Introduction

The latest report from the Intergovernmental Panel on Climate Change gives our civilization less than 12 years to cut greenhouse gas emissions by 45% below 2010 levels to have a chance of keeping warming below 1.5°C Celsius. In 2019, Oregon is poised to pass legislation to establish a cap and invest system for regulating greenhouse gas emissions (GHGs) statewide to help advance this global goal. The legislation has been commonly referred to as the Clean Energy Jobs (CEJ) bill. The most likely scenario is for the state’s CEJ program to be in line with California’s cap and trade bill, otherwise known as Assembly Bill 32, or AB32.

While CEJ’s proposed cap and invest (a variant of cap and trade) program is viewed as an important step forward, it is far from a comprehensive climate solution because (1) it leaves out many sources of GHG emissions; (2) it does little to scale up the natural climate solutions scientists are urging governments across the world to embrace in order to meet the goals set by the Paris Climate Accord; (3) it has limited ability to generate revenues for necessary investments in climate adaptation; (4) it fails to prevent new fossil fuel infrastructure, and (5) it fails to remedy environmental injustices.¹

In the US Congress, Representative Alexandria Ocasio-Cortez (D-NY) has revived the concept of a Green New Deal (GND) as a framework for a comprehensive climate agenda. Other members of Congress and presidential candidates have expressed support for a GND. Polls show the American public overwhelmingly supports a GND as a climate solution. Recently, members of the Oregon Just Transition Alliance have put forth the beginnings of a GND package for the State of Oregon.² This policy brief provides some specific elements of a GND vision for Oregon that legislators could quickly embrace as complementary measures that will work in tandem with, or in lieu of, a cap and invest program for Oregon.

Cap and trade must be supplemented with complementary measures

Across the US, 11 states and several Canadian provinces have adopted or begun planning for some variation on a cap and trade program. Yet in none of these locations is cap and trade expected to be the only, or even the most important, regulatory framework for reducing GHG emissions or adapting to climate change.

![Figure 1: In California, 62% of emissions reductions through 2030 are expected to come from complementary measures.](image)

² Figure 1: In California, 62% of emissions reductions through 2030 are expected to come from complementary measures.
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California’s experience is illustrative. Figure 1 displays the cumulative emissions reductions anticipated through 2030. The majority (62%) of emissions reductions is expected to come from a suite of complementary measures to limit methane and other high potency gases, improve energy efficiency, increase use of biofuels and scale up renewable energy. While cap and trade is expected to bear 38% of the emissions reduction burden, if current trends continue, the majority of these claimed ‘reductions’ may come from offset projects that are replete with uncertainties and perverse incentives that undermine their legitimacy.

In Oregon, complementary measures already being advanced include clean fuel standards, a phaseout of coal-based electricity, a renewable portfolio standard, a zero-emissions vehicle standard and energy efficiency standards for vehicles and appliances. But given the urgency of climate change, the suite of complementary measures could be far more expansive and more immediate. The following sections discuss eleven options that have been advanced by scientists and community organizations as part of the GND frame and are responsive to the unique climate policy opportunities that exist in the State of Oregon.

1. No new fossil fuel infrastructure

A recent scientific assessment suggests that we have a 64% chance of containing global mean temperature rise to under 1.5°C if carbon-intensive infrastructure is phased out at the end of its design lifetime from the end of 2018. In practice, this means that we must prevent all new fossil fuel infrastructure and drastically reduce current carbon emissions just to have a fighting shot at avoiding the worst impacts of climate change. States and cities are leading the way in response to this challenge.

In 2016, Portland enacted the nation’s most comprehensive ban on new fossil fuel infrastructure through its Fossil Fuel Terminal Zoning Amendments. In Washington State, King County has recently followed suit by instituting a six-month moratorium on all new fossil fuel infrastructure while it explores a long-term prohibition of its own. In 2015, the states of South Carolina and Georgia imposed moratoria on the use of eminent domain for new oil and gas pipelines, which ultimately led to the defeat of the Kinder Morgan Palmetto Pipeline. In addition, US Senator Jeff Merkley inserted a moratorium on major fossil fuel projects starting in 2021 in his 2017 ‘100 by 50’ bill. An Oregon bill based on this language has been drafted and could be a central feature of a GND package for the state.

