Fossil Fuel Terminal Zoning Amendments

Proposed Draft

City of Portland, Oregon
August 12, 2016

Bureau of Planning and Sustainability
Innovation. Collaboration. Practical Solutions.
City of Portland, Oregon

How can I provide feedback to decision-makers?

The Fossil Fuel Terminal Zoning Amendments project would begin to implement new policy direction on fossil fuel distribution and storage facilities through changes to the Zoning Code. This proposal would restrict development and expansion of bulk fossil fuel terminals.

You may testify about proposed changes to the Planning and Sustainability Commission (PSC) in the following ways:

Testify in person at the PSC public hearing.
You may speak for 2 minutes to the Commission, and your testimony will be added to the public record.

> **PSC Fossil Fuel Terminal Zoning Amendments Public Hearing**
> Tuesday, September 13, 2016 at 12:30 p.m.
> 1900 SW 4th Avenue, Room 2500, Portland, OR
> To confirm the time and date, check the PSC calendar at www.portlandoregon.gov/bps/35452

Testify in writing between now and September 13, 2016.
Please provide your full name and mailing address.

- Email: *psc@portlandoregon.gov* with subject line "PSC Fossil Fuel Zoning Testimony"
- U.S. Mail: Portland Planning and Sustainability Commission, Fossil Fuel Zoning Testimony, 1900 SW 4th Ave., Suite 7100, Portland OR 97201

Next Steps

The PSC may amend this proposal and will subsequently vote to recommend the code changes to Portland City Council. This is called the *Recommended Draft*.

Recommended Draft: City Council will hold an additional public hearing and take formal public testimony on the Recommended Draft. The City Council may amend the Recommended Draft before they vote to adopt the code changes. This will likely occur in December 2016.

The Bureau of Planning and Sustainability is committed to providing equal access to information and hearings. If you need special accommodation, please call 503-823-7700, the City's TTY at 503-823-6868, or the Oregon Relay Service at 1-800-735-2900.

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Acknowledgments

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1. Introduction

In recent years, the rapid development of fossil fuel resources in the Western United States and Canada has prompted many proposals in the Pacific Northwest for new large fuel terminals and infrastructure projects. In early 2015, Pembina Pipeline Corporation proposed a propane terminal in Portland that drew substantial public opposition. Mayor Charlie Hales withdrew a proposed zoning code amendment that the development needed to move forward, effectively blocking that proposal. In November 2015, Portland City Council adopted Resolution 37168 calling for opposition to expansion of fossil fuel infrastructure. In June 2016, City Council adopted the 2035 Comprehensive Plan, which included Policy 6.48 to limit fossil fuel distribution and storage facilities to those needed to serve the regional market. This code-change project begins to implement the policy direction in the resolution by prohibiting large bulk fossil fuel terminals.

Project summary

The Fossil Fuel Terminal Zoning Amendments project would restrict the development and expansion of Bulk Fossil Fuel Terminals.

Proposed zoning code amendments:

- Identify "Bulk Fossil Fuel Terminals" as a regulated land use, characterized by marine, railroad, or pipeline transport access and storage capacity exceeding 5 million gallons.
- Prohibit Bulk Fossil Fuel Terminals in all base zones.
- Existing Bulk Fossil Fuel Terminals would become legal, non-conforming uses that can continue to operate. Expansion would be limited to their current site and require approval through a Nonconforming Situation Review.

Why is this important?

Fossil fuel distribution policy – New policy directions adopted by City Council in November 2015 and in the 2035 Comprehensive Plan would limit fossil fuel distribution and storage facilities to those serving the regional market. City Council adopted these policies after holding public hearings and hearing testimony from hundreds of Portlanders.

Climate action goals – Fossil fuels are major contributors to climate change and pollution. The rapid development of fossil fuel resources in the Western United States and Canada has prompted many recent proposals for new export terminals in the Pacific Northwest. The City's Climate Action Plan seeks to reduce greenhouse gas emissions with fossil fuels being the largest source of emissions.

Public safety and environmental protection – Several recent accidents involving fossil fuel distribution across the nation and in Oregon highlight public safety risks in cities and environmental risks along rivers. Most of Portland's industrial areas have moderate-to-high liquefaction susceptibility in a major earthquake.

Oregon's industrial and distribution center – Portland is Oregon's largest, most diverse distribution hub, and existing Portland petroleum terminals serve more than 90 percent of the statewide market. Proposed code changes would restrict the expansion of these facilities in Portland.

Project scope and timing

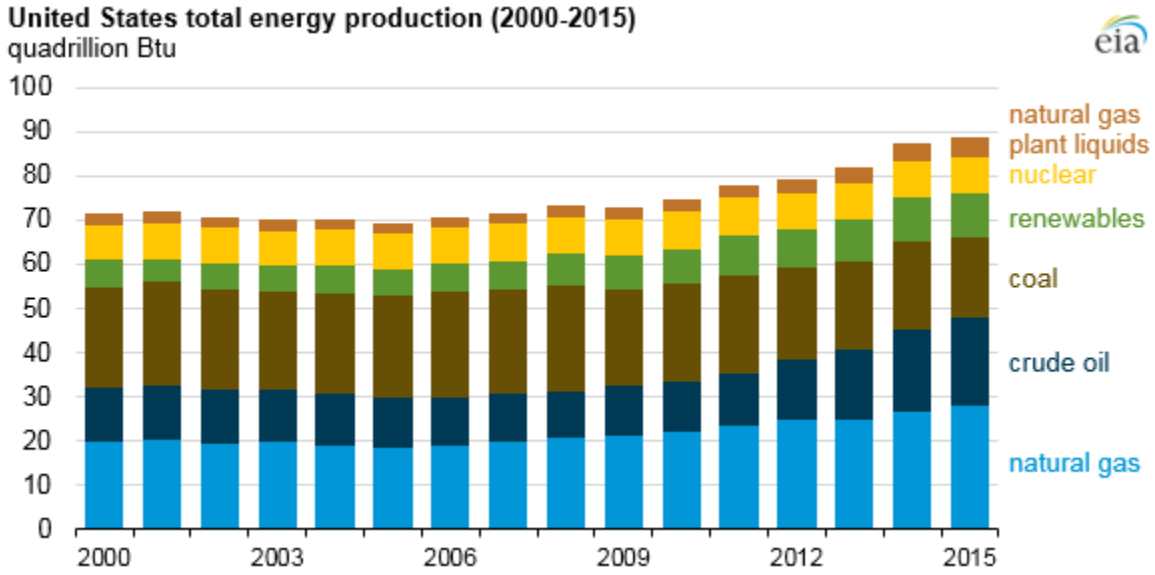
The energy distribution market in the Pacific Northwest is changing. Production of crude oil and natural gas, particularly from North Dakota, has substantially increased in the U.S. since 2009, as shown in Figure 1. In turn, several large new fuel distribution terminals have been proposed in the Pacific Northwest to access West Coast and export markets, as shown in Figure 2. Similar trends have occurred in Alberta and British Columbia.

