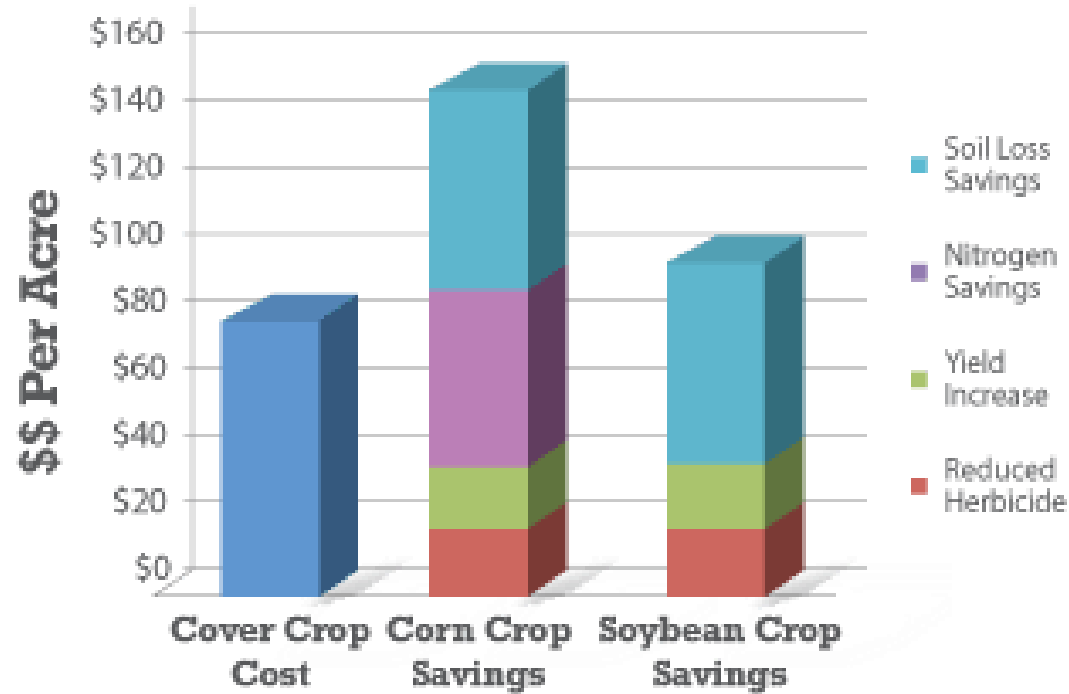


Carbon Markets For Agriculture
Putting Action into Science
The players and how it gets funded

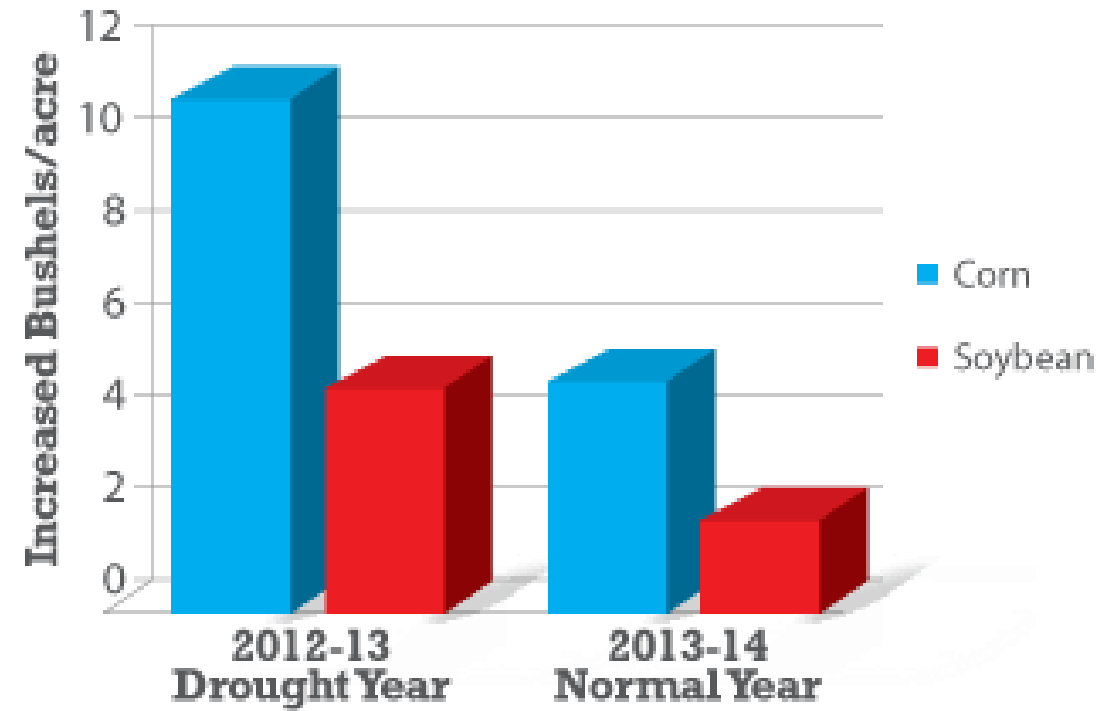
Ray Seidler, PhD. Environmental Microbiologist
US EPA senior research scientist