In its current form, however, CEJ is silent on the issue of new fossil fuel infrastructure. And because of this, major new fossil fuel facilities could be constructed in Oregon and seriously undermine any emissions reduction goals the state achieves through CEJ programs. The proposed Pacific Coast Connector Pipeline and Jordan Cove liquified natural gas (LNG) facility is a case in point. In January 2018, a report found that the lifecycle GHG emissions from Jordan Cove LNG and the Pacific Connector Pipeline would be 36.8 million metric tons carbon dioxide equivalent per year (MMTCO₂e/yr), which is over 15 times the 2016 emissions from the retiring Boardman coal plant, Oregon’s current largest carbon polluting facility.
As written, the proposed CEJ bill would do nothing to prevent this pipeline and terminal from being constructed nor would it restrict other new fossil fuel projects. In addition, the bill’s accounting methodology would, in the best-case scenario, leave roughly 95% of lifecycle emissions for the Jordan Cove project unaccounted for. In other words, the CEJ bill is mostly silent on what would be the single largest climate polluting project in the history of the state. This underscores the imperative of including no new fossil fuel infrastructure policies as part of the GND package.

2. Polluter pays policies for climate damages

Climate change is already exacting major economic costs on federal, state, and local governments and the economy as a whole. By polluters who are making a profit while causing climate change.

The ‘polluter pays’ principle is a bedrock principle of US environmental law and has received strong support from the European Union and other governments. It is an efficient and logical market principle that ensures that market signals for bad behavior are internalized within the offending party’s financial accounts. Application of this principle to climate polluters is long overdue. The most direct path toward embracing polluter pays is a carbon tax. However, this approach has been rejected for now, at least in terms of regulating emissions from the sectors being folded into Oregon’s evolving cap and invest program. But nothing in the proposed cap and invest program precludes carbon taxes or fees as an option for activities excluded. For example, model forest carbon tax and reward legislation has already been drafted to regulate emissions from industrial forest practices.7

Figure 2: Fossil fuel risk bond programs are one option state and local governments have for offsetting the costs of catastrophic wildfires and other climate disasters as well as the risks associated with fossil fuel infrastructure.
For the fossil fuel industry in Oregon, another approach that can work in tandem with cap and invest is Fossil Fuel Risk Bond (FFRB) programs, which can be enacted statewide or by local jurisdictions.8 FFRB programs operationalize the polluter pays principle through two major mechanisms: (1) financial assurance mechanisms, like surety bonds, to protect public coffers from the costs of oil train derailments, catastrophic explosions and spills, abandoned infrastructure and other risks that now are shouldered by taxpayers as well as health and safety risks which are absorbed by nearby ‘fenceline’ communities, and; (2) surcharge based fossil fuel risk trust funds (FFRTFs) to offset public financial costs of climate change, climate adaptation, and climate mitigation. Unlike a carbon tax, which in Oregon would go into a general revenue program, the surcharge is designed to offset specific public costs and so may avoid Oregon’s constitutional requirements that would otherwise require such funds to be used for highways.

Climate impact fees represent another option. For example, a fee on lifecycle emissions associated with large new homes on the urban fringe inaccessible to public transit or hobby SUVs and pickups with poor fuel efficiency could become the basis for a polluter pays fee on goods and behavior we should discourage in a carbon-constrained world. These fees can build upon other point of sale fees and surcharges already in existence to minimize any additional administrative costs for the state or local governments. Regardless, carbon taxes on sectors not regulated by the cap and invest program, FFRB programs, and impact fees are a few of the many examples of policies Oregon can enact to shift the cost burden of climate change back onto the fossil fuel industry and other GHG polluters and help reduce what will otherwise be an ever-increasing cost borne by taxpayers.