This project is proposing a prompt, focused response to these market changes. The proposed code amendments will restrict development of new fossil fuel terminals and limit the expansion of existing terminals, consistent with City and State objectives on climate change and public safety.

Where are Portland's existing bulk fossil fuel terminals?

Portland's industrial districts are Oregon's largest seaport, rail hub and truck distribution center. The Northwest Industrial District in Portland is also the end of the Olympic Pipeline, which supplies most of Oregon's petroleum fuels from Puget Sound refineries. The ten petroleum terminals located in Northwest Portland are the gateway distribution facilities serving Oregon and Southern Washington markets. Additionally, NW Natural's GasCo terminal provides peak-consumption storage of natural gas for much of the regional market. In Northwest Portland, these "tank farm" storage facilities have direct access to pipeline, deep-water port, railroad and truck route infrastructure.

Figure 1. Increasing U.S. energy production



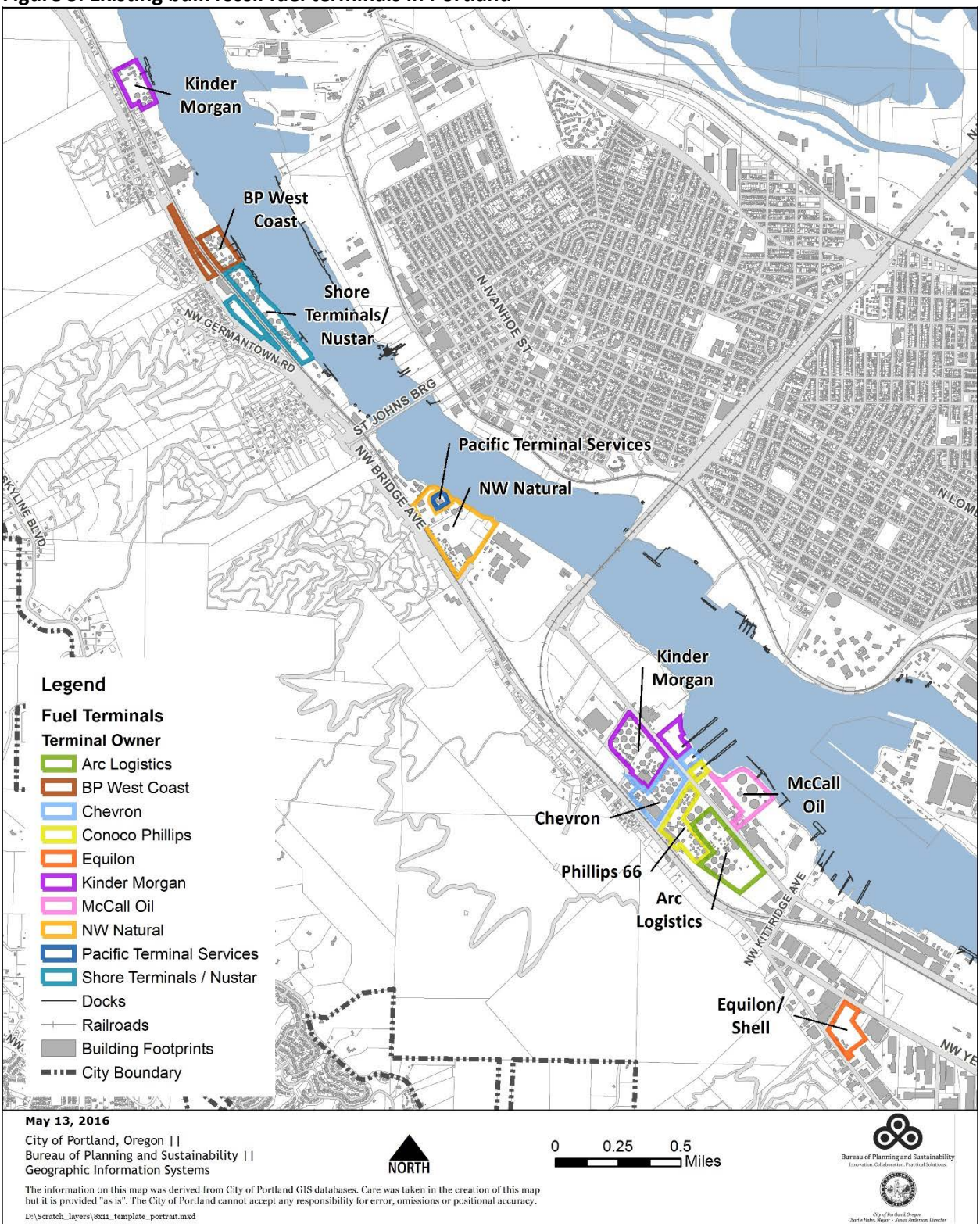
Source: U.S. Energy Information Administration, 2016

Figure 2. Examples of recent fossil terminal proposals in the Pacific Northwest

Operator	*Facility type*	*Location*	*Proposed new storage capacity*
Petroleum fuels			barrels
Vancouver Energy	Crude oil terminal	Vancouver WA	2,160,000
Imperium Renewables	Biofuels terminal	Grays Harbor WA	720,000
Gaseous fuels			gallons
Oregon LNG terminal	New LNG terminal	Warrenton OR	84,000,000
Jordan Cove LNG	New LNG terminal	Coos Bay OR	84,000,000
Pembina	Propane terminal	Portland	35,000,000
Haven Energy	Propane terminal	Longview WA	23,000,000
Coal			Stockpile acres
Millennium Bulk Terminal	Coal terminal	Longview WA	~20
Ambre Energy	Coal transload facility	St. Helens OR	no storage
Gateway Pacific Terminal	Coal terminal	Bellingham WA	80

Five petroleum terminals are located in the Willbridge area of NW Portland.

