AGENDA

Agriculture, Forest, Fisheries, Rural Communities, and Tribes Work Group

September 21, 2017 10 AM – 11:45 AM Hearing Room 50 State Capitol (ground level)

https://www.oregonlegislature.gov/citizen_engagement/Pages/Legislative-Video.aspx

Welcome and Introductions - Senator Michael Dembrow and Representative Ken Helm

Work Group Charge and Questions and Guiding Principles – Representative Ken Helm

Background Presentations:

Overview of Cap-And-Invest Policy

Colin McConnaha, Senior Climate Policy Advisor, Department of Environmental Quality

How Does Cap-And-Invest Affect Rural Economies and Communities?

Kathie Dello, Associate Director, Oregon Climate Change Research Institute

Peter Weisberg, Senior Portfolio Manager, The Climate Trust

Roger Gray, CEO, Northwest Requirements Utilities

How Do Offsets Work?

Sean Penrith, Executive Director, The Climate Trust

Carina Miller, Confederated Tribes of Warm Springs

Roundtable Work Group Discussion - All

Opportunity for Public Comment

Wrap-up and Next Steps - Representative Ken Helm

Adjourn

Presentation on GHG Cap and Trade Program (McConnaha, DEQ) 9/21/17

Greenhouse Gas Cap & Trade Program

Colin McConnaha, DEQ Senior Climate Policy Advisor



Greenhouse Gas Cap & Trade Program | Oregon Department of Environmental Quality





Elements of a cap & trade program

- Scope
 - Point of regulation
- Emissions cap
- Allowance distribution
 - Revenue
- Cost containment
 - Offsets



Emissions covered by cap



Points of regulation

Transportation fuels

- Terminal racks
- Importers

Natural gas

- Utilities
- Pipelines
- Large industrial users

Electricity

- In-state generators
- Importers

High emitting facilities

- Industrial process
- Large natural gas users



Emissions cap

- Align with Oregon's GHG targets
- Cap declines over time
- Key consideration for linkage with other jurisdictions



Allowance distribution methods

- Auction
- Free
- Consignment (hybrid)



Revenue

- Revenue from transportation may be restricted
- Remaining auction revenue could:
 - Benefit disadvantaged & rural communities
 - Minimize impacts to utility rates
 - Further reduce emissions
 - Other state priorities



Approx. revenue in 2021 (\$millions)

VERY rough estimate of potential revenue generated by auction of allowances



Cost containment

- Banking
- Linkage
- Price floor
- Price ceiling
- Offsets



Questions?

Colin McConnaha, DEQ Senior Climate Policy Advisor



Greenhouse Gas Cap & Trade Program | Oregon Department of Environmental Quality

Presentation on Climate Change in Oregon (Dello, Oregon Climate Change Research Institute) 9/21/17

climate change in Oregon

Kathie Dello, Associate Director Oregon Climate Change Research Institute occri.net





key findings from 2017 report

- climate change will continue to impact the health of Oregonians, especially vulnerable populations,
- Oregon will continue to warm; we can now attribute some regional trends to human activity
- declining mountain snowpack is, and will have significant impacts on water resources
- increased coastal flooding and erosion
- ocean acidification
- shifting climates plus disturbances (fire, insects, diseases) will drive forest change
- short-term gains for agriculture, but long-term dependent on adaptations to heat and water
- recent climate events a practice run for the future

Eagle Creek Fire, September 2017

Kathie Dello, photo



OR summer precip departures v temp departures, 1895-2017



OR summer precip departures v temp departures, 1895-2017



OR summer precip departures v temp departures, 1895-2017



+2.2°F to +8.9°F by the 2050s

Source: Rupp et al. (2016), adapted for Oregon; Integrated Scenarios project

Ag impacts: historic (1971-2000) vs future high emissions (2050s)

Cold Hardiness Zones

Data Source: MACAv2-METDATA, Multi-Model Mean daily minimum temperatures



ag, transportation, social impacts

Projected Change in Hottest Day (Annual Average) RCP4.5 2040-2069 vs. 1971-2000

Data Source: Data Source: MACAv2-METDATA 4-km dataset (U Idaho), Multi-Model Mean