Putting carbon back into the soil:

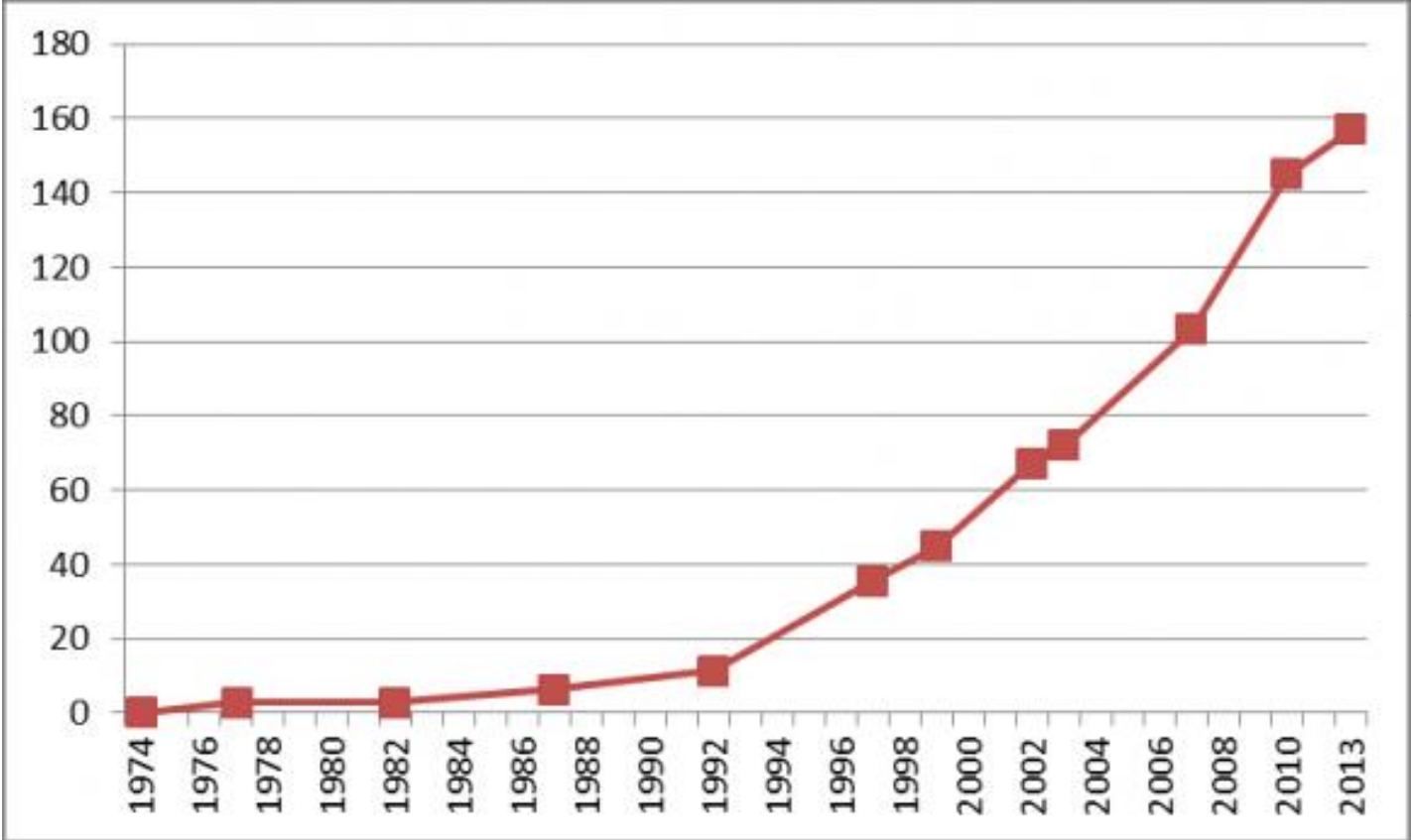
Saves Money



Increases Yields



GLOBAL INCREASE IN MILLIONS OF HECTARES OF CONSERVATION AGRICULTURE (CA) OVER TIME



395 MILLION GLOBAL CROPLAND ACRES

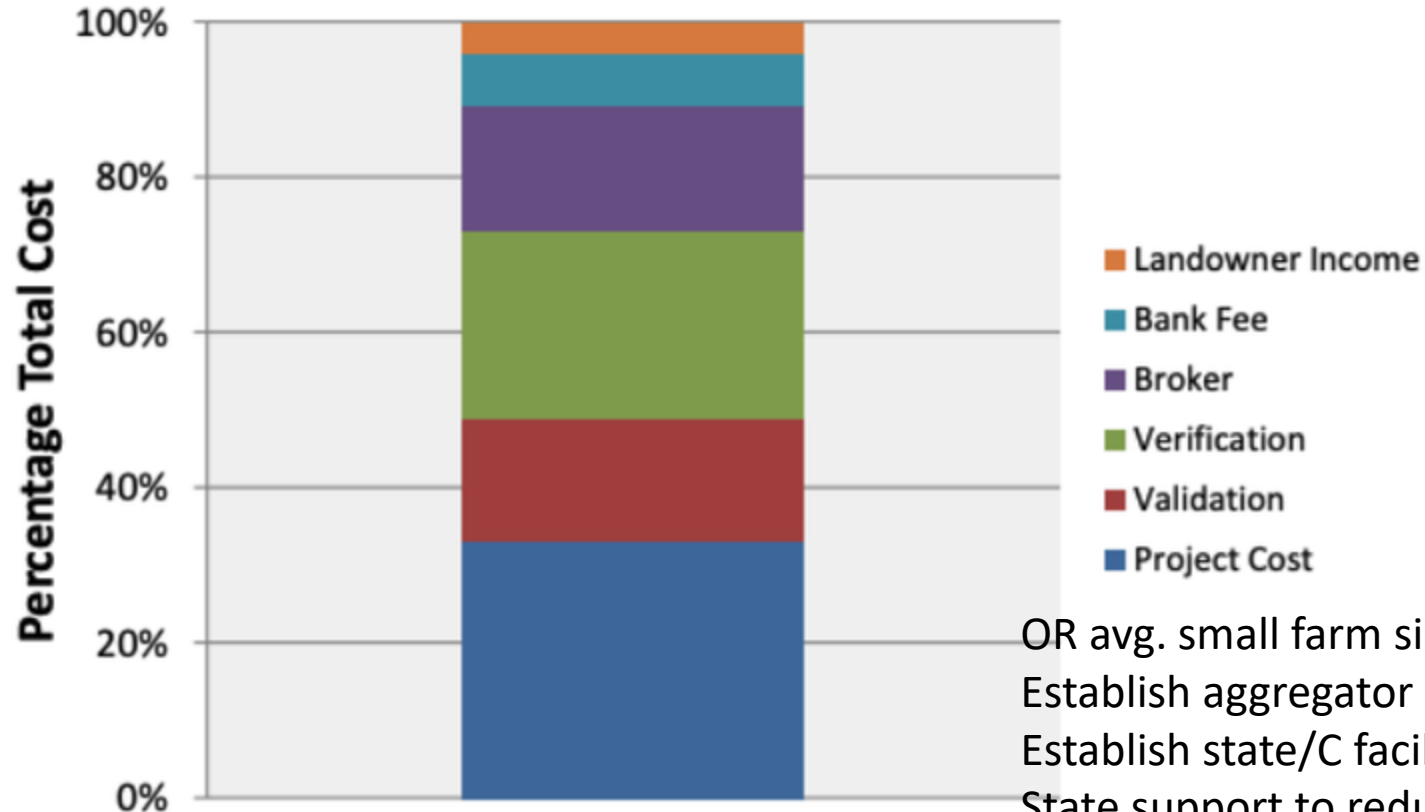
ABOUT 12.5% OF ARABLE LAND

greater productivity and farm output,
reduced cost of production and
improved profitability, greater resilience to biotic and abiotic stresses, minimizing soil erosion, builds soil health, sequesters soil carbon from the atmosphere
WHY AREN'T FARMERS STANDING IN LINE TO LEARN CONSERVATION AG PRACTICES?