Figure 3. Existing bulk fossil fuel terminals in Portland



What's in this report?

This *Proposed Draft* of Fossil Fuel Terminal Zoning Amendment is proposed by the Bureau of Planning and Sustainability for consideration by the Planning and Sustainability Commission. The audience is the Commission and the general public, including stakeholders, inter-governmental partners, implementers and other interested parties. Project stakeholders include property owners, businesses, employees, residents, neighbors, business district and neighborhood associations, underrepresented and underserved groups, environmental groups and other community groups. Implementers include the real estate industry, development review staff and others who use the zoning code.

Your feedback on the Proposed Draft should be directed to the Planning and Sustainability Commission (PSC). You may testify about the proposed changes in person at the PSC public hearing on September 13, 2016, or testify in writing before the public hearing (see information about how to provide feedback on the inside cover of this report).

This report consists of seven parts:

- **Section 1** introduces the project.
- **Section 2** describes how the proposed code changes implement City policies in Resolution 37168 and the 2035 Comprehensive Plan.
- **Section 3** summarizes public and stakeholder involvement activities that have helped shape and inform this project.
- **Section 4** describes background conditions that inform the proposed zoning changes.
- **Section 5** describes the analysis of proposed zoning concepts, including related policy directions, implementation issues and rationale.
- **Section 6** specifies the draft code language, along with code commentary pages that clarify expected implementation.
- **Section 7** recommends future implementation directions for building code amendments to address seismic resilience and periodic monitoring for code effectiveness.

2. Policy direction

Section 2 describes how the proposed code changes implement relevant City policies in Resolution 37168 and the Comprehensive Plan.

City of Portland Fossil Fuel Resolution 37168

> BE IT RESOLVED, that the City Council will actively oppose expansion of infrastructure whose primary purpose is transporting or storing fossil fuels in or through Portland or adjacent waterways; and

The proposed zoning code changes are a key implementation action of Resolution 37168, adopted November 2015. Addressing the overall direction of the resolution to oppose expansion of fossil fuel distribution and storage infrastructure, this project proposes to restrict development and expansion of bulk fossil fuel terminals.

> BE IT FURTHER RESOLVED, that this Resolution does not restrict:
> 1. improvements in the safety, or efficiency, seismic resilience, or operations of existing infrastructure;
> 2. the provision of service directly to end users;
> 3. development of emergency backup capacity;
> 4. infrastructure that enables recovery or re-processing of used petroleum products; or
> 5. infrastructure that will accelerate the transition to non-fossil fuel energy sources; and

The proposed code changes will require a discretionary land use review for many of the exceptions listed in the Resolution. Expansion projects at existing fuel terminals that improve safety (1), provide wholesale fuel supply to local or regional end users (2), add backup capacity (3), or add tanks for clean/renewable fuels (5) would require approval through a Nonconforming Situation Review. The review criteria include that, with mitigation measures, there will be no net increase in overall detrimental impacts on the surrounding industrial zone (such as hours of operation and vehicle trips) and the expansion will not detract from the desired function and character of the industrial zone. Terminal improvements would also be limited to their existing site area. Improvements that address the exceptions 1-5 in the Resolution are not generally expected to result in additional detrimental impacts on the surrounding industrial zone. The proposed code changes also substantially address exceptions 2 and 4 in the Resolution through exclusion of specific end-user facilities and recovery or re-processing of used petroleum products from the proposed new land use restrictions on Bulk Fossil Fuel Terminals.

> BE IT FURTHER RESOLVED, that City bureaus are directed to examine existing laws, including those related to public health, safety, building, electrical, nuisance, and fire codes, and develop recommendations to address fossil fuels that strengthen public health and safety; and

The resolution broadly addresses fossil fuel infrastructure. The zoning code regulates land use patterns and development of fossil fuel distribution facilities on parcels. Zoning does not regulate the quantity of products handled (throughput) on developed sites or their destination (such as exports). Additional amendments to building, fire and energy codes would need to be addressed in future projects.

> BE IT FURTHER RESOLVED, that the Bureau of Planning and Sustainability is directed to develop proposed code changes for Council consideration to advance the policies set forth in this Resolution; and

The proposed project will specifically implement this provision of the resolution.

> BE IT FURTHER RESOLVED, that prior to any further Council action, the mayor shall schedule (1) a work session to review any proposed code changes and (2) an executive session to review the legal considerations of any proposed code changes; and

The proposed project will implement this process requirement of the resolution.

> BE IT FURTHER RESOLVED, that the Bureau of Planning & Sustainability shall undertake an analysis of the economic impacts of any proposed Code changes to advance the policies set forth in this resolution, with a particular focus on potential impacts to local blue-collar jobs; and

This report includes summary analysis of economic impacts in Section 4, specifically addressing impacts on middle-wage blue collar jobs. Analysis to date is limited on the potential impacts on fuel supply to meet regional demand. Fossil fuel demand in this growing region may increase moderately, as indicated by trend-based forecasts, or may plateau and decline with implementation of climate resilience goals and strategies. Staff will continue to research and analyze potential economic impacts of proposed code changes prior to adoption.

> BE IT FURTHER RESOLVED, that the City and applicable bureaus shall seek and identify opportunities to invest in Portland's 'human infrastructure' by supporting programs to retrain our workforce as the city transitions to a clean energy economy; and

This provision of the resolution is expected to be implemented as a future action.

> BE IT FURTHER RESOLVED, that the City shall consult with its Tribal Government Partners, the State of Oregon, local governments, and other key stakeholder including labor, business, environment, neighborhoods and communities of color in advancing this policy;

The Mayor's Office staff has sought input from and will continue to reach out to the entities identified above to implement this process requirement of the resolution.