Source: NW Climate Toolbox

from Hoodoo web cam February 23, 2015







Projected Changes in April 1st Snow Water Equivalent



Source: Climate Central

Local Sea Level Rise Projections



OCAR 2017



summary

- climate change will continue to effect Oregonians
- Oregon will continue to warm in all seasons, especially summer
 - fire, snow, agriculture temperature sensitive, cascading social, economic, and ecological effects
 - reducing global emissions will reduce warming
- big fire seasons in past 15 years tend to be hot, dry summers
- coastal impacts with global sea level rise and coastal flooding, crucial infrastructure at risk
- frame questions to "did climate change make this event/season more likely"

key findings

- climate change will continue to impact the health of Oregonians, especially vulnerable populations,
- Oregon will continue to warm; we can now attribute some regional trends to human activity
- declining mountain snowpack is, and will have significant impacts on water resources
- increased coastal flooding and erosion
- ocean acidification
- shifting climates plus disturbances (fire, insects, diseases) will drive forest change
- short-term gains for agriculture, but long-term dependent on adaptations to heat and water
- recent climate events a practice run for the future

Presentation on Cap & Invest: Rural Economic Development Opportunities (Weisberg, The Climate Trust) 9/21/17



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Cap & Invest: Rural Economic Development Opportunities

Peter Weisberg Senior Portfolio Manager The Climate Trust

9/21/17

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



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



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



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.











CLIMATE TRUST CAPITAL



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.



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.



\$1.2B in Cumulative Implemented Funds*



34%

projects located in disadvantaged communities (\$419M)

> Source: California Climate **Investments 2017 Annual Report**

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

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 \rightarrow \$3.6 billion per year



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/

Peter Weisberg 503-238-1915 pweisberg@climatetrust.org

Presentation on How Do Offsets Work (Penrith, The Climate Trust) 9/21/17



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How do offsets work?

Agriculture, Forest, Fisheries, Rural Communities, and Tribes Work Group

Sean Penrith Executive Director The Climate Trust 9/21/17

What is an offset

- Represents a verified emission reduction (VER) of 1 ton CO2_e from uncapped sector.
- In a cap & trade program, a carbon offset can be used to compensate for an emission made elsewhere under the cap.
- Must be: Real, permanent, quantifiable, verifiable, enforceable, and additional.
- "Additionality" requirement requires that reductions would not otherwise have occurred in a "conservative business-as-usual scenario."



Purpose: Cost containment

C&T regulator has to consider:

- How to manage compliance costs.
- Impact of associated pass-through of those costs to consumer.
- How long to give covered entities time to on-ramp towards increasingly stringent reductions goals.
- World Bank's 2016 Carbon Pricing State & Trends Report states, "greater cooperation through carbon trading could reduce the cost of climate change mitigation by 32% by 2030.



Figure 1: Price curves with varying offset usage post-2020





Source: ICIS

How are they created?

Use existing protocol to issue compliant credits for a cap and trade program



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Offset project protocols



Adopted	In-Progress	California	Quebec	Ontario
Forest*				
Livestock (Manure)				
Livestock (Ente	eric)			
Rice Cultivation				
Fertilizer Management				
Avoided Grassland Conversion				
Conservation C	ropping			
Urban Forest				
ODS Destruction	ı			
Landfill Gas Des	truction			
Mine Methane C	apture			
Refrigeration System	stems			
Organic Waste N	<i>l</i> anagement			
Organic Waste D	Digestion			

*Note that the CA, QC, and ON forest protocols are not identical in their scope of project activities, and the new ON/QC protocol is likely to be split into multiple protocols

Utilization Rate

- CA AB398: Reduces offset usage limit from 8% to 4% (2021-2025) and then 6% (2026-2030)
 - Requires that 50% of offsets used must offer environmental benefit to the state
 - Establishes a Compliance Offsets Protocol Task Force

- Quebec has included an 8% usage limit
- Ontario has also included an 8% limit



Offsets issued





The Challenge

- "....offsets were primarily linked to projects outside of California, and large emitters of GHGs were more likely to use offset credits to meet their obligations under cap-and-trade."
- Note, for a covered entity in California, offsets are a substitute for allowances. Without offsets, emitters would purchase more allowances until the price of allowances exceeds the cost of direct emission reductions as per the design intent of a cap and trade program.
- The allowance price drives the decision about whether to reduce emissions at the source.



