Climate Protection Program:
Rulemaking Advisory Committee Meeting 4

April 22, 2021
9 a.m. - 4:30 p.m.

RAC #4 Agenda

Time	Topic
9 a.m.	Welcome
9:05 a.m.	Meeting ground rules, procedures for public comment
9:15 a.m.	Remarks by Director Whitman
9:30 a.m.	Review committee work plan and upcoming meetings
9:45 a.m.	Regulation of stationary source emissions
11 a.m.	Break
11:15 a.m.	Further considerations for community climate investments
12 p.m.	Public comment period #1
12:15 p.m.	Lunch
12:45 p.m.	Initial modeling policy scenarios results review and discussion
2:15 p.m.	Break
2:30 p.m.	Discussion of fourth modeling policy scenario
3 p.m.	Identifying covered entities and compliance instrument distribution for fuels sectors
4:10 p.m.	Next steps
4:10 p.m.	Public comment period #2
4:30 p.m.	Adjourn meeting

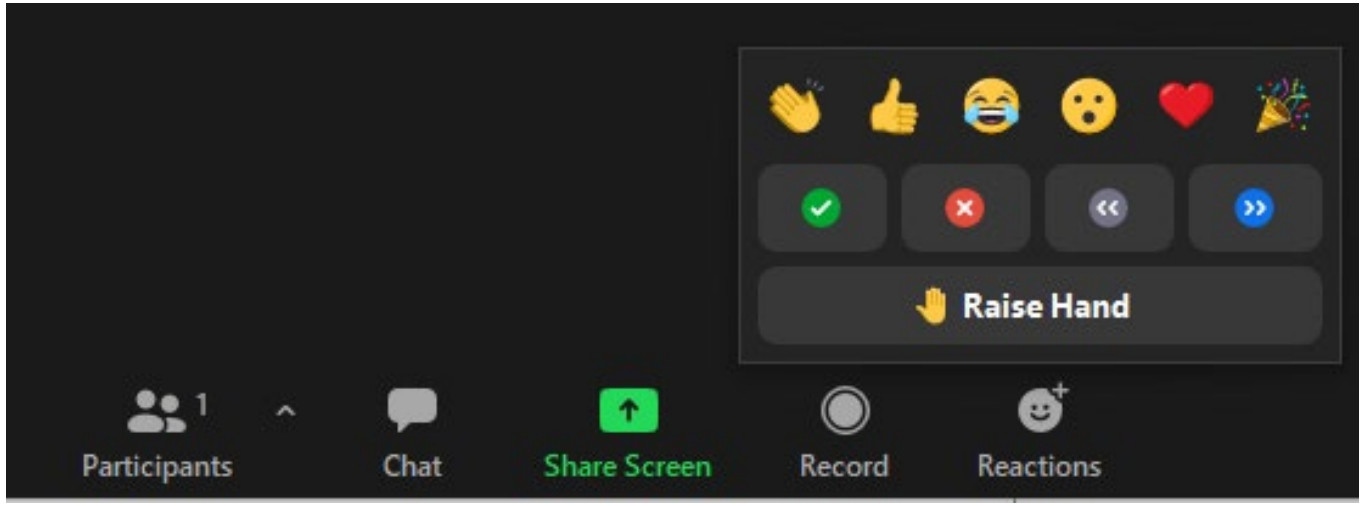
Participation Tips

Thank you for joining us today!

- Please join audio by either phone or computer, not both.
- RAC members: stay on mute when not speaking, and please join us on video if able
- Public: please stay on mute and please join us on video only when you're speaking
- For discussion and comments, use "Raise Hand" button to get in the queue; if joined by phone press *9
- Say your name and affiliation before speaking
- Move around and take care of yourself as needed!
- For Zoom technical issues, send chat message to host

How to Raise Hand

Look for the Raise Hand in Zoom panel



Public Participation Protocols

- Public participation is welcome – thank you!
- Two public comment periods
  - 11:45 a.m. – 12 p.m.
  - 4:10 – 4:30 p.m.
- Time for public comment, though primary purpose is RAC discussion
- When making comments, please respect time limits and ground rules
- Welcome to provide written comments
  - GHGCR2021@deq.state.or.us
  - Requested by April 30

Committee Discussion Guidelines

- Honor the agenda and strive to stay on topic
- Provide a balance of speaking time
- Listen to understand and ask questions to clarify
- Stay engaged and be open about your perspective and experience
- Address issues and questions – focus on substance of comments
- Bring concerns and ideas up for discussion at the earliest point in the process

DEQ and Kearns & West

Oregon DEQ

Colin McConnaha
Manager, Office of GHG Programs

Nicole Singh
Senior Climate Policy Advisor

Matthew Espie
Climate Policy Analyst

Lauren Slawsky
Climate Policy Analyst

Matthew Davis
Senior Policy Analyst

Kearns & West

Sylvia Ciborowski
Senior Director / Facilitator

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Happy Earth Day from Oregon DEQ!

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RAC Work Plan Updates

April 22

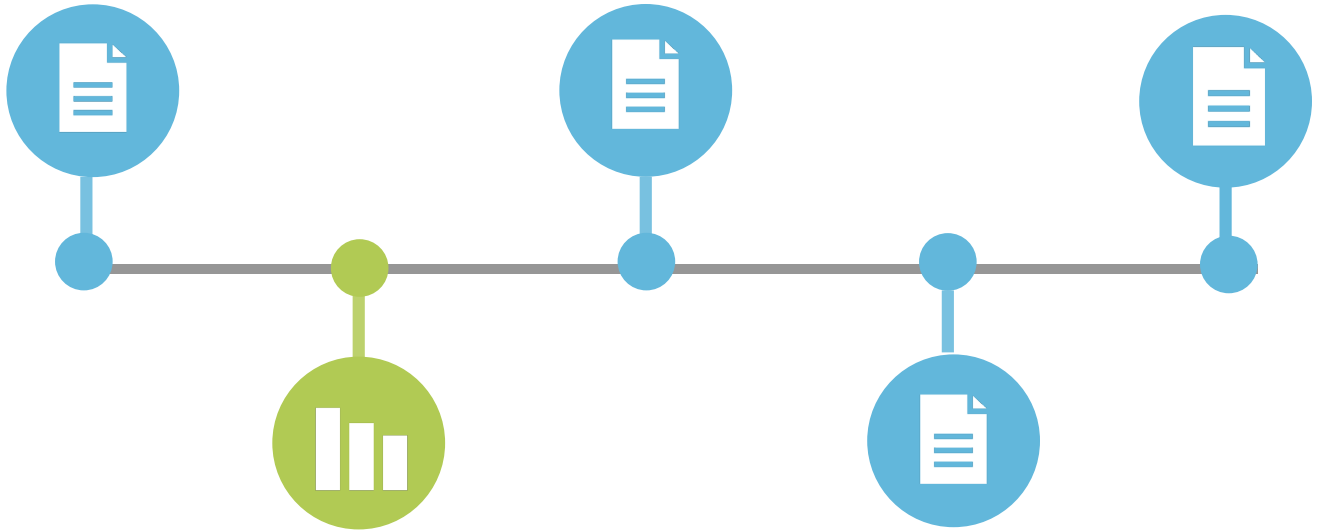
RAC4: Program design, complete initial modeling results review

May 25

RAC5: Overview draft rules, program design, some modeling

July 8

RAC 7: Review of fiscal impacts analysis, Draft rules



April 28

Modeling Q&A: Questions on modeling results and assumptions

June 17

RAC6: Draft rules, final modeling results review

Meeting	Date	Comments Requested
RAC4	April 22, 2021	April 30, 2021
Modeling Q&A	April 28, 2021	
RAC5	May 25, 2021	June 3, 2021
RAC6	June 17, 2021	June 25, 2021
RAC7	July 8, 2021	July 16, 2021