Guiding principles of the 2035 Comprehensive Plan

The Comprehensive Plan sets five Guiding Principles, which encourage balanced, integrated multi-disciplinary approaches that must comply with the Plan. This project is consistent with the Guiding Principles because it promotes major benefits to human health and safety, environmental health and resilience, and integrates considerations for economic prosperity and equity.

Economic prosperity

> *Guiding Principle: Support a low-carbon economy and foster employment growth, quality education and training, competitiveness, and equitably-distributed household prosperity.*

The proposed code changes would restrict expansion at existing fuel terminals and prohibit new terminal development, impacting associated job growth and tax revenue. The proposed code

restrictions on fossil fuel terminal development would also limit potential financial risks from a major accident involving fossil fuel infrastructure.

Human health

> *Guiding Principle:* Avoid or minimize negative health impacts and improve opportunities for Portlanders to lead healthy, active lives.

Major benefit – The proposed code changes would reduce the scale of low, but potentially catastrophic, safety risks associated with the growth of fossil fuel infrastructure, including oil train derailments, explosive accidents at liquefied natural gas (LNG) and liquefied petroleum gas (LPG) facilities, and seismic risks of tank farms. Fossil fuel emissions and coal dust are also significant sources of air pollution associated with respiratory disorders.

Environmental health

> *Guiding Principle: Weave nature into the city and foster a healthy environment that sustains people, neighborhoods, and wildlife. Recognize the intrinsic value of nature and sustain the ecosystem services of Portland's air, water, and land.*

Major benefit – The human health benefits described above also extend to environmental health. The proposed code changes would reduce the scale of environmental health risks associated with the growth of fossil fuel infrastructure, including oil train derailments along the Columbia River, LNG and LPG facilities in riparian areas, and seismic risks of tank farms along the Willamette River. Fossil fuel emissions are also a significant source of air pollution.

Equity

> *Guiding Principle: Promote equity and environmental justice by reducing disparities, minimizing burdens, extending community benefits, increasing the amount of affordable housing, affirmatively furthering fair housing, proactively fighting displacement, and improving socio-economic opportunities for under-served and under-represented populations. Intentionally engage under-served and under-represented populations in decisions that affect them. Specifically recognize, address, and prevent repetition of the injustices suffered by communities of color throughout Portland's history.*

The proposed code changes would restrict expansion at existing fuel terminals and prohibit new terminal development, impacting associated middle-wage, industrial job growth that disproportionately benefits workers of color. Restricting potential increases in regional supply of fossil fuels could also have regressive impacts of increasing fuel costs, disproportionately affecting lower-income people.

Resilience

> *Guiding Principle: Reduce risk and improve the ability of individuals, communities, economic systems, and the natural and built environments to withstand, recover from, and adapt to changes from natural hazards, human-made disasters, climate change, and economic shifts*.

Major benefit – The proposed code changes would restrict development of fossil fuel terminals consistent with City and State objectives on climate change and public safety. While fossil fuels like natural gas and propane have the potential to replace higher-carbon fuels, substituting these fuels for higher-carbon fuels does not begin to approach the goal of an 80% reduction in carbon emissions by 2050 established in Portland's Climate Action Plan or the State's 75% goal.

2035 Comprehensive Plan policies specifically implemented in this project

The proposed zoning changes in the project are implementing the following specific policies.

Overall project direction: Fossil fuel distribution

> *Policy 6.48 Fossil fuel distribution. Limit fossil fuel distribution and storage facilities to those necessary to serve the regional market.*

The proposed code changes would implement Policy 6.48 by restricting development and expansion of fossil fuel distribution terminals. Analysis to date on the potential impacts of code amendments in constraining fossil fuel supply to meet regional demand is limited. Fossil fuel demand in this growing region may increase moderately, as indicated by trend-based forecasts reviewed in Section 4, or may plateau and decline with implementation of climate resilience goals and strategies. The Zoning Code provides discretionary flexibility for expansion of existing fuel terminals within their existing site area through a non-conforming situation review, subject to mitigating any net increase of detrimental impacts on the surrounding industrial zone.

Related policy directions

> *Policy 4.81 Disaster-resilient development. Encourage development and site-management approaches that reduce the risks and impacts of natural disasters or other major disturbances and that improve the ability of people, wildlife, natural systems, and property to withstand and recover from such events.*
>
> *Policy 4.82 Portland Harbor facilities. Reduce natural hazard risks to critical public and private energy and transportation facilities in the Portland Harbor.*

Policies 4.81 and 4.82 are partly met by prohibiting fuel terminal development in Portland's industrial areas that are predominantly in locations with high susceptibility to soil liquefaction (see Figure 7 in Section 4). Incremental expansion at existing terminals also provides a pathway for market-driven safety improvements, providing financial return to cover improvement costs. As described above, the Zoning Code provides discretionary flexibility for such expansion through a nonconforming situation review.

> *Policy 6.2 Diverse and expanding economy. Align plans and investments to maintain the diversity of Portland's economy and status as Oregon's largest job center with growth across all sectors (commercial, industrial, creative, and institutional) and across all parts of the city.*
>
> *Policy 6.5 Economic resilience. Improve Portland's economic resilience to impacts from climate change and natural disasters through a strong local economy and equitable opportunities for prosperity.*
>
> *Policy 6.6 Low-carbon and renewable energy economy. Align plans and investments with efforts to improve energy efficiency and reduce lifecycle carbon emissions from business operations. Promote employment opportunities associated with the production of renewable energy, energy efficiency projects, waste reduction, production of more durable goods, and recycling.*

The proposed code changes are consistent overall with the range of direction in Policies 6.2, 6.5 and 6.6, providing code-limited flexibility for incremental expansion of existing terminals as part of a diverse, expanding economy and prohibiting development of new fossil fuel terminals that conflict with resilience and climate action goals.

Existing Comprehensive Plan policies specifically implemented in this project

The 2035 Comprehensive Plan was adopted in June 2016 and is not expected to take effect until early 2018. In the meantime, the existing Comprehensive Plan is in effect.