3. Climate resilient workforce

The reality of climate change will force Oregon’s workforce to adapt. A changing climate means many jobs are vulnerable to changes in sea levels, rainfall patterns, and rising temperatures. In addition, jobs associated with the fossil fuel industry, non-renewable electric utilities or conventional logging and agricultural practices will need to be repurposed as part of a just transition to a green, climate resilient economy based on renewable energy, public transit, green infrastructure, energy efficiency, and climate smart forestry and agricultural practices.

Fortunately, the transition to a climate resilient economy will create many new jobs. According to Sightline Institute, the job creation potential of the investments needed to make this transition happen is substantial (Figure 3). But Oregon’s workforce will need training in order to take advantage of these investments and obviate the need to bring in expertise from out of state.

The workers of the future will need to be skilled in regenerative agricultural practices and know how to harvest timber while leaving a climate resilient forest behind. Oregon will need workers to help...
build and restore the kinds of infrastructure that can withstand intense storms, sea level rise, floods and droughts, while enhancing and protecting our ‘green infrastructure’- the forests, soils, and natural water filtration mechanisms that can help Oregonians stay healthy while protecting and restoring ecosystem functions and biodiversity.

The new green economy should prioritize the training of workers from low-income communities, rural areas, and communities of color - those who have borne the brunt of climate change or who risk most in the transition away from industries that destabilize the climate. Unions have a critical role to play in both organizing and retraining the workers of the future, and as such, any GND package needs to include provisions that ensure collective bargaining and decision-making.

In order to finance such an ambitious agenda, a GND for the United States must start with taxes that help narrow the inequality divide from its current historic heights. In Oregon, it must include fair, progressive property and corporate income tax reforms that increase general fund revenues. And those industries most responsible for the climate crisis must pay for the cleanup and restoration of our atmosphere, our rivers, and our farm and forest lands.

Other innovative approaches proposed in Oregon to generate funds for this economic transformation include green bonds, or fossil fuel risk bond programs as noted above, and public banks to ensure that the revenue and interest charged from these projects is recycled and reused within the public realm, for the public good.

4. Monitor and regulate all GHG emissions

The scope of emissions addressed by Oregon’s evolving cap and invest program is quite limited – both in terms of the sources of emissions regulated and the methods used to count them. There are two general categories of emissions associated with Oregon’s economy: sector-based, or production associated emissions and consumption-related emissions based on the embodied carbon in the goods and services people purchase. Sector based emissions are estimated to be about 64 MMTCO₂/yr while consumption related emissions are just shy of 89 MMTCO₂/yr.9

Cap and trade programs are limited to the former, but there is no reason why emissions associated with consumption of goods and services cannot be regulated in the same manner - for example, by including major groceries and wholesale lumber yards as regulated entities based on the carbon embodied in their products. Policies for adding these emissions to the regulatory framework have been well researched.10 Doing so would encourage the transformation of high carbon supply chains to low carbon, climate smart alternatives.

Oregon’s GHG inventory is also limited because it now excludes several important sources of GHG emissions such as those associated with sacrificed sequestration capacity on lands lost to urban development, emissions associated with industrial logging and agriculture operations and emissions associated with combustion of biomass and biofuels.

Another limiting factor is the choice of methods for calculating sector-based emissions. The gold
standard is the life cycle analysis (LCA) method, adopted by thousands of businesses worldwide, which accounts for emissions throughout the supply chain from extraction of raw materials to emissions associated with product use, disposal, and decay. As proposed, Oregon’s cap and invest program would use an in-boundary (within state borders only) approach, which leaves out all upstream and downstream associated emissions from goods produced here. Adopting an LCA method for sector emissions would help Oregon develop an international competitive advantage in production of climate smart goods and services that reduce emissions at each stage of a product’s life cycle and provide the market signals necessary for consumers – both public and private – to make more climate friendly purchasing decisions.11

5. Rescind or redirect harmful subsidies

Redirecting or rescinding environmentally harmful subsidies is a key strategy for advancing the sustainable development agenda worldwide.12 In Oregon, there are many subsidies that encourage continued combustion of fossil fuels and continued depletion of our natural carbon sinks with no regard for the deleterious climate change consequences. In some cases, they are so obvious we may overlook them.

