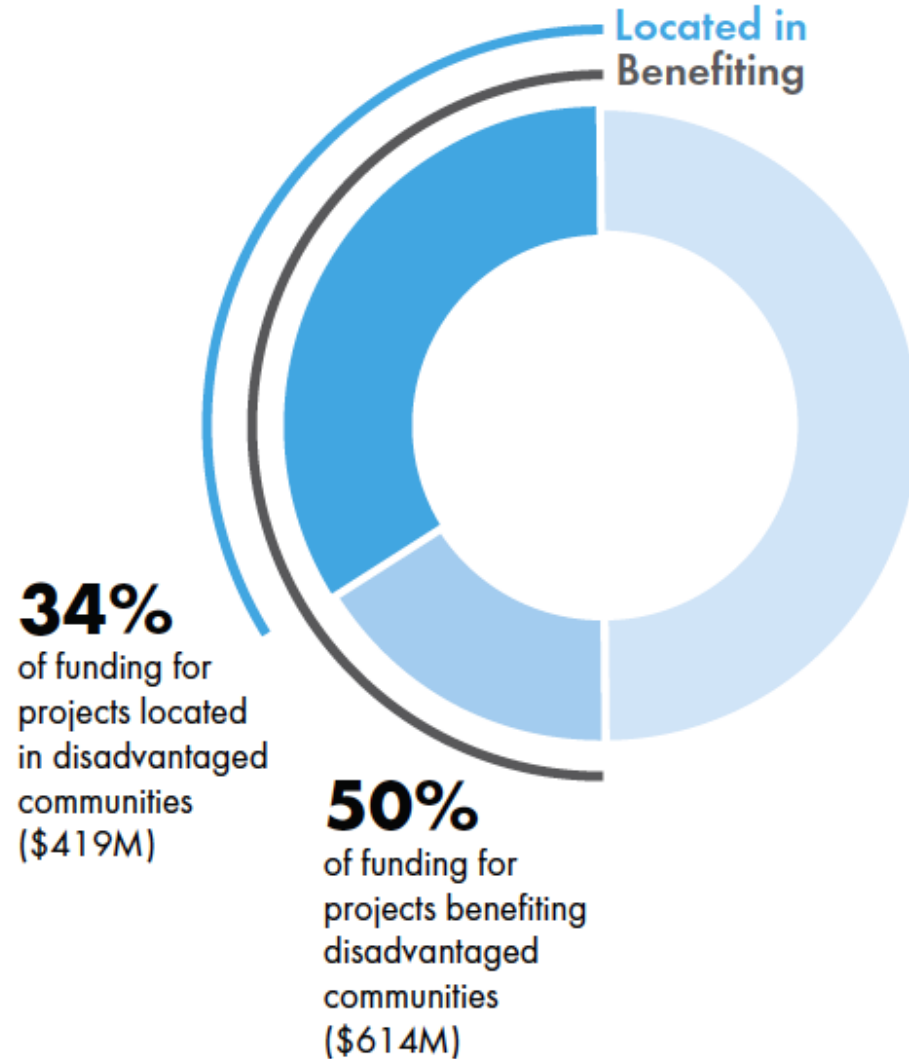
- **California Senate Bill 706** – Auction proceeds must be spent to facilitate the reduction of greenhouse gas emissions in California.
- **California Senate Bill 535** –
 - 10% of the revenues derived from auctioning allowances must be spent directly in disadvantaged communities;
 - 25% of these revenues must be spent in a way that provides benefits to these communities.



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Figure ES-4: Cumulative Investments Benefiting Disadvantaged Communities

\$1.2B in Cumulative Implemented Funds*



* Total amounts do not include benefits attributable to the High-Speed Rail Project

Source: California Climate Investments 2017 Annual Report

Potential revenue for low-carbon reinvestment: \$3.6 billion per year

- Renew Oregon estimates at least \$700 million per year in revenue to reinvest in greenhouse gas mitigation
 - (Key assumptions: prices at California floor, 50% of industry allowances are allocated, remaining allowances are auctioned.)
- Leverage
 - 5.16x leverage from additional public and private capital for each investment from the Greenhouse Gas Reduction Fund (California Climate Investments 2017 Report)
 - \$700 million → \$3.6 billion per year



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Opportunities for rural investment to develop the low carbon economy

Rural economic development opportunity	Climate benefit
Restoration and forest health treatment	Carbon sequestration. Maintain (through avoided fire) and enhance forest carbon storage
Integrated biomass resources	Carbon dioxide reduction. Reduce fossil fuel plant emissions
Long-term forest management	Carbon sequestration. Increase carbon sequestration
Soil carbon restoration (grassland restoration and management, no-till agriculture)	Carbon sequestration. Enhance soil carbon sequestration
Avoided conversion of grasslands into croplands	Carbon sequestration. Maintain soil carbon storage
Dairy manure management (solid separation, anaerobic digestion)	Methane reduction. Avoid methane emissions
Nutrient management (enhanced nitrogen management through precision agriculture)	Nitrous oxide reduction. Reduce nitrous oxide emissions

Land-based climate mitigation opportunities are large job creators.

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INDUSTRY	DIRECT	INDIRECT	INDUCED	TOTAL
Reforestation, Land and Watershed Restoration, and Sustainable Forest Management	17.55	12.95	9.2	39.7
Crop Agriculture	9.8	6.5	6.5	22.8
Livestock	6.4	9.1	6.2	21.7
Gas (heavy and civil construction for pipelines - 50% new and 50% repair)	12.05	3.93	5.912	21.888
Mass transit and freight rail construction	13	3.70	5.038	21.738
Roads and bridges: repair	11.1	3.69	5.527	20.317
Conservation (Parks and Land and Water Conservation Fund)	11.45	4.15	4.7	20.3
Water infrastructure	9.96	4.38	5.427	19.764
Aviation	9.7	4.30	5.264	19.266
School buildings	8.65	5.38	5.233	19.262
Building retrofits	7.7	4.70	4.96	17.36
Roads and bridges: new	8.7	3.94	4.834	14.474
Solar	5.4	4.40	3.92	13.72
Biomass	7.4	5.00	4.96	17.36
Smart grid	4.3	4.60	3.56	12.46
Wind	4.6	4.90	3.8	13.3
Electricity generation, transmission, distribution	5.32	4.50	4.696	14.512
Coal	1.9	3.00	1.96	6.86
Financial Industry	3.22	2.34	1.668	7.228
Oil and gas	0.8	2.90	1.48	5.18
Nuclear	1.2	1.80	1.2	4.2

Source: Heidi Garrett-Peltier and Robert Pollin, University of Massachusetts Political Economy and Research Institute.

Note: Multipliers derived using IMPLAN 2.0 with 2007 data. Infrastructure multipliers and assumptions are presented in "How Infrastructure Investments Support the U.S. Economy: Employment, Productivity and Growth," Political Economy Research Institute, January 2009, <http://www.peri.umass.edu/236/hash/efc9f7456a/publication/333/>



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