> *Policy 7.6 Energy Efficient Transportation. Provide opportunities for non-auto transportation including alternative vehicles, buses, light rail, bikeways, and walkways. The City shall promote the reduction of gasoline and diesel use by conventional buses, autos and trucks by increasing fuel efficiency and by promoting the use of alternative fuels.*
>
> *Policy 7.8 Energy Supply. The City shall promote conservation as the energy resource of first choice. The City shall also support environmentally acceptable, sustainable energy sources, especially renewable resources such as solar, wind, hydroelectric, geothermal, biomass (wood, farm and municipal waste), cogeneration, and district heating and cooling.*

The proposed code changes are consistent with Policies 7.6 and 7.8, promoting the use of alternative energy sources by restricting development and expansion of fossil fuel terminals.

2015 Climate Action Plan

> *Goal: Reduce local carbon emissions 80 percent from 1990 levels by 2050, with an interim goal of 40 percent by 2030.*

As described in Section 4, lower-carbon fossil fuels like natural gas and propane have the potential to replace higher-carbon fuels, but they do not approach the goal of an 80% reduction in carbon emissions by 2050 in Portland's Climate Action Plan or the State's 75% goal. Investments in major infrastructure typically take decades to recoup, and the transition to renewables needs to go much faster than that to stabilize global emissions. The proposed code changes are consistent with the 80% goal of the Climate Action Plan by restricting development of fossil fuel terminals.

3. Public and stakeholder involvement

Section 3 summarizes public and stakeholder involvement activities that have helped shape and inform this project. Stakeholder focus group results are further explained in Appendix A of this report.

What have we heard leading up to this project?

Public hearings at the Planning and Sustainability Commission and City Council on the Pembina terminal development proposal in 2014 and Resolution 37168 in 2015 drew testimony from hundreds of people. The overall theme of that testimony was strong objection to the Pembina project and support for the fossil fuel resolution. Primary reasons included the neighborhood safety and health risks and inconsistency with the City's climate action objectives. The Resolution also drew letters with strong opposition from state and regional business associations.

Following adoption of the Resolution in November 2015, City Council added the related Policy 6.48 on fossil fuel distribution to the 2035 Comprehensive Plan, reflecting the recently adopted policy direction in the Resolution. Public involvement in the Comprehensive Plan Update included public hearings in April 2016 on City Council amendments and thousands of comments on the 2035 Comprehensive Plan over the previous 8 years. The proposed code amendments are consistent with several sustainability-related policies in the Plan. Addressing issues with policy tradeoffs, the 2035 Comprehensive Plan calls for a balanced, integrated approach to implement multiple goals. As described in Section 2, the proposed code amendments provide major benefits toward implementing three of the Plan's five guiding principles and integrates consideration of the other two guiding principles.

Public involvement activities in this project

Extensive public comments were received on the Discussion Draft and influenced substantial changes between the Discussion and Proposed Drafts.

Over 700 people sent emails asking for a "full ban" on new and expanded fossil fuel terminals. Their comments included three generally consistent recommendations: a ban on new bulk fossil fuel terminals; tight limits on expansion at existing facilities; and provisions to improve the safety and resilience of existing terminals. Common themes of these comments included:

- return to the initial intent and plain language of the resolution;
- where the resolution was bold, visionary, and historic, the discussion draft is short-sighted and prioritizes the fossil fuel industry over the health and safety of Portlanders;
- the discussion draft allows new bulk terminals to be built and existing facilities to expand, which will grow our carbon footprint past the point of being able to meet our local and state carbon reduction goals;
- transporting and storing fossil fuels are never safe, with risks ranging from oil train derailments and pipeline spills to storage tank explosions and tank destabilization from earthquakes;
- require existing fossil fuel terminals to make upgrades for seismic resilience to protect the health and safety of neighboring communities and the Willamette River;
- invest heavily in renewables with and urgency befitting the climate crisis.

Similar comments for further restrictions on terminal growth and seismic improvements were also made in letters from 350PDX, Portland Audubon, Center for Sustainable Economy, Columbia Riverkeeper, Oregon Sierra Club, Climate Solutions, members of a City Club seismic safety subcommittee, Linnton Neighborhood Association, League of Women Voters and other residents. Examples of other concerns raised in those letters include that code changes serve as a bold model for other jurisdictions; to partner with Portland Bureau of Emergency Management on seismic safety; and to clarify forecast growth methodologies relative to climate policies.

Themes of comments on the Discussion Draft from business and labor organizations included opposition to proposed code changes, requests for more time and analysis, and clarifications to address practical considerations. Letters were received from NW Natural, Port of Portland, Columbia Pacific Building and Construction Trades Council, Kinder Morgan, Arc Terminals, and Western States Petroleum Association (WSPA). Some examples of comments included that growth rates will change over time, that fuels meeting Oregon's Clean Fuel Standard should be excluded, inclusion of non-fuel methanol is inconsistent, and the economic analysis is cursory. WSPA submitted draft code language, including focusing terminal restrictions on extra-regional facilities beyond the West Coast (PADD V) region and a new Energy Corridor Overlay Zone that protects the historic energy cluster for energy infrastructure growth.

Public involvement in concept development for the project consisted primarily of four stakeholder focus groups, which were held in June 2016 to review preliminary code concepts and help identify and understand potential implementation issues. The focus groups highlighted the range of stakeholder perspectives and interests concerning proposed zoning changes. Figure 4 summarizes the themes of issues raised in the focus groups. Other outreach activities have included meetings with interagency partners, terminal operators, and other interested stakeholders. These activities and what we heard in them are further described in the appendix of this report.

Inter-governmental coordination

The Mayor's Office staff has sought input from and will continue to reach out to Tribal Government Partners to shape and inform the draft code amendments.

An In-House Draft Report was circulated to inter-bureau partners in June 2016, and their comments have helped to shape and inform the Discussion Draft, particularly addressing code administration and legal limitations. Bureau of Planning and Sustainability staff will continue to meet with inter-governmental partners to refine responses to implementation issues.