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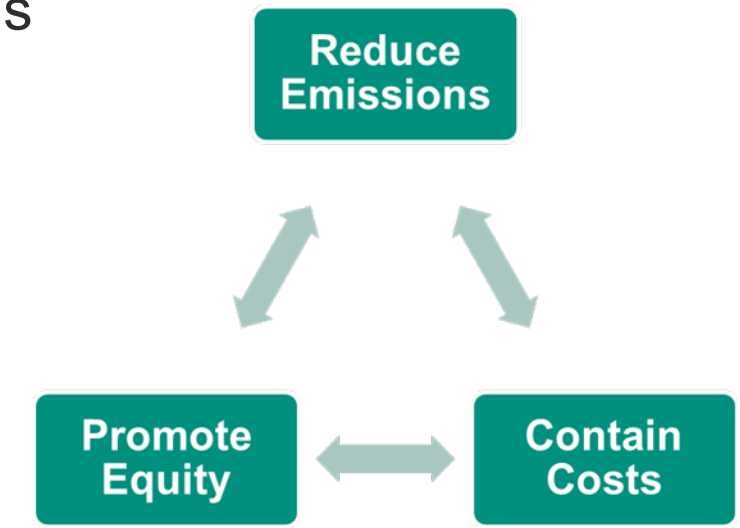
Regulating Stationary Source Emissions

- DEQ leaning is proposing to regulate natural gas emissions at natural gas utilities
- Considering a more traditional facility-specific and direct regulatory approach for the remaining covered stationary source emissions
- Best available emissions reduction assessment
  - Assessing site-specific best available emission reductions and requiring implementation of those emission reductions
- Specific circumstances may make this a better approach for regulating stationary sources & achieving program goals

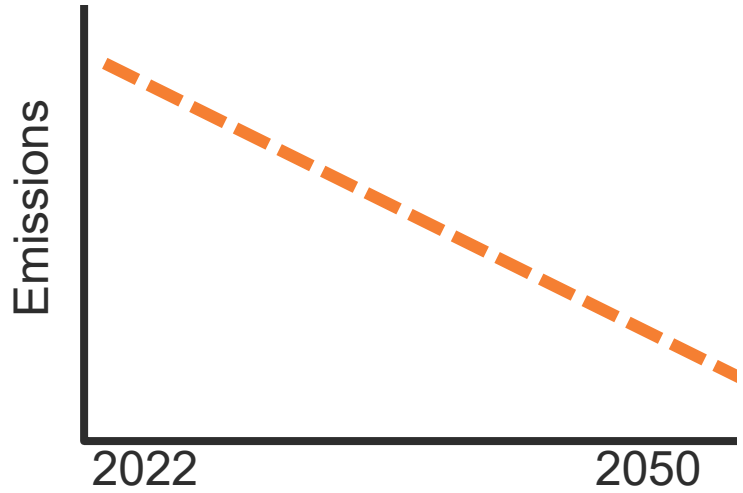


Best Available Emissions Reduction Assessment

- Different industries, different manufacturing processes, different emissions reduction technologies and opportunities, different practices
- Overall industrial manufacturing process emissions not a significant source of emissions
  - Small number of facilities responsible for most of these industrial emissions
- Sources would need to pursue on-site emissions reductions
- DEQ could analyze and consider potential relationships between greenhouse gas emissions reductions and other air pollutant reductions at facilities

How CPP Could Work: Fuel Suppliers & Natural Gas Utilities

Every year, the emissions limit will decline toward a target



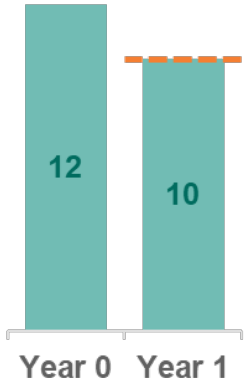
DEQ will distribute a number of **compliance instruments** to match the emissions limit each year, meaning both decrease over time.

1 compliance instrument = **1 metric ton allowable emissions**

How CPP Could Work: Fuel Suppliers & Natural Gas Utilities

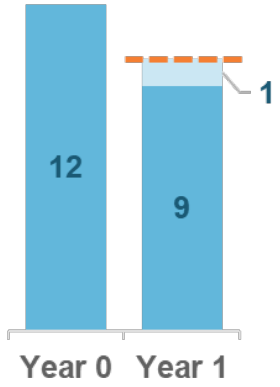
Entity A
Natural gas utility

Reduces emissions by using more renewable natural gas



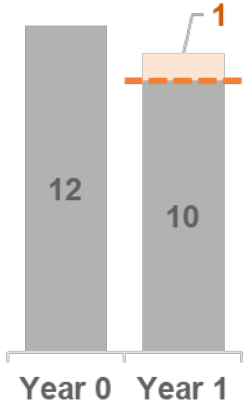
Entity B
Transportation fuel supplier

Reduces emissions earlier by increasing mix of biofuels, sells extra to Entity D



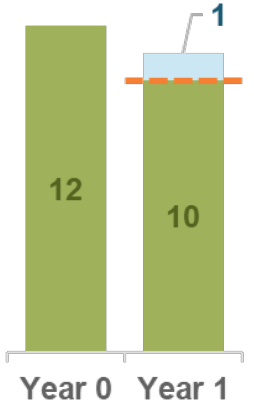
Entity C
Transportation fuel supplier

Cannot make enough immediate reductions, but could invest in community climate projects



Entity D
Natural gas utility

Cannot make enough immediate reductions, buys from Entity B



Illustrative Example:

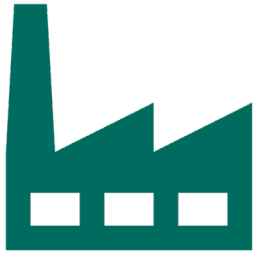
- DEQ has 40 compliance instruments to distribute to four regulated entities
- Each entity receives 10 compliance instruments from DEQ
- All emitted 12 metric tons last year
- Each needs to reduce their emissions

How CPP Could Work: Stationary Sources

- Site specific, direct regulation, using best available emissions reduction approach
- Approximately 10-15 facilities with potentially regulated emissions greater than 25,000 MT CO2e

Potentially applied to:

- Industrial process emissions
- Solid fuels combustion emissions
- Natural gas directly from interstate pipeline



Site-specific considerations

Best technology, production operations, business practices to reduce emissions

Best Available Emissions Reduction Assessment: Process

- Facilities
  - Periodically provide information to DEQ and offer assessments of available technologies and practices to reduce emissions
- DEQ
  - Review the information provided by sources
  - Determine requirements
  - Notify sources of what they need to do to reduce emissions
  - Collaborate with independent environmental experts, community members, consultants, or others
  - Collaborate across state air pollution programs (Cleaner Air Oregon, etc.)

Best Available Emissions Reduction: Process

- DEQ would need to determine
  - What factors the assessments would consider and evaluate
  - How often the assessment would occur
- Researching current methodologies used to implement site-specific air pollution regulations

Discussion Questions

- What are your thoughts on regulating stationary source emissions with a site-specific best available emissions reduction approach instead of the use of compliance instruments?
  - What do you see as the potential benefits and the challenges to using this approach for stationary sources?
- What might DEQ need to consider when determining whether a source has met best available emissions reduction assessment?
  - What factors should be considered and evaluated as part of the assessment?
- Any other suggestions for how to conduct this assessment?