What does it take to get a credit to market?

\$3,000-\$5,000/project
Validation, C measurements,
Legal papers, etc.

Hypothetical Carbon Project



OR avg. small farm size can't work (half < 20 acres)
Establish aggregator process; ODA project?
Establish state/C facilitator liaison education;
State support to reduce validation, etc costs
Incentivize by tax exempted soil C income

CARBON MARKETPLACE IS DRIVEN BY

Compliance (mandated) or voluntary carbon removal programs

SOME COMMON PLAYERS IN THIS ARENA:

Australia Emissions Reduction Fund, **PUBLIC FUNDING** plus recent offset program

CHSP, Smart Farming CDFA, **OFFSETS AND PUBLIC FUNDING**

Nori, Indigo Carbon, Terrapass, etc **CONNECT BUYERS AND SUPPLIERS OF CARBON REMOVALS**

CALIFORNIA CLIMATE SMART AND HEALTHY SOILS PROGRAM

Primarily small to medium size grants to farmers via U.Cal extension service and CDFA

California Climate Smart Agriculture Program

Almost \$400 million invested | >1,600 grants | > 1.2 MMT CO₂

Sustainable Ag
Lands
Conservation
Program
(SALCP)



State Water
Efficiency &
Enhancement
Program
(SEEP)



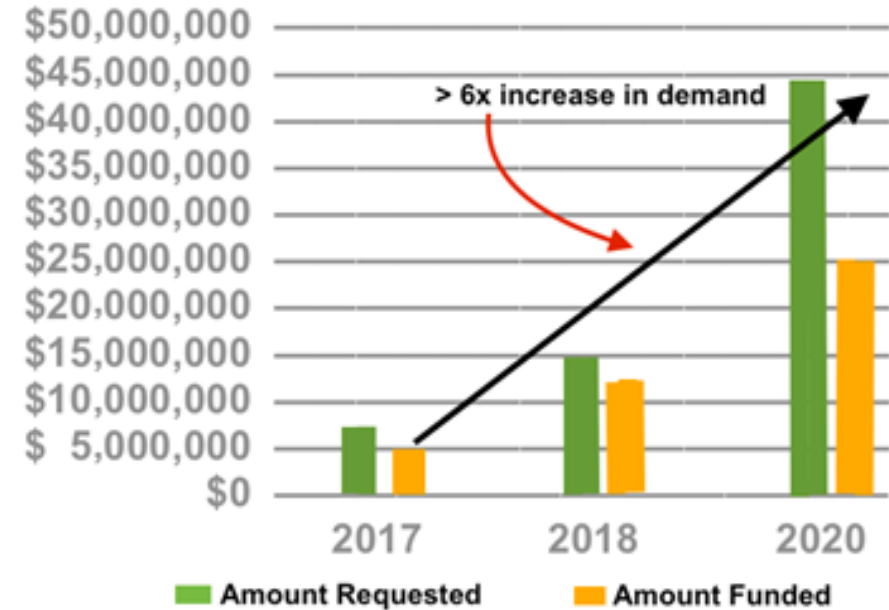
Alternative
Manure
Management
Program
(AMMP)



Healthy
Soils
Program



Healthy Soils Program Demand



Recent 2020 Washington State Healthy Soils Program;
Baseline soil health assessments, WSU researchers,
WSDA soil health specialist;
Management and soil health research \$1.3 million funded

2019 New Mexico Healthy Soils Act; pilot projects \$361K
Administered by NMDA; 38 grants <\$25K/133 applicants;
implementation through SWCD; a voluntary incentives
program and a support system. Land managers are offered
access to soil health testing, education and training

PUBLICLY FUNDED AUSTRALIAN EMISSION REDUCTION FUND

The Benefits of Soil Carbon Credits

Soil Carbon Credits



What would you like to do on your land to store carbon and ear credits?