Figure 4. Summary themes of stakeholder focus group comments

TOPIC	FUEL TERMINAL REPRESENTATIVES	ENVIRONMENTAL AND HEALTH ORGANIZATIONS	STATE AND REGIONAL BUSINESS ORGANIZATIONS	NEIGHBORHOOD AND EQUITY ORGANIZATIONS
Key issues	▸ We've operated safely for decades. We meet the federal/state low-carbon fuel standards. ▸ Difficult to participate: very quick process; emotionally driven; antitrust restrictions. ▸ Unintended impacts: harder to meet clean fuel standards; more trucks on road; costs to rest of the state.	▸ Looking for strong, model code. Expect community backlash if expectations not met. ▸ Safety needs to be integral with climate - Mosier oil train wreck; terminals in liquefaction soils. ▸ Include disaster risks in economic analysis. Bonding or insurance for worst case.	▸ Resolution requires more research on economic impacts, etc. ▸ How will the code hold up in 5 years? ▸ What is the goal? If climate or safety, zoning tool is not the right fit. ▸ Portland is not an economic island. Statewide impact. ▸ Big political decision. Don't rush it.	▸ Safety and pollution are our priority. Look closely at seismic and explosion risks. ▸ A reasonable expectation for growth is smart. ▸ This is aggressive. Without LNG, won't China burn more coal? ▸ Rail safety in the Gorge is also a key issue that this can't resolve.
New land use category	▸ If unclear, permit staff could be pressured - unpredictable results. ▸ Use federal West Coast PADD 5 "region."	▸ Regulate both existing and new facilities. ▸ New code must effectively implement the policy.	▸ Need clear definitions: region, export, end user. ▸ Do not make terminals non-conforming or an ambiguous limited use.	▸ Why allow it in IG2? ▸ A new export terminal in contaminated harbor is unlikely.
Definition of fossil fuels	▸ Natural gas considered a low carbon fuel by State, so why included here? ▸ Tomorrow's cleaner fuels won't meet today's definitions.	▸ Excluding methanol undermines policy. ▸ If end use is mostly fuel, then limit it. ▸ One new LNG tank is a big risk. So is coal.	▸ Federal and state are going a different direction, requiring cleaner fossil fuels. Why restrict cleaner fuels at cross purposes?	▸ Make way for bio-diesel as a cleaner fuel. ▸ Methanol not a fuel in Oregon - overreaching. ▸ Fuels are okay if they have no emissions.
Terminal development restrictions	▸ Some sites are already built-out. ▸ Our non-contiguous sites are connected by pipelines. ▸ Can't comment on size.	▸ Most prefer Option A. ▸ Caution about Commerce Clause. ▸ 1% annual growth metric is too high.	▸ Don't come at sideways. Unclear rationales will lead to appeals. ▸ Size limits would put region on "import diet." ▸ Dated, low forecast.	▸ Option C preferred. ▸ Allow for modest growth of LNG and oil; not coal. ▸ Review size limits every few years.

4. Background conditions

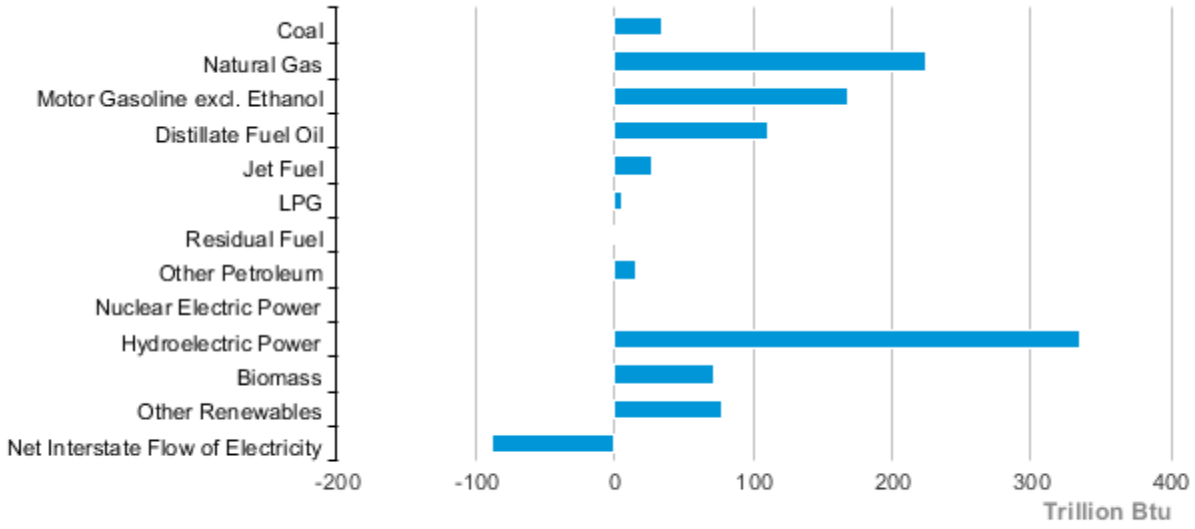
This section of the report describes background conditions that inform the proposed zoning changes. Topics include access to energy, impacts on the economy, climate change impacts, and health and safety impacts of draft zoning code changes. Background information on changing energy markets in the Pacific Northwest and Portland's existing fossil fuel terminals is included in the Section 1. Legal and policy background information is presented in Section 2.

Access to energy

Energy consumption in Oregon

Oregon residents and businesses rely on Portland's fossil fuel distribution and storage facilities as a wholesale distribution hub to meet their energy consumption needs. Estimated state energy consumption by fossil fuels and other sources are shown in Figure 5. Residents and businesses in much of Southern Washington also rely on Portland terminals for access to fuels.