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Community Climate Investments: Further Discussion

- Community Climate Investments would be the optional alternative compliance option for CPP
- Intended to:
  - Reduce or sequester emissions
  - Provide a compliance option, in addition to reducing emissions, banking, and trading
  - Promote an equitable energy transition, reduce co-pollutants, and reduce costs for environmental justice and other impacted communities
- Communities would be central to determining which projects are implemented
  - Projects in Oregon
  - Process to prioritize projects in environmental justice and impacted communities
- Use of CCIs limited by allowable use percentage, not availability of projects

Community Climate Investments: Further Discussion

- DEQ would certify one or more third parties as recipients of funds
  - Would need to establish eligibility criteria
- DEQ would establish a price for each credit
  - Intended to support a variety of projects in different communities equally
  - Promote equitable program benefits
  - Current leaning is to base price on EPA Social Cost of Carbon

Questions and Feedback

- Any reflections, comments or questions?

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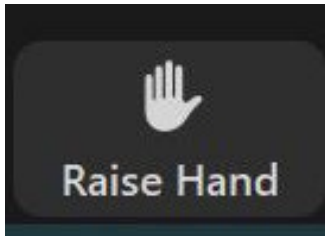
Public Comment Period

- Public comment period: 11:45 a.m. – 12 p.m.
- Raise your hand if you'd like to make a comment
- When making public comments, please:
  - Respect time limits as assigned
  - Use respectful language
  - Address issues and questions—focus on substance
  - When possible, relate comments to topics on the RAC agenda
- Members of the public welcome to provide written input to GHGCR2021@deq.state.or.us by April 30



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Modeling Policy Scenario Overview

- DEQ developed three modeling scenarios informed by RAC and public engagement
- Modeling policy scenarios are to inform development of the CPP
  - Do not represent all options for CPP design or specific CPP proposals
- Modeling policy scenarios are compared against a reference case
  - Projected world without CPP to help understand potential program outcomes

Policy Scenario Common Assumptions

Assumptions the same in each scenario

Key Topic	3 Initial Policy Scenarios
Cap Application	One cap applied across all sectors *(regulated sectors and therefore scopes of regulated emissions vary by scenario)*
Banking Allowed?	Yes; unlimited through time
Alternative Compliance Options Allowed?	Yes, and annual supply is assumed to be available up to allowable percentage *(allowable percentage varies by scenario)*
Expanded Complementary Policies	Clean Fuels Program assumed to expand from current 10% by 2025 target to 25% by 2035*

*DEQ intends to open a rulemaking in 2021 to develop expanded Clean Fuels Program targets

Policy Scenario Differing Assumptions

Key Topic	Policy Scenario 1	Policy Scenario 2	Policy Scenario 3
Cap and Trajectory	Straight line to 80% by 2050	45% by 2035 80% by 2050	50% by 2035 90% by 2050
Trading Allowed?	Yes	Yes, excluding stationary sources	Yes
Regulated Sectors	- Natural gas utilities - Non-natural gas fossil fuel suppliers - Large stationary sources with process emissions ≥ 25,000	- Natural gas utilities - Non-natural gas fossil fuel suppliers - Large stationary sources with process emissions plus natural gas emissions ≥ 25,000	- Natural gas utilities - Non-natural gas fuel suppliers with emissions ≥ 300,000 - Large stationary sources with process emissions ≥ 25,000
Sector Exclusions	- All natural gas supplied by interstate pipeline companies - Fuels used for aviation - Landfills; Electric Generators; stationary source process emissions below threshold	- Natural gas supplied by interstate pipeline companies that is not regulated at stationary sources - Fuels used for aviation - Landfills; Electric Generators; stationary source process emissions below threshold	- All natural gas supplied by interstate pipeline companies - Fuels used for aviation; emissions from fuel suppliers below threshold - Landfills; Electric Generators; stationary source process emissions below threshold

Policy Scenario Differing Assumptions

Key Topic	Policy Scenario 1	Policy Scenario 2	Policy Scenario 3
Natural Gas Point of Regulation	All natural gas regulated at utility, not at stationary source. Stationary sources are only regulated directly for process emissions above threshold.	Regulated at stationary sources if emissions are above threshold. Natural gas used at smaller stationary sources is regulated at utility supplier. Emissions from other uses such as at homes and commercial buildings is regulated at utility supplier.	All natural gas regulated at utility, not at stationary source. Stationary sources are only regulated directly for process emissions above threshold.
Allowable Use of Community Climate Investments (CCI)	Up to 25% of compliance obligation per year	Up to 5% of compliance obligation per year	Up to 25% of compliance obligation per year
CCI Price	EPA Social Cost of Carbon using a 2.5% discount rate (starts at $76 and increases to $116 in 2020$)		

Modeling Community Climate Investments

- An allowable use of CCIs is defined for each scenario
- CCI price is assumed to be EPA social cost of carbon using a 2.5% discount rate

Social Cost of CO_2
$2020 per metric ton

Year	2.5% Average
2020	$76
2025	$83
2030	$89
2035	$96
2040	$103
2045	$110
2050	$116

Modeling Policy Scenario Overview

- Summary results include GHG emissions, monetized health benefits, economic metrics, qualitative co-benefits and equity assessment
- CCIs are incorporated into emissions modeling, but benefits of CCI's not included in health and economic analysis
- Depending on the type of analysis results could be quantitative or qualitative

Emissions

Results for initial three policy scenarios

Emissions Results Overview

- All three scenarios model significant emissions reductions
  - At least 80% emission reductions by 2050
- Compliance flexibility measures play an important role in achieving emissions reductions
  - Banking used in all scenarios
  - CCIs used to the almost fullest extent in scenarios
- Trading and point of regulation had minimal effects in modeling
- Emissions reductions are driven by transportation sector
- Other reductions are achieved with building energy efficiency, electrification, and renewable natural gas

Emissions Results Overview

- For some years in some scenarios, net emissions inclusive of CCIs, banking, and trading may still be above the cap
- For two scenarios this only occurs near the end of the modeling time horizon
  - Important to remember that current technologies and costs are used in the modeling, but available technologies and their costs are likely to change and decline in the future, which would influence actual program outcomes along with program design features
- Modeling is conducted at the sector level (i.e., natural gas, other fuels) and sub-sector level (e.g., residential, cement manufacturing)
- Results are for emissions from regulated sectors (not statewide)

Policy Scenario 1 Results

- Cap is met in all years except 2050
- CCIs and banking make it possible to achieve the cap, particularly in later years
- Largest emissions reductions come from fuels, driven by expanded CFP, energy efficiency, and electrification
- Natural gas emissions reductions driven by energy efficiency, electrification and RNG

Policy Scenario 2 Results

- Cap is met through 2024; net emissions slightly above cap 2025-2050
- Maximum allowable CCIs used in most years
- Less availability of banked compliance instruments
- Net emissions above caps driven by combination of interim cap target, limit on use of CCIs, and largest quantity of regulated emissions
- More extensive residential and commercial electrification driving reductions
- Increased reductions from energy efficiency for non-natural gas fuels
- Approaching maximum technical potential for RNG as replacement for natural gas

Policy Scenario 3 Results

- Cap is met 2022-2042; net emissions above cap 2043-2050
- Maximum allowable CCIs used in most years
- Net emissions above cap in later period mainly driven by combination of lower caps compared to other scenarios and earlier full use of banked compliance instruments
- Available CCIs supports achievement of cap into later years
- Similar reductions from electrification, RNG, energy efficiency, and industrial processes as for Scenario 2