For example, Oregon’s constitution requires that all taxes on transportation fuels be placed in the Oregon Highway Trust Fund to maintain and build more highways. Thus, this ‘carbon tax’ of sorts is transformed into a subsidy for more traffic, more urban and suburban sprawl. A wiser approach, one that would require a constitutional amendment, would allow a rising share of these funds to be spent on public transit and high-speed rail to help ease Oregonians out of their cars and into more climate-friendly transportation alternatives.

Other subsidies appear in the form of tax breaks for major polluters. The timber industry is one of the prime recipients, receiving over $300 million a year in tax breaks for practices that are accelerating climate change, damaging our water supplies and driving extinction. Agricultural subsidies are another. Subsidies for the fossil fuel industry are commonplace as well. For example, Oregon Revised Statutes (ORS) 324.070, 324.080 and 324.090 provide tax breaks on oil and gas producers in Oregon. There are a total of 105 permitted wells in Columbia and Coos Counties, though there are no actively producing oil wells in Oregon. The only site in Oregon currently producing natural gas is owned by NW Natural and is in Mist, a small unincorporated community in Columbia County.

“In Oregon, there are many subsidies that encourage continued combustion of fossil fuels and continued depletion of our natural carbon sinks with no regard for the deleterious climate change consequences.”

For reasons of administrative simplicity, states frequently seek to conform many, though rarely all, elements of their tax codes to the federal tax code. Oregon does this in a manner called the ‘rolling reconnect,’ which means that Oregon adopts Internal Revenue Code changes as they occur. Oregon has connected to federal deductions for intangible development costs for fuels, which are intended to encourage the development of petroleum, natural gas, and geothermal wells. Thankfully, these subsidies are not being taken advantage of at this time, given how little fossil fuel exploration there is in Oregon.

Also on the books in Oregon (ORS 2.014 and 2.048) are property tax deductions for pipeline owners - potentially a subsidy to Pembina Pipeline Corporation, which is proposing to build
a 235-mile fracked gas pipeline to Jordan Cove. Furthermore, it’s anticipated the Jordan Cove liquefied natural gas (LNG) exportation facility will be certified for property tax breaks through the Long-Term Rural Enterprise Zones (ORS 285C.409). This represents roughly $100 million per year in avoided taxes - an effective subsidy - for the pipeline and Jordan Cove terminal. Oregonians should not be subsidizing a large Canadian corporation, Pembina, for a polluting, hazardous export project with taxpayer dollars, which are sorely needed for public expenditures elsewhere.

In order to ensure a level playing field for carbon-free energy resources, these and similar tax breaks and subsidies for fossil fuels should be discontinued and shifted to clean, renewable energy and clean, smart transportation and urban planning, while ensuring rural areas are prioritized for electrical vehicle charging stations and renewable energy infrastructure.

6. Halt urban sprawl and highway expansion

The vast automobile-dependent subdivisions and strip malls dominating the urban fringes of Portland, Salem, Eugene, Bend, Medford and many other Oregon communities are major sources of climate damages. Transportation emissions in Oregon are on the rise and are the key reason why the state will likely fail to meet its 2020 climate goals. Every new subdivision and strip mall authorized locks in an increase in both vehicle miles traveled and use of energy inefficient vehicles such as SUVs, hobby pick-ups, and recreational vehicles. In addition, increases in impervious surfaces leads to an increase in the heat island effect and polluted stormwater runoff into streams and rivers. In Portland, researchers have shown that the heat island effect can raise temperatures by 12 to 15 degrees at times on the hottest days (Figure 4). A key GND strategy must be to halt the conversion of agricultural and forestland to subdivisions and strip malls. Many of these decisions are made through exemptions and amendments to land use plans and urban growth boundaries. Land use policy based on exemptions and amendments means no land use policy at all - what results is chaotic development. Metro, Portland’s regional growth management entity, recently authorized an expansion of the urban growth boundary to accommodate subdivisions that will add nearly 10,000 housing units to areas already suffering from traffic congestion, water quality impairments, and other environmental stresses.