Figure 5. Oregon energy consumption estimates, 2014



eia Source: Energy Information Administration, State Energy Data System

Four refineries in the Puget Sound area supply nearly all of the petroleum fuels consumed in Oregon, delivered primarily through the Olympic Pipeline that terminates at the cluster of 10 petroleum terminals in Northwest Portland. From there, petroleum products are delivered to Oregon and Southern Washington markets via truck, pipeline and barge. NW Natural supplies natural gas to its Western Oregon market area and operates peak-consumption storage terminals in Northwest Portland

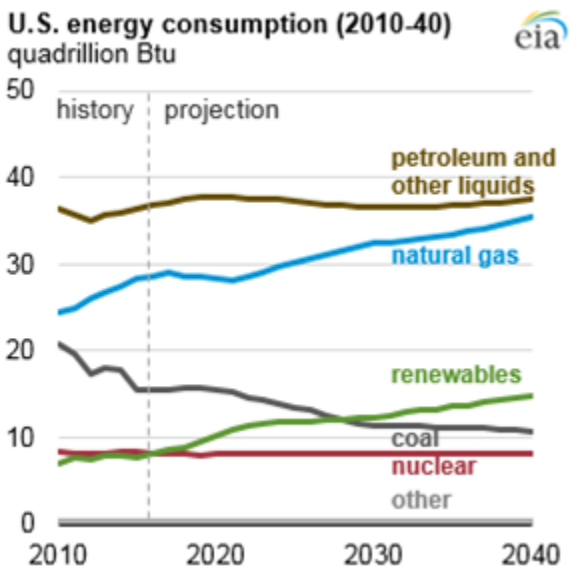
and Newport. Thus, fossil fuel terminals in Portland are a primary statewide distribution hub for transportation fuels and natural gas.

Energy consumption forecasts and the demand for additional storage capacity

Analysis to date is limited on the energy consumption forecasts and how the proposed code changes would impact the demand for additional fossil fuel storage capacity. Fossil fuel demand in this growing region may increase moderately, as indicated by trend-based forecasts, or may plateau and decline with implementation of climate resilience goals and strategies. National forecasts of energy consumption by the U.S. Energy Information Administration show varying growth trajectories by energy type, including a relatively flat outlook for petroleum fuels, decline for coal, and moderate growth for natural gas and renewables (see Figure 6).

Liquid bulk cargo in Portland Harbor is projected to expand at a range of 0.5% to 1.0% average annual growth (AAG) to 2040 (BST Associates, 2012), providing an estimate of potential market expansion needs for petroleum fuels, which could mean a need for an additional 10-20% increase in storage capacity. However, based on this forecast, ECONorthwest (2012) estimated that there was no additional land needed for new liquid bulk terminals in Portland. The 1.9% average annual growth forecast to 2034 (NW Natural 2014 Integrated Resource Plan) provides an estimate of market expansion needs for natural gas distribution facilities.

Figure 6. U.S. energy production and consumption projections to 2040



Source: US Energy Information Administration, Annual Energy Outlook 2016

Even if regional fossil fuel demand follows trend-based local forecasts, there is a wide margin between the size of recently proposed crude oil, coal, and LNG terminals proposed in the Pacific Northwest and the scale of expected growth of existing Portland fuel terminals that generally serve the regional market area, as shown in Figure 7.

Contradictory stakeholder comments were received that local growth projections are too high, too low, and could change substantially with market innovations. To address this uncertainty, periodic monitoring for code effectiveness is recommended in Section 7 as a future implementation project,

including monitoring for changes in regional fuel demand over time. Staff will continue to research and analyze potential economic impacts of proposed code changes prior to adoption.

Figure 7. Estimated storage capacity at existing and proposed fuel terminals

Operator	*Facility type*	*Location*	*Site acres*	*Storage capacity*	*New Storage capacity*
Petroleum fuels					
Existing Portland terminals				bbls	
Chevron	Petroleum terminal	NW Portland	21	1,600,000	
Kinder Morgan Willbridge	Petroleum terminal	NW Portland	33	1,551,000	
Arc Logistics	Asphalt/crude oil	NW Portland	39	1,466,000	
NuStar	Petroleum terminal	NW Portland	22	1,191,000	
McCall Oil	Petroleum terminal	NW Portland	19	930,000	
Conoco Phillips	Petroleum terminal	NW Portland	21	760,000	
BP West Coast	Petroleum terminal	NW Portland	18	601,500	
Kinder Morgan Linnton	Petroleum terminal	NW Portland	13	420,000	
Equilon/Shell	Petroleum terminal	NW Portland	13	400,000	
Pacific Terminal Services	Petroleum terminal	NW Portland	2	275,000	
Recently proposed new terminals or reinvestment in Pacific NW				bbls	Proposal
Vancouver Energy	Crude oil terminal	Vancouver WA	47	NA	2,160,000
Imperium Renewables	Biofuels terminal	Grays Harbor WA	11	NA	720,000
NuStar	Petroleum terminal	Vancouver WA	19	775,000	Reuse tanks
Gaseous fuels					
Existing Portland terminals				LNG gal	2035 forecast
NW Natural GasCo	LNG plant/terminal	NW Portland	41	7,000,000	3,200,000
Recently proposed natural gas terminals/storage in Pacific NW				LNG gal	Proposal
Oregon LNG terminal	New LNG terminal	Warrenton OR	96	NA	84,000,000
Jordan Cove LNG	New LNG terminal	Coos Bay OR	400	NA	84,000,000
NW Natural North Mist	Gas reservoir storage	Mist OR	2,644	NA	2.5 Bcf gas
Other recent proposals (now inactive) for gaseous fuel terminals				LPG gal	Proposal
Pembina	Propane terminal	Portland	38	NA	34,000,000
Haven Energy	Propane terminal	Longview WA	24	NA	23,000,000
NW Innovation	Methanol plant	Kalama WA	83	NA	67,000,000
Coal					
Existing Portland terminals					
None					
Recently proposed coal terminals in Pacific NW					Stockpile acres
Millennium Bulk Terminal	Coal terminal	Longview WA	100	NA	~20
Ambre Energy	Coal transload facility	St. Helens OR		NA	no storage
Gateway Pacific Terminal	Coal terminal	Bellingham WA	334	NA	80

Terminology: bbls = barrels, Dth = decatherms, LNG = liquified natural gas, LPG = liquified propane gas, Bcf = billion cubic feet, AAG = average annual growth.

Sources: Oregon DEQ for petroleum tank data. NW Natural 2014 Integrated Resource Plan for existing capacity and forecast at 1.9% AAG. BST, Portland Harbor Forecast (2012) for petroleum terminals at 1.0% AAG.

Impacts of draft code changes on the economy

Jobs and wages at Portland's fuel terminals

In 2014, the 11 existing fuel terminals in Portland shown in Figure 3 provided approximately 280 jobs at their sites and supported an estimated 720 total jobs in the metropolitan area. The annual payroll at those terminals was $23 million, which supported total personal income of about $92 million in the metropolitan area.