Store carbon *in* soil

Plant seeds or seedlings establish a permanent forest

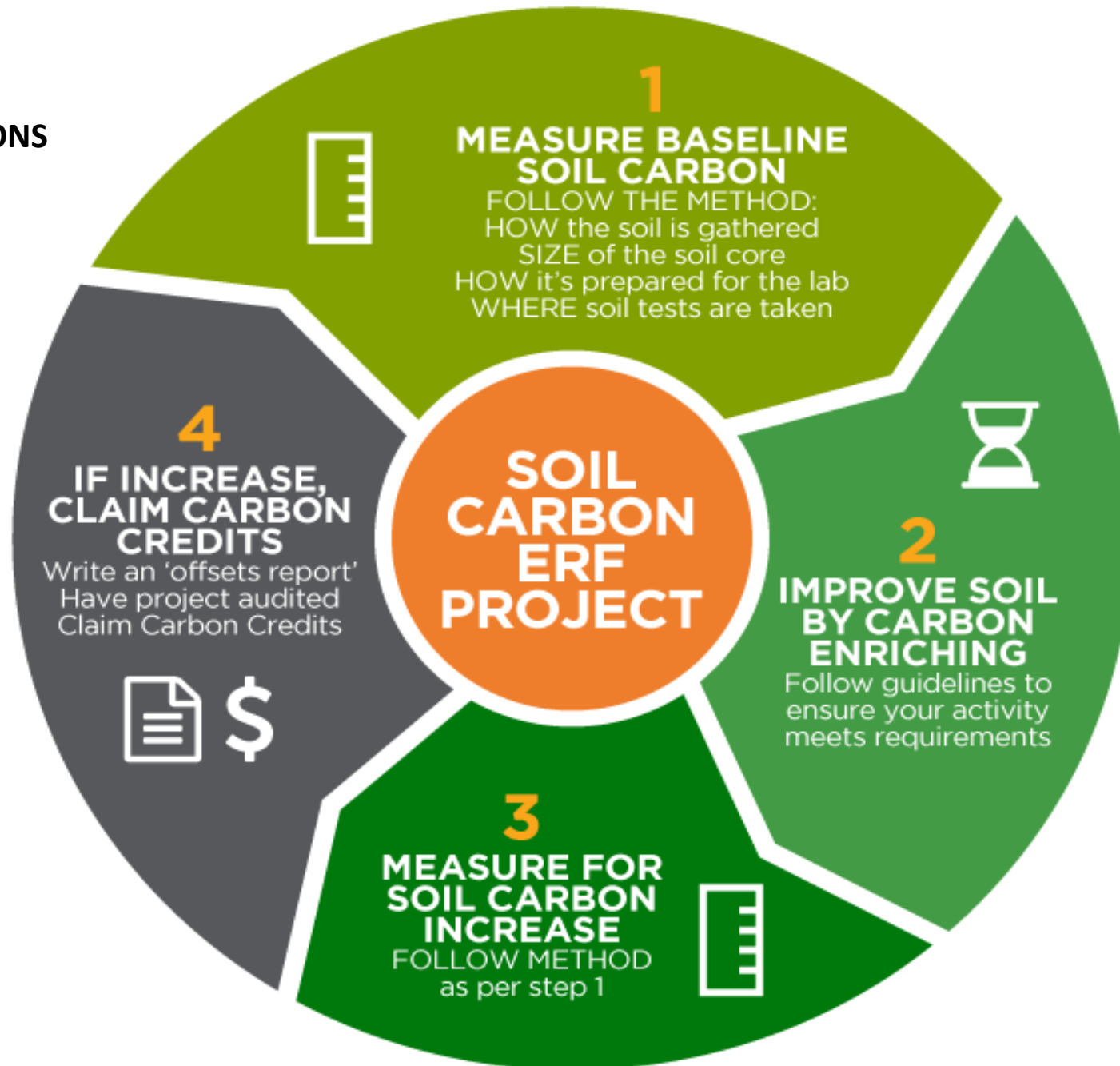
Plant seed or seedlings to establish a forest plantation for harvesting

Protect or maintain the existing native forest (needs clearing permit)

Let degraded land revert to native forest

SEQUESTER CARBON IN AGRICULTURAL LANDS

**AUSTRALIAN EMISSIONS
REDUCTION FUND**



**CLEAN ENERGY
REGULATOR SETS RULES**

STEP 0

Define your project

Aggregator assistance

Govt. auditor

Sign contract

Emissions Reduction Fund contract portfolio

12th Auction 12-13 April 2021

Released 23 April 2021



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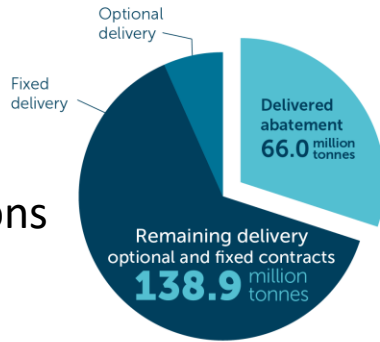
\$108.3 million committed at the 12th Auction