Cities and counties have ample legal authority to say ‘no’ to new automobile dependent developments but repeatedly fail to use this authority. In addition, federal, state, and local agencies continue to spend taxpayer dollars to widen or build new freeways or highways to accommodate sprawl. Rather than alleviating congestion, new freeway construction often induces new growth that would otherwise not occur and ends up...
making matters worse. Climate stability means fewer cars on the road, not wider highways to accommodate more of them.

Decision makers can work, instead, to limit growth to transit accessible areas, lands now covered with underutilized parking lots and roadways, and former industrial lands. Public funds being sought for highway expansion could be used to greatly expand public transit systems to places where automobiles are, effectively, the only transportation choice. In addition, cities and counties should enact moratoria on expansion of urban growth boundaries and land use amendments and exemptions that facilitate sprawl and instead stick to what voters and decision makers have already enacted.

7. Climate test for spending and permits

Every year, federal, state, and local public agencies in Oregon make hundreds of decisions over land uses, infrastructure, and economic development that either directly or indirectly contribute to increased GHG emissions, loss of carbon sequestration capacity, and loss of climate resiliency. These decisions range from authorizing new subdivisions that will lock in high-carbon lifestyles for decades to grants and loans for industrial development to issuance of construction permits for energy intensive buildings. Because the state lacks an environmental policy act that would require disclosure and mitigation of climate and other impacts, these authorizations will continue to undermine Oregon’s climate agenda.

A binding ‘climate test’ refers to the use of best available climate science to evaluate and mitigate the climate impacts of all proposed projects that receive public funding or require state, county, or city-level authorizations.

“A binding climate test refers to use of best available climate science to evaluate and mitigate the climate impacts of all proposed projects that require state, county, or city-level authorizations or receive public funding. The climate test would be limited to those projects that are likely to result in a significant increase in GHG emissions, a reduction in carbon sequestration capacity, or a loss of climate resiliency (i.e. draining wetlands that would otherwise help mitigate flooding or storm surges). If such impacts cannot be mitigated below an established threshold of significance then the state, counties, and cities would be prohibited from authorizing or funding the proposal.

Precedents already exist, albeit in a more limited form. For example, in Washington State, and in fulfillment of the state’s environmental policy act, all projects that are likely to result in 10,000 metric tons lifecycle CO₂e emissions per year or which are vulnerable to the effects of a changing climate are subject to disclosure and mitigation requirements.

In 2016, Canada’s Prime Minister, Justin Trudeau pledged to apply a climate test to new fossil fuel infrastructure projects in the country, and it is expected that Canada’s National Energy Board Modernization process will incorporate the climate test into environmental review of new energy infrastructure in the near future. Many national and international environmental organizations, including NRDC, the Sierra Club, League of Conservation Voters and 350.org endorse the application of a climate test to energy projects and policies.

In 2017, a climate test bill was introduced to the Oregon legislature, Oregon HB 3344. However, the text lacked specific directives and mandates for projects that fail a climate test. A more expansive
version of this bill, one that would extend beyond just energy projects and prohibit all projects that fail to meet the climate test, is needed to close the environmental review gap for state authorized and funded projects in Oregon.

8. Achieve 100% renewable electricity

The transition to renewable energy is not only an opportunity to decarbonize our economy, but also an opportunity to build a world where clean, safe, resilient, and decentralized energy is available to all Oregonians at low or no cost.

In November 2018, Portland voters overwhelmingly approved the Portland Clean Energy Initiative which places a 1% business licensing surcharge on large retailers who generate over $1 billion in annual revenue and at least $500,000 in revenue in the City of Portland. The estimated $30-$70 million per year in revenue will be directed to a fund that will be spent on clean energy related activities such as weatherizing homes, installing solar and other renewable energy projects, providing job and contractor training, expanding local food production, and building green infrastructure in Portland. This is an idea that could easily be scaled up to create a statewide Oregon Clean Energy Fund. This approach has the advantage of avoiding the Highway Trust Fund restrictions on use of the revenues.