Allowance Secondary Market Activity



COMPLIANCE OFFSET PROJECTS SENATE DISTRICT TWO: FACTS AND FIGURES

34 AB32 OFFSET

FORESTRY PROJECTS 229,000 ACRES SUSTAINABLY MANAGED 17,600,000

METRIC TONS OF CARBON DIOXIDE EMISSIONS SEQUESTERED¹, EQUIVALENT TO: 644.000

HOMES' ENERGY USE FOR ONE YEAR²

\$184,000,000 **GENERATED BY OFFSET PROJECTS** IN CA³ \$30,436,993 AB32 REVENUE INVESTED IN SD2⁴, **RESULTING IN:** 529,994 METRIC TONS OF CARBON DIOXIDE EMISSIONS REDUCED, EQUIVALENT TO: 55,966 HOMES' ENERGY USE FOR ONE YEAR²

 1 metric ton of CO2 emissions sequestered = 1 ARB offset credit. The 17.6M figure is representative of all ARB credits issued from 34 projects to date, as well as credits verified by 3rd party and awaiting conversion to ARB system

- 2. Based on EPA GHG Equivalencies Calculator
- 3. Based on conservative offset credit pricing via Californiacarbon.info May 1, 2017
- GGRF funds implemented based on ARB allowance auction proceeds data, May 2017



Offset Utilization

- Over the 2013-2015 period, of all the instruments used for compliance under the cap and trade system, allowances totaled 372 million and offsets totaled just 20 million.
- Offsets represented just 5.3% of all compliance instruments surrendered to ARB (historic WCI average 4.5%).
- Until allowance floor prices escalate, the utility of offsets as a cost containment mechanism is yet to take full effect.
- Larger corporations do use offsets more than smaller ones because they have the resources to manage the associated (invalidation, delivery, etc.) risks of acquiring offsets.



Offsets & Linkage

- Each of the 6 ARB protocols incorporate requirements of Division 25.5 of Health and Safety Code: Real, permanent, quantifiable, verifiable, enforceable, and additional.
- Ontario Linkage:
 - Ontario has proposed a regulatory framework for offsets; is working on 13 offset protocols.
 - Will satisfy the applicable requirements in Division 25.5 of the Health and Safety Code, by representing reductions that are real, permanent, quantifiable, verifiable, enforceable, and additional.
 - Ontario's proposed offsets regulation uses a definition of additionality similar to ARB's.
 - Aggregation allowed, but only at an administrative level.
 - No buyer invalidation liability, but risk buffer contribution for all projects.
- Ontario, Quebec and California are expected to announce the linkage of their carbon markets under WCI 9/21/17 during Climate Week in NYC.

Attorney General's Advice to the Governor Concerning Linkage of California and Ontario Cap-and-Trade Programs

CONCLUSION

We believe the Governor has an adequate basis to make each of the four findings required by Government Code section 12894(f), thereby permitting ARB to move forward with the proposed linkage with Ontario.

Please contact us if you have any questions.

Sincerely, ROBERT W. BYRNE Senior Assistant Attorney General XAVIER BECERRA For Attorney General



On Additionality

- This interpretation and method of implementing the AB 32 statute was upheld by the Court of Appeal in Our Children's Earth Foundation v. ARB (2014)
- Stanford 2017 report examined 39 forest offset projects that have been credited by CA to answer two questions:
 - 1) Are forest offsets providing real climate benefits?
 - 2) Are forest offsets providing other benefits, such as supporting habitat for rare species or opportunities for recreation?

"Our analysis shows that California's forest offsets account for a small percentage of emissions reductions, by design. Yet at the same time, they provide an important opportunity to supply meaningful carbon sequestration and multiple co-benefits. California's pioneering program demonstrates that forest-based offsets are feasible in a compliance market."


On AB 398's cost containment impact...

California Carbon's Impact Analysis of AB398's reduced offset usage limits:

- Would significantly increase the program's reliance on the price ceiling reserve despite 'speed bumps."
- The market "might expect to see a significant increase in the cost of compliance through 2030."
- This added cost could be as high as \$16 billion.



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Work Group Homework Questions to Answer for Next Meeting (9/21/17)

Meeting #1 -- Homework Questions

DIRECTIONS: No later than one week prior to the second work group meeting, please send your responses to the questions below to committee staff (<u>beth.patrino@oregonlegislature.gov</u> or <u>beth.reiley@oregonlegislature.gov</u>). As you prepare your responses, please consult with others in your organization or industry, particularly any located in jurisdictions currently participating in the Western Climate Initiative.

Question 1: What aspects of a cap-and-invest policy as it is being discussed in Oregon are you most concerned about for your organization/industry/constituents/customers?

Question 2: What changes would you suggest be made to cap-and-invest as it is currently being discussed to address the concerns you have?

Question 3: What opportunities do you believe exist for your organization/industry/constituents/ customers from implementation of a cap-and-invest policy as it is currently being discussed in Oregon?