Health

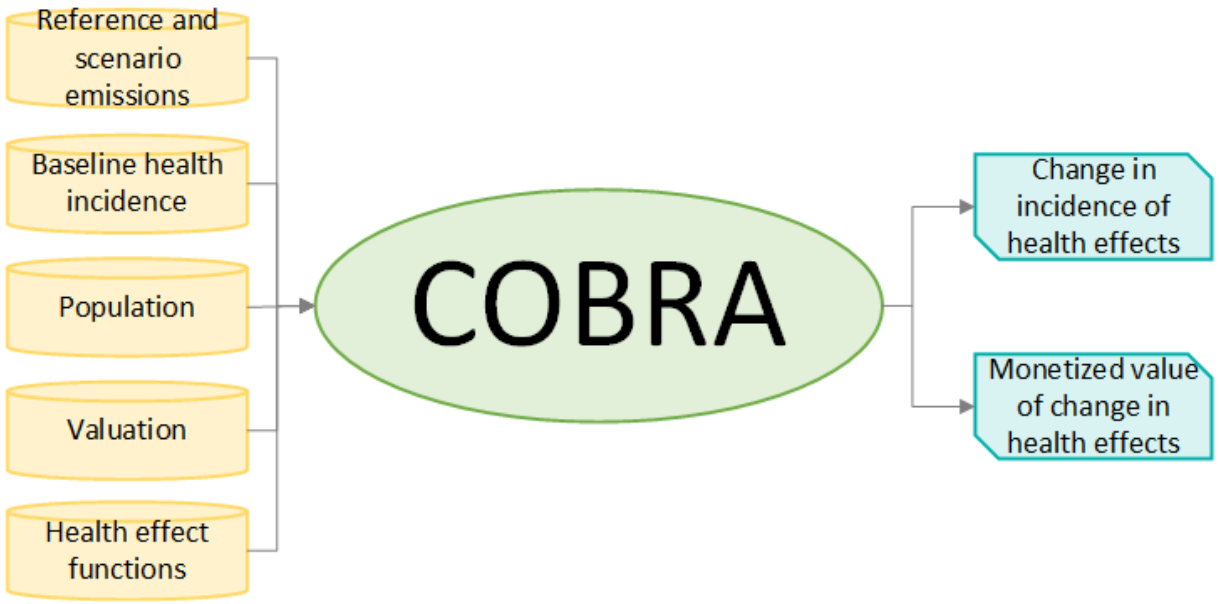
Results for initial three policy scenarios

Health Results Overview

- Health benefits of air quality improvements modeled using EPA's Co-Benefits Risk Assessment (COBRA) screening tool
- Monetized health benefits for scenarios as compared to reference case
  - Evaluated in comparison to a reference case for 3 years: near term (2025), mid-term (2035), and horizon (2050)
- All scenarios show significant positive health benefits as compared to reference case

Health Analysis Model

- COBRA estimates the public health impacts of changes in emissions of particulate matter (PM2.5) and its precursors (NOx, SO2, NH3, and VOC)
- Changes in human health outcomes and their economic value are estimated at the county or state levels



Health Modeling Assumptions & Data Sources

- Emission modeling results were mapped to COBRA categories
  - Sectors with no changes due to the policy scenarios (e.g. agriculture) are treated as having no change in emissions
- COBRA model captures emissions from fossil fuel combustion
  - Does not capture any industrial process emissions changes
- Health analysis also does not capture any potential benefits from CCIs

Health Modeling Assumptions & Data Sources

- State-level emissions were apportioned to counties and other parameters in the COBRA model using the model's default proportions for 2023
- COBRA population and incidence inputs customized with data from PSU/Metro and OHA
- Valuation of health endpoints scaled to future-year values, where possible[1]
- Future year benefits discounted to the start of the evaluation period (2022) at 3% and 7% discount rates[2]
  - Discounted to express future economic values in present terms

[1]Valuation projections available only for certain endpoints (mortality, acute bronchitis, asthma exacerbation, upper and lower respiratory symptoms)
[2]The discount rate accounts for the fact that people generally value future benefits and costs less than current costs and benefits. We discount the value of premature mortality occurring in future years using rates of 3% and a conservative 7%, consistent with EPA. (Estimating the Benefit per Ton of Reducing PM2.5 Precursors from 17 Sectors, 2018; BenMAP User's Manual, 2018; Guidelines for Preparing Economic Analyses, 2010)

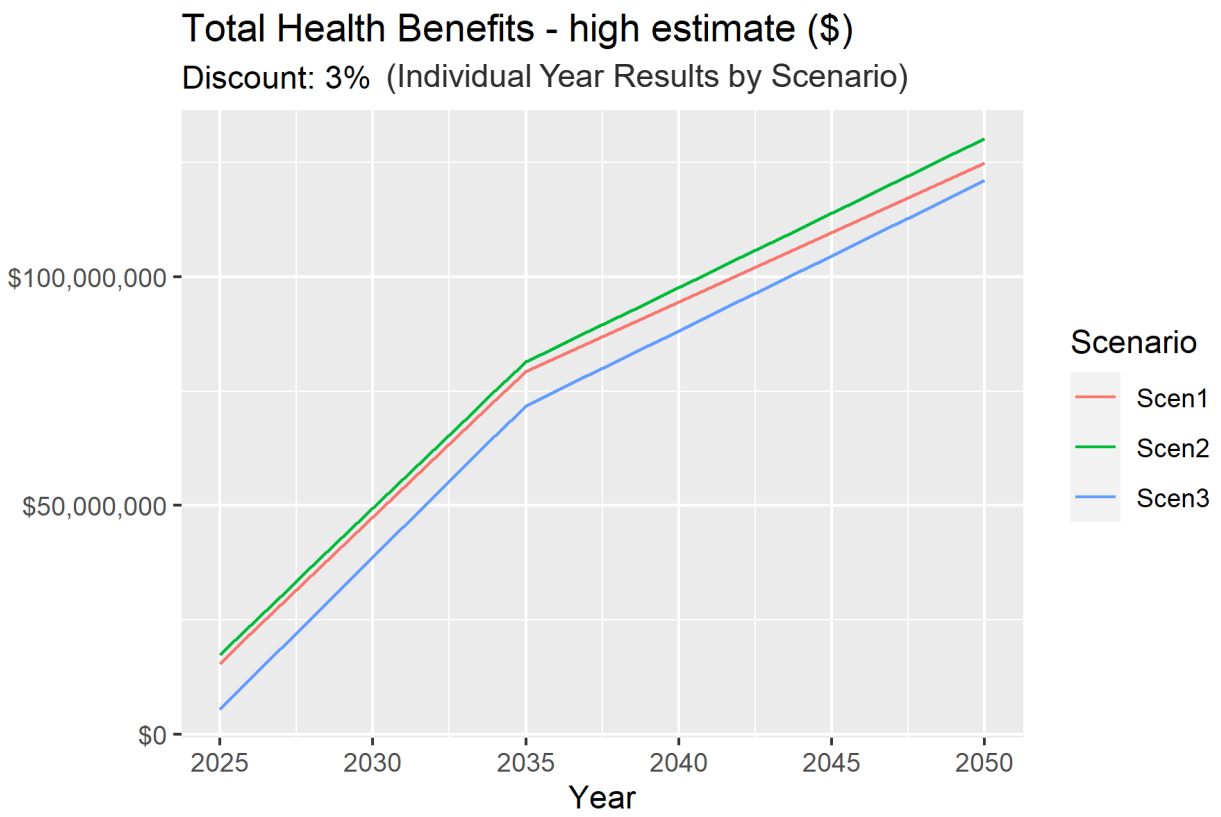
Health Modeling Assumptions & Data Sources

COBRA Input	Data Source(s)	Years Represented	Description of Data	Data Management
Health effect functions	U.S. Environmental Protection Agency (EPA)	All	Functions representing the relationship between PM and adverse human health effects; based on peer-reviewed studies	N/A
Reference health incidence	Oregon Health Authority (OHA)	2016-2019	County- and state-level age-specific counts of incidences of adverse health effects[a]	Supplemented with Census Bureau population data to obtain incidence rates (counts per total population). Some county-level data suppressed. We filled based on state-level incidences.
Reference health incidence	U.S. Environmental Protection Agency (EPA)	2014; 2025, 2035, and 2050 for mortality incidence	COBRA default incidence (2014) supplemented with mortality incidence projections from EPA's BenMAP-CE[b] model	Appended to reference health incidence data from OHA.
Valuation	ICF analysis	2025, 2035, and 2050	Value of a statistical life and willingness-to-pay valuation metrics projected to future years based on income elasticity estimates	To value reduced mortality, we project the 1990 U.S. EPA value of a statistical life and COBRA default willingness to pay to avoid mild illnesses to future years.[c]
Population	Portland State University and Metro	2025, 2035, and 2050	County level population forecast for every 5 years for all counties except Multnomah from PSU and district-level forecasts for Multnomah County from Metro for 2020, 2030, 2045, and 2050	Interpolated between known Multnomah County population estimates to obtain 2025 and 2035 data. To obtain single-year ages based on this data, we apportioned county-level totals using 2023 default COBRA single-year population data in conjunction with BenMAP-CE[b] model age 0-64 and age 65-99 population data.