The Oregon Legislature has many additional tools at its disposal for accelerating the transition to renewable energy including:

- the establishment of a binding goal to achieve 100% renewable energy by 2045 or sooner (similar to California’s landmark policy);
- more aggressive renewable portfolio standards to require that electric utilities quickly phase out fossil fuels entirely;
- a feed-in tariff to promote decentralized renewable energy;
- community choice aggregation to allow communities to choose where they purchase energy from;
- strengthening and expanding the community solar program;
- expanding funding for energy efficiency retrofits with an emphasis on free upgrades for low-income households;
- enacting a transportation electrification requirement combined with free public transportation to encourage green and efficient travel, and
- reforming and democratizing the Oregon Public Utility Commission, enabling them to consider social and environmental costs in the integrated resource planning process. This will empower the PUC to include more diverse voices in their decision-making process and incentivize and fund community generated energy projects.

In addition, the legislature should study the potential benefit to ratepayers and the environment from direct public ownership of utilities, replacing the current model that prioritizes shareholder interests over Oregonians. Recent findings from a mandated review of PacifiCorp’s coal-fired power plants makes this point abundantly clear: the utility acknowledged to shareholders that they could save ratepayers $317 million by retiring five coal plants in Wyoming in Colorado. At the same time, it is important to recognize that waste incineration and small-scale nuclear energy have proven to be cost ineffective and that various subsidies supporting these technologies should be rescinded or redirected to better uses.

9. Climate smart forest practices

If managed well, Pacific Northwest forests can capture and store more carbon per hectare than almost any terrestrial ecosystem on Earth. Measurements of carbon density in old growth
forests surpass those found in most tropical forests – and have been found to exceed 1,200 tons carbon per hectare. But less than 10% of these forests remain, and the vast majority of lands outside the few remnant old growth reserves on federal forestlands have been converted to industrial tree plantations managed on increasingly short rotations to feed global markets for paper, packaging, biomass, and wood products.

These tree plantations, which dominate the 12 million acres of state and privately held forestland in Oregon, represent a duel threat to climate stability. First, industrial forest practices, including clearcutting, widespread application of chemical pesticides and fertilizers, construction of dense networks of logging roads, timber plantations, and short rotations represent the single largest source of greenhouse gas emissions in Oregon, according to two independent scientific estimates (Figure 5).17

Secondly, landscapes dominated by industrial tree plantations and clearcuts are more susceptible to wildfires, water shortages, toxic algae blooms, landslides, floods and outbreaks of insects and disease than natural forests. These threats are already on the rise due to climate change itself. Clearcuts, logging roads and plantations add fuel to the fire.

The good news is that replenishing Oregon’s forested landscape with climate resilient natural forests, not tree plantations, is not only possible but can be done in such a way as to generate enormous economic and social benefits to forest dependent communities. Climate smart forest practices are the solution. Climate smart forest practices operate in a sweet spot at the intersection of four coinciding goals: (1) reducing emissions; (2) enhancing sequestration; (3) building carbon storage on the land, and (4) improving climate resiliency (Figure 6). Afforestation, reforestation, long rotations, alternatives to clearcutting, forest carbon reserves, and thinning dense tree plantations to expedite their evolution into old growth forests are examples. These practices have been identified as, by far, the most important natural climate solutions available within the US. And since they are labor intensive and repopulate the land with forests that are suitable for multiple uses – not just timber – they create jobs and economic diversification opportunities wherever they are practiced.
Oregon legislators have been presented with several options for phasing out industrial tree plantations and scaling up climate smart alternatives. A forest carbon tax and reward system, whereby industrial operations are taxed at the social cost of carbon to capitalize a forest carbon incentive fund to pay for climate smart practices, is one. Rescinding and redirecting logging subsidies – which now total over $300 million per year is another. Modernizing Oregon’s antiquated Forest Practices Act – which does not distinguish between tree plantations and real forests – is another. A key provision in recent OFPA reform legislation is to ensure that a percentage of all lands are managed to develop late successional and old growth characteristics. This would help Oregon take advantage of its competitive advantage in forest carbon storage and represent one of the few globally significant contributions the state can make in the fight against global warming.