\$2.5 billion committed in total

\$830.8 million paid*

*As at 11 April 2021

All OR. Ag emissions
Approx 8MT CO2



*Figures exclude volume terminated/lapsed contracts = 17.3 million tonnes

	Vegetation	138.6 million tonnes
	Landfill and waste	25.9 million tonnes
	Agriculture	15.0 million tonnes
	Savanna burning	13.6 million tonnes
	Energy efficiency	5.5 million tonnes
	Facilities	3.4 million tonnes
	Industrial fugitives	1.7 million tonnes
	Transport	1.2 million tonnes

Portfolio of abatement **205 million tonnes**

Total contracted abatement*



Contract portfolio



Average price per tonne of abatement

Average across portfolio **\$12.32**

Auction 1	\$13.95
Auction 2	\$12.25
Auction 3	\$10.23
Auction 4	\$10.69
Auction 5	\$11.82
Auction 6	\$13.08
Auction 7	\$13.52
Auction 8	\$13.87
Auction 9	\$14.17
Auction 10	\$16.14
Auction 11	\$15.74
Auction 12	\$15.99

POLLUTERS PAY FARMERS, FORESTERS, OTHERS WHO HAVE SEQUESTERED C. OR REDUCED EMISSIONS
SELLERS PROVIDE VERIFIED CERTIFICATES OF CARBON SEQUESTERED

C offset program

reduction of greenhouse gas emissions in order to compensate for emissions made elsewhere

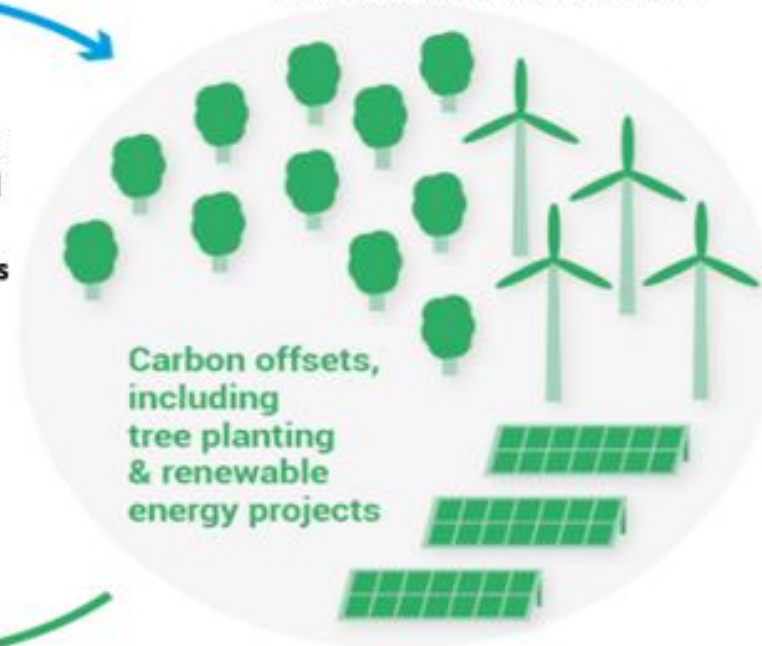
Want to buy sequestered carbon, erase footprint



Investments
in emission reduction projects

C sequestration
ag., forests

sequestered carbon to sell



"Title House" brokers
Inbetween buyers and
sellers
Indigo, Nori, Terrapass

Make buying offsets
easier

guarantee amts.
C sequestered



certificate obtained
for payment of
carbon offsets

IF 25% of Oregon's 16 million farmed acres sequester 0.5 tons/ac as C ALL GHG emissions from Oregon agriculture (6-8MT, CO2 equiv) would be removed from the atmosphere
25% X 16 mil ac = 4 mill ac X 0.5 t/ac as C = 2MT C X 3.67 = 7.4 Mt as CO2 equiv.
AT AN ANNUAL VALUE OF \$110 MILLION IN THE CARBON MARKETPLACE.