Notes:
(a) OHA was able to provide county-specific counts of the following health endpoints: asthma emergency department visits, non-fatal myocardial infarctions, all cardiovascular illnesses, all respiratory illnesses, hospital visits for asthma, and chronic lung disease. We use COBRA default incidence data for work loss days and acute bronchitis and we use mortality incidence datasets from BenMAP for years 2025, 2035, and 2050.
(b) Environmental Benefits Mapping and Analysis Program - Community Edition.
(c) Projections based on income elasticity estimates detailed in EPA's BenMAP-CE model and historical GDP and projected GDP from Organisation for Economic Co-operation and Development (OECD).

Health Results
Monetized Values, All Scenarios, All Outcomes by Year

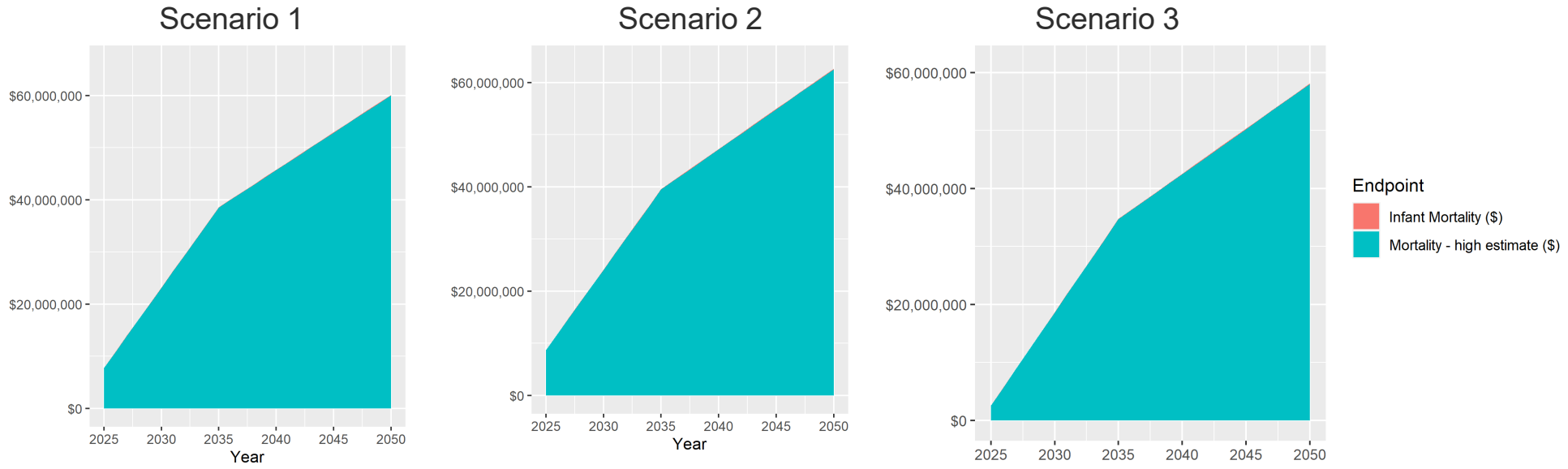
- Shown are $ total state-wide health benefits by year for the 3 modeled years (high estimates,[1] 2020$, discounted to the start of the evaluation period (2022) at a 3% rate.[2])
- Roughly half the monetized avoided health costs are attributable to avoided mortality.
- Reduced incidence of heart attacks and hospital admissions are the leading contributors to avoided morbidity costs.
- Little relative difference is scenarios, but Scenario 2 has the highest health benefits



[1]High estimate reflects health impact functions for mortality and non-fatal heart attacks that result in larger benefits
[2]The discount rate expresses future economic values in present terms. Not all health effects and associated economic values occur in the year of analysis.

Health Results Mortality Cost Drill Down

Total Monetized Benefits by Year, Mortality, Discount = 3%, 2020$ (high estimates)



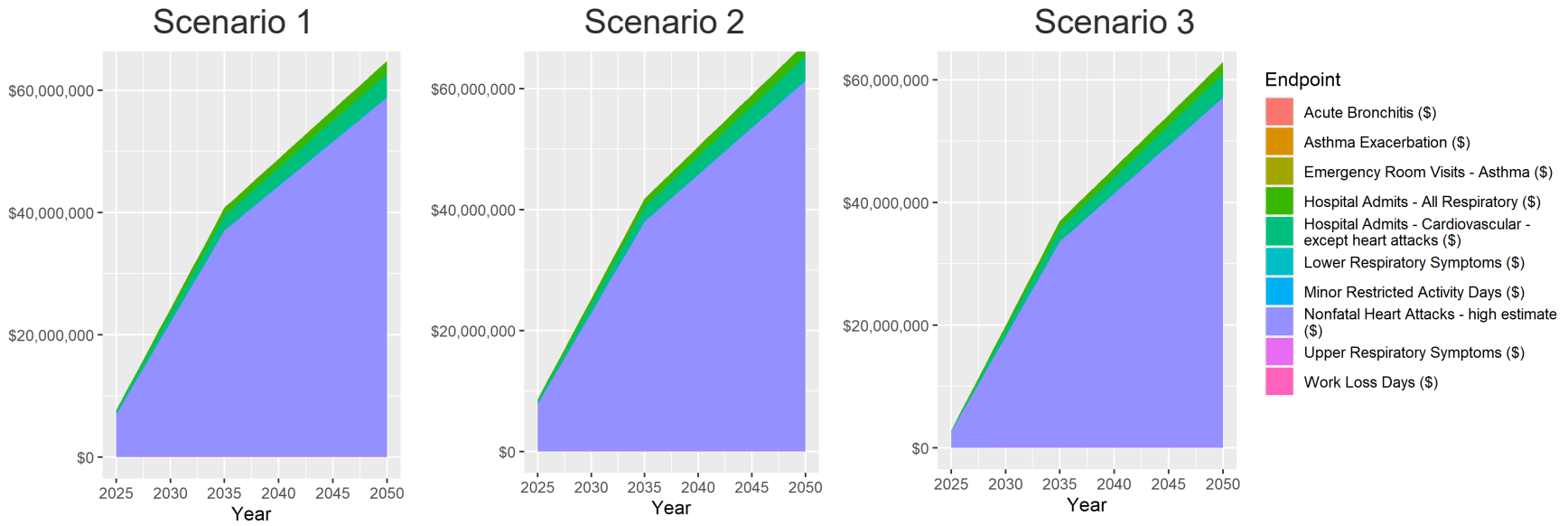
Cumulative avoided deaths and corresponding mortality valuation over the life of the program [1]

Scenario 1	Scenario 2	Scenario 3
166	172	153
$1.01B	$1.05B	$0.916B

[1] Integrated from 2025-2050. Assumes linear trend between modeled years and no savings before 2025. Considers both adult and infant mortalities.