10. Regenerative agriculture

Industrial agriculture practices are major sources of greenhouse gas emissions and undermine climate resiliency by depleting soil productivity and soil carbon, leaving the landscape more vulnerable to droughts, pests and disease and polluting water bodies with chemicals and fertilizers that enhance the growth of harmful algae blooms. High tillage cropping, monocultures, chemicals, fertilizers and intensive grazing by livestock are significant sources of CO₂, nitrous oxide (N₂O) and methane (CH₄). In addition to carbon intensive crops, concentrated animal feed-lot operations also referred to as factory farms, are major point sources of GHG emissions. The Food and Agriculture Organization of the UN estimates that animal agriculture is responsible for between 14.5% and 18% of all human-induced greenhouse gas emissions.

Regenerative agriculture solutions, often called ‘carbon farming,’ include practices like reestablishing woodland buffers, riparian zones and wetlands within the crop-producing land matrix, using biological rather than chemical inputs, and using no-till and managed grazing methods to help increase carbon storage above ground and in the soil while greatly reducing GHG emissions. They also make the land more diverse, and resilient to climate change (Figure 7).

Figure 7: Biodiverse regenerative agriculture landscapes build soil carbon while making the land less vulnerable to pests, drought, and other threats posed by climate change. Photo credit: Toensmeier et al. (2016)
As with climate smart forest practices, regenerative agriculture represents one of the key global strategies for drawing CO₂ concentrations in the atmosphere back to below the 350-ppm safe zone upper limit.\textsuperscript{22}

But to do this in Oregon, major transformation of land use practices must occur. According to the annual USDA census of Oregon farms, just 1.2% of Oregon’s 16.3 million acres managed by farms and ranches is certified USDA organic - a reasonable proxy for the acreage managed with regenerative solutions. As is the case throughout the US, most of this acreage is devoted to meat production in one way or the other. Much of this land base is also degraded.

To expedite the conversion of farmland managed with conventional methods to regenerative alternatives, state policies need to change to make it easier for such farms to compete. As with forestlands, tax breaks and subsidies should be reserved for lands in good condition - biodiverse, free from pollutants, and continuously increasing soil carbon stocks. Lands that produce food for people, not animals, should also be subsidized, in order to incentivize a healthier climate while encouraging a healthier populace. Fiber crops like bamboo, hemp, and kenaf that could displace more carbon intensive products like wood-based papers should be incentivized. And biochar that can be used as a soil supplement to enhance carbon sequestration and water retention should be incentivized as well. Targeted subsidies for existing high impact crops - like Christmas trees and grass seed fields - can be shifted to help landowners transform these lands into more environmentally beneficial uses.

Another step towards improving the competitive position of regenerative farms is to rescind Oregon’s Right to Farm and Forest bill, which shields conventional farms from paying for the damages they cause to the environment or surrounding landowners. This will help reduce the routine chemical contamination of lands that would otherwise be certified as organic or sustainable and ensure that conventional farms bear the full social cost of their activities.

11. Demand reduction and efficiency

A basic design feature of cap and trade programs, including the one proposed in Oregon, is to focus regulation on producers - in particular, businesses that are responsible for generating over 25,000 metric tons CO₂ per year within state boundaries. As noted above, emissions associated with consumption activities are not directly addressed. While consumption emissions are indirectly affected by cap-induced reductions in the supply of certain goods - like natural gas - distributed by regulated entities and consumed locally, the vast majority of goods and services consumed by Oregonians are manufactured out of state and thus generate emissions well beyond state boundaries.

The Department of Environmental Quality maintains an inventory of these emissions by types of goods and services consumed. The most recent inventory estimates these emissions to be nearly 89 MMTCO₂/yr, well beyond the 64 MMTCO₂/yr associated with in-boundary production.\textsuperscript{23} Vehicles, food and appliances are the most carbon intensive goods purchased by Oregonians. The inventory also estimates where the emissions footprint takes place. Only 34% of the emissions associated with consumption of
goods and services in Oregon occurs within state boundaries – the rest occurs either in other parts of the US or globally (Figure 8). How can these emissions be reduced by climate policies in Oregon?