Health Results Morbidity Cost Drill Down by Endpoint

Total Monetized Benefits by Year, Morbidity (all effects), Discount = 3%, 2020$ (high estimates)



Cumulative avoided morbidity benefit valuation over the life of the program[1]:

Scenario 1	Scenario 2	Scenario 3
$1.07B	$1.11B	$0.984B

[1] Integrated from 2025-2050. Assumes linear trend between modeled years and no savings before 2025. Considers all non-mortality endpoints.

Health Results Summary

- All Scenarios show significant reduction statewide in adverse health impacts, with relative small differences
- Due to changes in criteria pollutant emissions from all modeled sectors statewide, including on-road mobile sources, electricity generation, and other sources.
- For example Scenario 2 statewide results: 170 mortalities and monetized values of $2.16B (2020$)
  - Due to reduced exposure to air pollution from 2025-2050 may be avoided statewide due to the program[1,2,3]
  - The increase in the number of avoided health effects during 2035-2050 is larger compared to the increase during 2025-2035. However, the slope of monetized benefits is flatter during 2035-2050 compared to 2025-2035. This is due to discounting monetary benefits. In fact, monetized benefits with a more conservative 7% discount rate are higher in 2035 than in 2050.

[1] High estimates, monetized at 3% discount. All monetary values discounted to 2022.
[2] Our approach to allocating emissions to COBRA values by county and source's "stack height" preferred preserving all emissions over preserving default county stack heights. A sensitivity analysis showed the latter could increase benefits very modestly (<1.5%).
[3] COBRA valuation component aims to monetize public health benefits, not calculate healthcare cost savings. Many endpoints (e.g., mortality, acute bronchitis) are valued using non-market valuation based on willingness to pay (WTP) estimates. Endpoints for which WTP is not available, valuation is approximated using healthcare cost savings and lost productivity. The valuation estimates represent an approximate value residents of Oregon would place on avoiding the statistical cases of characterized endpoints; these estimates are not comparable with market impact estimates generated by the economic analysis component.

Economic

Results for initial three policy scenarios

Economic Analysis Overview & Data Sources

- Economic analysis conducted using the IMPLAN economic model
- IMPLAN analyzes regional economic effects of policy scenarios on a single, pre-specified region
  - Model used here is for the entire state of Oregon
  - Data vintage: 2019
- Results are typically report in terms of common economic metrics
  - Jobs/employment impacts
  - Gross State Product (GSP)
  - Labor Income
- Monetary values reported in 2021$

Economic Analysis Overview & Data Sources

- Three primary types of impacts (multipliers) used in IMPLAN
  - **Direct**: Construction employment, direct procurement of materials, equipment rentals, etc.
  - **Indirect**: Supply-chain inputs such as supplies, parts, materials, third-party services, etc.
  - **Induced**: Increased consumption spending on housing, healthcare, goods and services, etc.
- Total impact is the sum of multiple rounds of secondary indirect and induced impacts that remain in the region
  - Accounting for shifts to other regions or states
  - IMPLAN then uses this total impact to calculate subsequent impacts

Economic Analysis Methodology

- Positive economic impacts associated with investments in various clean energy options that affect various industries
  - Energy efficiency, electrification, and electric vehicle adoption
- Long-term, these investments lead to energy savings for OR residents
- Negative economic impacts associated with sectors bearing losses
  - Mostly fossil fuel related sectors
- Modeling also accounts for budgetary implications of the investments
  - Assuming limited resources (for businesses) and budget constraints (for households)
- Modeling results provide a holistic picture of total impacts

Economic Analysis Data Inputs

- Main modeling inputs used in IMPLAN include
  - Investments in energy efficiency
  - Investments in electrification
  - Changes in consumer bills
  - Impacts on energy producing sectors
    - Positive impacts of electrification
    - Negative impacts on fossil fuel
  - Budgetary impacts of investments on OR residents and businesses

Economic Results Considerations

- Economic modeling distinguishes between gross and net changes
- Gross impacts represent the economic benefits derived from the various clean energy investments
- Net impacts factor in the costs of making those investments

Economic Results Overview

- Results presented today are for net impacts
- Economic results do not incorporate CCI investments or the previously discussed monetized health benefits
- All three scenarios show very little overall economic change
- Drivers of results in modeled years (2025, 2035, 2050)
  - Investments in clean transportation, which expands both consumer bill savings and fossil sector impacts
    - Clean transportation investments are the largest driver of impacts in 2035 and even larger driver in 2050
  - Electrification and energy efficiency investments

Results: Employment

- Net job changes are small, but negative
  - Driven by fossil sector impacts and opportunity costs of investment
  - Positive job impacts driven by electrification and clean transportation investments as well as bill savings
- Changes are small, ranging from -0.44% to -0.07% of total workforce

	Scenario 1			Scenario 2			Scenario 3		
	2025	2035	2050	2025	2035	2050	2025	2035	2050
Direct	(8,400)	(10,100)	(4,000)	(6,600)	(6,800)	(3,300)	(6,600)	(6,800)	(4,700)
Indirect	(1,500)	(2,800)	(1,750)	(1,000)	(1,900)	(1,700)	(1,000)	(1,900)	(1,800)
Induced	(1,100)	150	2,200	(1,500)	(200)	2,700	(1,500)	(200)	2,100
Total	**(11,000)**	**(12,750)**	**(3,550)**	**(9,100)**	**(8,900)**	**(2,300)**	**(9,100)**	**(8,900)**	**(4,400)**

Results: GSP (2035 & 2050)

- Net GSP are small but positive generally, especially in the long run
  - Investments and bill savings have larger positive impacts than opportunity costs have negative impacts

Impact	Scenario 1		Scenario 2		Scenario 3	
($ Million)	2035	2050	2035	2050	2035	2050
Direct	(180)	270	230	360	230	290
Indirect	(180)	(70)	(40)	(50)	(40)	(60)
Induced	20	210	(20)	250	(20)	200
Total	**(340)**	**410**	**170**	**560**	**170**	**430**

Results: Income (2035 & 2050)

- Net total income changes are small, but lower early and trend upward in later years
  - Scenario 2 ends up with higher net income by 2050
  - Results driven by bill changes from energy and fuel consumption
  - Over time, consumers save money on energy bills and those accumulated savings compensate other losses

Impact	Scenario 1		Scenario 2		Scenario 3	
($ Million)	2035	2050	2035	2050	2035	2050
Direct	(380)	(60)	(150)	(2)	(150)	(70)
Indirect	(170)	(110)	(100)	(110)	(100)	(110)
Induced	10	110	(10)	140	(10)	110
Total	**(540)**	**(60)**	**(260)**	**30**	**(260)**	**(70)**

Results: Key Considerations

- Overall, small changes to economy, but positive for GSP and income while small overall job impacts are well less than 1% of baseline jobs
- Significant investments in clean transportation, followed by smaller investments in energy efficiency, and electrification
  - Early investments in light-duty EVs, switching to mix of LD/MD/HD by 2050
- Investments in clean energy resources and increasing energy savings drive positive trends
- Construction and manufacturing sectors see job gains
  - Mostly due to installation of EE equipment and electrification measures
- Trade and transportation sectors see job losses
  - Mostly driven by changes in the fueling infrastructure as well as reduced repair and maintenance demand

Co-benefits and Equity

Results for initial three policy scenarios

Co-Benefits and Equity Analysis: Overview

- **Objective:** For each scenario, assess potential **co-benefits** and positive or negative impacts to **equity**
- **Approach:**
  - **Qualitative assessment** of policy scenarios against identified indicators.
  - **Two assessments:**
    - Co-benefits: *Overall* scenario co-benefits (or damages)
    - Equity: *Distribution* of benefits (or damages) among communities of concern
  - **Five indicators:**
    - Local air quality (health)
    - Ecosystem health & resilience
    - Housing burden
    - Energy security
    - Employment & workforce development

Co-Benefits and Equity Analysis: Methodology

- **Communities of concern:**
  - Communities of color
  - Tribal Nations
  - Elderly populations
  - Low-income urban communities
  - Low-income rural communities
- **Qualitative rankings:**

1	**Negative**	The policy will have a *significant negative effect* on associated indicators.
2	**Slightly Negative**	The policy will have a *modest negative effect* on associated indicators.
3	**Neutral**	The policy will not have a *net neutral effect* for associated indicators.
4	**Slightly Positive**	The policy will have a *modest positive effect* on associated indicators.
5	**Positive**	The policy will have a *significant positive effect* on associated indicators.