The key is to reduce demand for carbon intensive goods and scale up demand for less carbon intensive substitutes. The sustainable consumption literature groups policy tools to accomplish this into three broad categories: information-based, market-based, and regulatory. Information-based strategies seek to induce voluntary actions by educating consumers about the climate impacts of their choices. Examples include certification and labeling systems that disclose carbon footprints or public educational programs that inform the public about the climate benefits of less meat and dairy consumption or of buying local.

Market-based strategies include various forms of taxes, fees, and subsidies. A ‘feebate’ system that imposes carbon footprint fees on the sale of passenger vehicles with high life cycle emissions and rebates to consumers who buy electric or fuel-efficient vehicles is an example. Key regulatory approaches include energy efficiency standards for vehicles, appliances and housing, rescinding or redirecting consumption subsidies, changes in public procurement patterns to eliminate waste and substitute carbon neutral goods for carbon intensive ones, and public investments in resource efficiency. In Oregon, the National Renewable Energy Laboratory estimates that cost-effective efficiency investments can reduce household energy use by 29%, reduce utility bills, and create many new jobs. Public investments can help low-income households make this transition rapidly and should be part of a GND for Oregon.

In addition, over the past three years Oregon has seen the use of natural gas grow faster in our homes than in any other state (a 9% increase between 2015 and 2017 according to Energy Information Administration data). This gas is used for space and hot water heating, as well as stoves and dryers. Overall, we burn nearly as much gas in Oregon’s residential and commercial buildings as we do in all of Oregon’s power plants (Figure 10). In a climate-constrained world, this consumption must be significantly reduced.

Oregon can start by eliminating all subsidies for new gas line extensions to new buildings and ending state subsidies for new gas appliances. To meet our ambitious climate targets, we must commit to phasing out the use of natural gas (and other fossil fuels) in our buildings at the same pace as for

Figure 8: Oregon’s consumption-based inventory of greenhouse gas emissions.
other sectors, which will require that we align all state energy efficiency programs to help all buildings rapidly transition to super-efficient all-electric appliances. The good news is that all-electric buildings are safer, cleaner, and cheaper and therefore a good way to achieve climate goals while reducing costs and improving health for residents.

**Concluding thoughts**

A robust climate agenda for Oregon will require Governor Kate Brown and legislators to go far beyond what is being addressed through the cap and invest framework and embrace a suite of complementary measures such as those discussed here and others that have been highlighted as part of the Green New Deal. If California’s experience provides a signal for what Oregonians can expect, such complementary measures will represent the most significant policies the state can enact to reduce GHG emissions, expedite a dramatic increase in carbon captured and stored on the land, and help communities adapt to climate change in a way that creates jobs and protects public health. Such measures should be enacted in parallel with - or lieu of - the cap and invest legislation to ensure that the state does not lose valuable time in the fight against global warming.

"A robust climate agenda for Oregon will require Governor Kate Brown and legislators to go far beyond what is being addressed through the cap and invest framework and embrace a suite of complementary measures as part of a Green New Deal.”
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About Center for Sustainable Economy

Center for Sustainable Economy straddles the divide between a think tank and a do tank. We conduct peer-reviewed research on the full range of sustainable development challenges humanity faces, including climate change, deforestation, extinction, inequality and poverty. We develop innovative solutions such as new measures of progress and new policies to expedite the transition to renewable energy. We are also vocal advocates for change, using legislative and administrative processes, the courts, and grassroots mobilization to achieve our goals.

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ENDNOTES


9 Oregon’s sector based GHG emissions inventory is accessible here: https://www.oregon.gov/deq/ac/programs/Pages/GHG-inventory.aspx. The consumption-based inventory is accessible here: https://www.oregon.gov/deq/mm/Pages/Consumption-based-GHG.aspx.


23 Oregon Department of Environmental Quality. Consumption-based greenhouse gas inventory for Oregon. Accessible online at: https://www.oregon.gov/deq/mm/Pages/Consumption-based-GHG.aspx.