- **Key information sources:**
  - Health & economic analysis
  - Academic literature & white papers specific to the indicators

Co-Benefits and Equity Analysis: Key Assumptions/Considerations

- **Timeframe:** Cumulative to 2050, with consideration of potential near-term impacts.
- **External variables:** Constant environmental & economic conditions across scenarios (e.g., climate change).
- **Geographic differentiation:** Co-benefit rankings reflect generalization across state/community.
- **Overlapping communities:** Does not take into account compounding effects of community overlap (e.g., elderly, low-income person of color).
- **CCIs:** Assumed CCIs include funding for transit expansion/electrification; home electrification; energy efficiency improvements; freight fleet conversion.

Co-Benefits Analysis Results

- Assessment indicates that all policy scenarios will see increased co-benefits over reference case
- Highest benefits around public and ecosystem health
- Housing burden benefits are mixed depending on policy scenario
- Key differentiators are GHG reductions, compliance flexibility options, and use of CCIs

Indicator	Reference Case	Scenario 1	Scenario 2	Scenario 3
Local air quality	2.5	4	4	3.5
Ecosystem health & resilience	3	4	4	3.5
Energy security	2	4	3	4
Employment & workforce development	2.5	3	3.5	3
Housing burden	2	2.5	1.5	2.5
TOTAL SCORE	**12**	**17.5**	**16**	**16.5**

Equity Analysis Results

Indicator Category	Indicator	Reference Case (Total = 50.5)					Scenario 1 (Total = 76)				
		CoC	Tribes	Urban low-income	Rural low-income	Elderly	CoC	Tribes	Urban low-income	Rural low-income	Elderly
Health	Air quality	2	2.5	2	2.5	2	4	4	4.5	4	3.5
Environmental	Ecosystem health & resilience	2	2	2	2	2	4	4	4.5	4	4
Economic	Energy security	2	1.5	2	1.5	1.5	2.5	2	2.5	2	2.5
	Employment & workforce development	2	2	2	2	1	2.5	2.5	3	3	1
Social	Housing burden	2.5	2.5	2	2.5	2.5	2.5	2.5	2	2.5	2.5
	Total Score	**10.5**	**10.5**	**10**	**10.5**	**9**	**15.5**	**15**	**16.5**	**15.5**	**13.5**

Indicator Category	Indicator	Scenario 2 (Total = 72)					Scenario 3 (Total = 71.5)				
		CoC	Tribes	Urban low-income	Rural low-income	Elderly	CoC	Tribes	Urban low-income	Rural low-income	Elderly
Health	Air quality	4	3.5	4	3.5	3.5	3.5	3	3.5	3	3
Environmental	Ecosystem health & resilience	4.5	3.5	4.5	3.5	3.5	3.5	3	3.5	3	3
Economic	Energy security	2	1.5	2	1.5	2	3	2.5	3	2.5	3
	Employment & workforce development	3	3	3.5	3.5	1	3	3	3	3	1
Social	Housing burden	2	2.5	1.5	2.5	2.5	2.5	3	2	2.5	2.5
	Total Score	**15.5**	**14**	**15.5**	**14.5**	**12.5**	**15.5**	**14.5**	**15**	**14**	**12.5**

Equity Analysis Results

- Overall, all policy scenarios are projected to benefit identified communities of concern as compared to the reference case
- Compared to other communities of concern:
  - Urban low-income households and communities of color experience the most benefits
    - Drivers of this include benefits from the use of CCIs and health improvements associated with GHG reductions from regulated sectors
  - Elderly populations experience the fewest benefits
- Key policy scenario drivers of outcomes include:
  - Type and extent of regulated sectors
  - Allowance of compliance flexibility options like banking and CCIs
  - Associated distribution of impacts across geographies and communities

Co-benefits Equity Results

- All policy scenarios create benefits compared to reference case
  - Significant statement reduction in adverse health impacts
  - Positive co-benefits and equity benefits
- Highest co-benefits around ecosystem and public health
- Housing burden will be important to monitor
- GHG reduction, CCIs and other compliance flexibility play an important role in equity and co-benefits
- Equity benefits from CCIs will rely on targeting areas with communities of concern and GHG and other air pollutant emissions

DEQ Initial Reflections on Modeling

- *Three program goals: achieving significant emissions reductions, containing costs, promoting benefits and alleviating burdens for EJ and impacted communities*
- This is achievable
- Can result in dramatic reductions in emissions while maintaining the overall health of Oregon's economy
- Can improve public health across Oregon by reducing emissions
  - Important for our environmental justice communities already disproportionately exposed to air pollution
- Can be designed to promote equity
  - Program features like CCIs can further support and engage environmental justice communities in the transition to a low-carbon future

RAC #4 Agenda

Time	Topic
9 a.m.	Welcome
9:05 a.m.	Meeting ground rules, procedures for public comment
9:15 a.m.	Remarks by Director Whitman
9:30 a.m.	Review committee work plan and upcoming meetings
9:45 a.m.	Regulation of stationary source emissions
11 a.m.	Break
11:15 a.m.	Further considerations for community climate investments
12 p.m.	Public comment period #1
12:15 p.m.	Lunch
12:45 p.m.	Initial modeling policy scenarios results review and discussion
2:15 p.m.	Break
2:30 p.m.	**Discussion of fourth modeling policy scenario**
3 p.m.	Identifying covered entities and compliance instrument distribution for fuels sectors
4:10 p.m.	Next steps
4:10 p.m.	Public comment period #2
4:30 p.m.	Adjourn meeting

Considerations for 4th Scenario Assumptions

- Inform overall design and relationships between design elements and the program goals through directionality and magnitude of changes
- Changes to a few assumptions may be most helpful in determining what is driving change from first three scenarios
- Analyze program options that do **not represent final or complete program design proposals**
  - Not able to represent all details in modeling
  - Often include simplifying assumptions for modeling
- More nuanced results due to more detailed analysis in some areas
  - Health study and co-benefits/equity assessment

Proposed Assumptions for 4th Policy Scenario

Key Topic	Policy Scenario 4	Rationale for DEQ Proposed Assumptions
Cap Application	One cap applied across regulated sectors using 2010 data for baseline with cap beginning in 2022	Keep assumption consistent across all scenarios where possible
Cap and Trajectory	45% by 2035 80% by 2050	Better understand why Scenario 2 was the scenario with the most emissions above the cap.
Trading Allowed?	Yes; across sectors	Played little role in modeling, but consistent assumptions helps to isolate any interactions between potential CCI and banking changes
Banking Allowed?	Yes; unlimited through time	Played a significant role to date in modeling. Propose to keep assumptions consistent across all scenarios
Allowable Use of Community Climate Investments (CCIs)	Up to 20% of compliance obligation per year	CCI usage was either 5% or 25% Due to role played by CCIs in modeling would to better understand a different allowable usage %;
CCI Price	EPA Social Cost of Carbon using a 2.5% discount rate (starts at $76 and increases to $116 in 2020$)	Keep assumption consistent across all scenarios where possible

Proposed Assumptions for 4th Policy Scenario

Key Topic	Policy Scenario 4	Rationale for DEQ Proposed Assumptions
Regulated Sectors	- Natural gas utilities - Non-natural gas fossil fuel suppliers	Consistent with Scenarios 1 and 2 because a threshold applied to fuels suppliers was not found to significantly influence emissions scopes or results in the modeling
Regulated Sector not captured in the modeling	- Large stationary sources with relevant emissions >25,000 for emissions not regulated above	Not reflected in the study due to modeling limitations
Sector Exclusions	- Natural gas supplied by interstate pipeline companies regulated at stationary sources if relevant emissions are above threshold - Fuels used for aviation - Landfills; Electric Generators; stationary sources with relevant emissions below threshold	Keep assumptions consistent across all scenarios where possible. Aligns with Scenarios 1-3 in part
Expanded Complementary Policies	Clean Fuels Program assumed to expand from current 10% by 2025 target to 25% by 2035*	Keep assumption consistency across all scenarios where possible

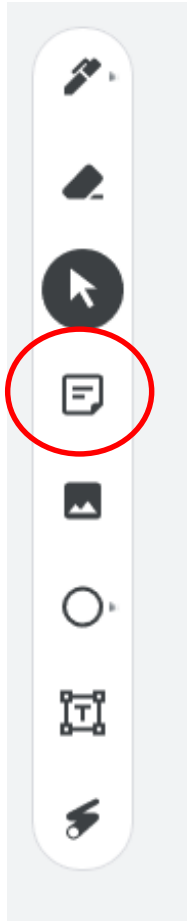
*DEQ intends to open a rulemaking in 2021 to develop expanded Clean Fuels Program targets

Proposed Next Steps on Modeling

- Upcoming Modeling Q&A session with ICF
  - April 28, 2021, 9 to 11 a.m. PT
  - Opportunity to learn more about the modeling assumptions and results
- Release additional materials on initial policy scenarios
- Review results of all 4 scenarios at future RAC meetings
- Use results to help inform the fiscal impacts analysis

Discussion Questions

- RAC members invited to provide comment using interactive online tool – click on link provided in chat
- Use “sticky note” tool by clicking on icon on left-hand side
- Type your comment in the sticky note
- Add your comment in response to any of the following questions for policy scenario 4:
  - What are your thoughts on the cap trajectory?
  - What are your thoughts on the assumptions on who is regulated/regulated sectors?
  - What are your thoughts on the allowable percentage of Community Climate Investments (CCIs)?
  - Any other comments?



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Non-Natural Gas Fuel Supplier Considerations

- Non-natural gas fuel suppliers
  - 6 to 80 entities depending on threshold
  - Point of regulation for liquid fuels and propane emissions
- High annual variability in emissions
- Regardless of threshold, variability in how many compliance instruments each entity needs
  - DEQ needs a predictable method for distributing compliance instruments
- Lower threshold
  - Slightly more emissions
  - More variability in which entities are above the threshold (and regulated) each year

Fuel Supplier Emissions

2019: 24.1 Million MT CO_2e
84 suppliers

Threshold MT CO_2e	Share of Fuel Sector Emissions	Count of Suppliers
5,000	99.8%	58
25,000	99%	38
300,000	86%	6

Example for Determining Covered Fuel Suppliers

- DEQ could reduce variability with a multi-year analysis of which entities are above the threshold
  - Entities could trigger the regulations if they meet or exceed the threshold in any year, on average, etc.
  - Entities who exceed the threshold could be regulated for the next compliance period, multiple compliance periods, or indefinitely

Example evaluation cycle

Emissions years for evaluation period	Year in which evaluation occurs to determine if entity is covered	Applicable compliance periods for which entity becomes a covered fuel supplier (both periods):	
		First period	Second period
2017-2019	2021	2022-2024	2025-2027
2020-2022	2024	2025-2027	2028-2030
2023-2025	2027	2028-2030	2031-2033
Each subsequent three-year period	Every third year (the year prior to the start of a new compliance period)	Each subsequent three-year period	Each subsequent three-year period

Example Structure to Determine Covered Fuel Suppliers

- Entities to which this approach applies
  - Non-natural gas fuel suppliers because only three natural gas utilities to regulate
- Frequency of determining entities above threshold
  - Longer time between evaluations means more clarity about who is covered (which affects compliance instrument distribution), but means slower adjustment to longer-term changes
  - DEQ not likely to make evaluation more than once per compliance period
- Determining which years to use for evaluation
  - Older emissions may not represent present or upcoming emissions
  - More recent emissions data may not be available with sufficient time for entities to plan for compliance

Example for Compliance Instrument Distribution

- DEQ will likely distribute compliance instruments based reported emissions.
  - For example, an entity that reported 1 percent of total covered emissions under the program may receive 1 percent of compliance instruments.
- Less change in who is a covered entity means DEQ could also provide more certainty about how many compliance instruments each entity will receive.
  - DEQ could re-calculate each entity's percent once per compliance period.

Example evaluation cycle

Emissions years for evaluation period	Year in which evaluation occurs to determine distribution of compliance instruments	Compliance period for which the determined distribution methodology applies
2017-2019	2021	2022-2024
2020-2022	2024	2025-2027
2023-2025	2027	2028-2030
Each subsequent three-year period	Every third year (the year prior to the start of a new compliance period)	Each subsequent three-year period

Example Structure for Compliance Instrument Distribution

- Evaluation period
  - Could use the same period and data years as are used for evaluating covered entities
  - Historically reported emissions: available before compliance period begins, but may not correspond to current emissions
  - Emissions from the compliance period: Will correspond to entities' compliance obligations, but:
    - Distribution could not occur until after reporting (less certainty during compliance period)
    - May mean entities are hesitant to reduce emissions and reduce their share

Example Structure for Compliance Instrument Distribution

- Calculation of proportional covered entities' share of cap/compliance instruments
  - Percentage of total emissions may not work well for all entities
    - For example, small changes at program scale may be big changes for individual, smaller fuel suppliers
    - Need to determine percentages and when to update percentages
  - DEQ could group entities (by sector, range of emissions, or other category) and distribute a percentage of compliance instruments to the group, divided proportionally among entities
    - This may limit variability within each group

Questions and Feedback

1. How often should DEQ evaluate who is above the program threshold?
   a. How many years of historical emissions data should be used in an evaluation?
   b. For how many years or compliance periods should entities be covered based on evaluation of historical emissions data?

Questions and Feedback

2. What are the advantages and disadvantages of using an evaluation cycle to determine distribution of compliance instruments?
    a. What tradeoffs are important to you when considering using historical or more current emissions data, relative to a compliance period?
    b. Should the evaluation cycle align with determination of applicability? Why or why not?
    c. Should DEQ establish specific percentages of compliance instruments to distribute to groups of entities? Why or why not?

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Next Steps: Written Comments

- DEQ accepting written comment on today's discussion items
- Please submit comments by end of day **April 30, 2021** to GHGCR2021@deq.state.or.us
- Upcoming Modeling Q&A session
  - **April 28, 2021, 9 to 11 a.m. PT**
- Next rulemaking advisory committee meeting (#5)
  - **May 25, 2021, 9 a.m. to 4:30 p.m. PT**

RAC Meeting Resources

Sign up for meeting notifications:
https://public.govdelivery.com/accounts/ORDEQ/subscriber/new?topic_id=ORDEQ_655

Rulemaking webpage:
www.oregon.gov/deq/Regulations/rulemaking/Pages/rghgcr2021.aspx

Rulemaking contact:
GHGCR2021@deq.state.or.us

Modeling study webpage:
www.oregon.gov/deq/ghgp/Pages/modelingstudy.aspx

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Public Comment Period

- Public comment period: 4:10 – 4:30 p.m.
- Raise your hand if you'd like to make a comment
- When making public comments, please:
  - Respect time limits as assigned
  - Use respectful language
  - Address issues and questions—focus on substance
  - When possible, relate comments to topics on the RAC agenda
- Members of the public welcome to provide written input to GHGCR2021@deq.state.or.us by April 30