BPS calculated these supported employment and income estimates from the induced and indirect impacts from metropolitan area purchases by these firms and their employees. For example, the jobs of the Longshore Union workers who unload fuels from tankers at these fuel terminals are not counted as direct jobs at the terminal sites. The multipliers used for these calculations were estimated from the average employment and income effects of marine terminals in Portland (Martin Associates, 2012). The job and wage estimates were calculated from Quarterly Census of Employment and Wages (QCEW) data.

Portland's industrial area jobs also have an important urban equity role in that they consist primarily of middle-wage jobs that do not require 4-year college degrees, which the overall economy has been losing since 2000. In contrast, jobs in commercial districts are concentrated primarily in low- and high-wage quartiles (fourths) of overall city employment. Middle-wage job growth supports the "income self-sufficiency" objectives of the Portland Plan and 2035 Comprehensive Plan (Policy 6.28) to expand access to self-sufficient wage levels.

Long-term job growth to 2035 is estimated at 1.6% average annual growth in the warehousing, transportation and utilities sector in Portland's 2016 Economic Opportunities Analysis and Metro's 2014 Urban Growth Report. Applying this growth rate to Portland's existing fuel terminals, approximately 110 net new permanent jobs are expected between 2014 and 2035, which is the equivalent of about four new terminals at their current average size. The total metropolitan area job impact of this fuel terminal expansion would be approximately 290 new jobs by 2035. If fuel terminal job growth occurred at a slower 1.0% average annual rate, matching the forecast growth of liquid bulk cargo volumes in Portland Harbor, approximately 65 net new terminal jobs would be generated by 2035, supporting a total 170 new jobs in the metro area. Pembina's proposed propane terminal in 2014 was estimated to create 30 to 40 new permanent jobs and 600-800 temporary construction jobs.

The proposed code changes would allow for code-limited expansion at existing terminals and new fuel distribution facilities smaller than 5 million gallons to accommodate potential increases in regional demand and resulting job growth.

Tax revenues of new terminals

State and local revenues from income and property taxes vary widely by facility. For example, property taxes on the depreciated improvements value of existing fuel terminals are much lower than new construction. If fuel terminals added 110 net new direct jobs by 2035 and the resulting state and local tax revenues is typical of businesses and developed facilities in Portland's Working Harbor (Martin Associates, 2016), the estimated new state and local tax revenues in fiscal year 2035 (in 2015 dollars) would be $1.6 million. In contrast, the proposed $500 million Pembina project was estimated to generate approximately $12 million in annual property tax revenue, reflecting the increased improvements value and property taxes of new construction.

The proposed code changes would allow for code-limited expansion at existing terminals and new fuel distribution facilities smaller than 5 million gallons and resulting state and local tax revenue. However, prohibiting large scale new terminals such as Pembina could result in similar levels of foregone property taxes. Development of the limited land supply along Portland Harbor for new auto or grain terminals would also result in substantial local and state tax revenues, offsetting foregone taxes on new fossil fuel terminals.

Growth opportunities in fossil fuel distribution

The most recent cargo forecast for Portland Harbor in 2012 projected 1.0% AAG in liquid bulk tonnage to 2040 as a high scenario and 0.5% AAG as a low scenario (BST Associates, 2012). Based on this forecast, ECONorthwest (2012) estimated no additional land need for new liquid bulk terminals. Since 2012, several new fuel terminals have been proposed in the Pacific Northwest, as shown in Figure 2.

Updating the liquid bulk forecast at this point would be challenging for several reasons. Most of the recent fuel terminal proposals have since been abandoned or appear to be dormant. Policy and permitting uncertainty complicate the development feasibility of new terminals and transportation infrastructure. Crude oil prices have fallen sharply in 2015 and 2016, reducing the current market potential for major investments. Expanding global industrial product markets after the Great Recession slowed substantially in 2015. And energy distribution markets could change abruptly with continuing product innovations and location shifts in global production.

In the long term, Portland has competitive advantages for accommodating energy terminal development as a Pacific Rim gateway location to growing Asian markets, the Columbia River's low-gradient railroad access for heavy cargo through the Cascades, and Oregon's freight infrastructure hub. On the other hand, Portland's industrial land supply for continuing growth is limited, and expanding cargo markets for autos, grain and dry bulks are competing for current growth capacity.

Other economic impacts

Energy infrastructure and terminal investments appear to have low but potentially catastrophic risks of major accidents, as described below. Examples include seismic resilience of petroleum terminals in the event of a Cascadia Subduction Zone earthquake, oil train derailments, explosions at LNG (liquefied natural gas) and LPG (liquefied petroleum gas, such as propane) facilities, and others.

Clean Energy is a target industry in the City of Portland. An emerging cluster of Portland area business activity in solar and wind energy manufacturing, green building development, and other fields of sustainable urban innovation present long-term business growth opportunities. Substantial local investment in fossil fuel infrastructure and large new terminals could hinder local growth momentum in Clean Energy industries.

Climate change impacts of draft code changes

Climate impact of fossil fuels

Fossil fuels are major contributors to climate change and pollution, as described in Portland's 2015 Climate Action Plan. Greenhouse gas emissions from the burning of fossil fuels and land use changes, including deforestation, are primary causes of climate change. The Intergovernmental Panel on Climate Change's most recent report documents the overwhelming evidence that human activities have been

the major driver of recent warming of the Earth's surface, and that climate change and its consequences will continue into the future (IPCC, 2013).

The magnitude of future climate impacts depends largely on the trajectory of future global greenhouse gas emissions. Greenhouse gas emissions from human activities have continued to rise in recent decades, reaching the highest rates in human history between 2000 and 2010 (IPCC, 2014). About half of all carbon dioxide emissions, the most prevalent greenhouse gas, between 1750 and 2010 occurred in the last 40 years. The energy, industry and transportation sectors have dominated these emissions increases. On the current trajectory, global transportation emissions will double by 2050.

Transition to "renewable" and "clean" fuels

The U.S. Environmental Protection Agency (USEPA) implements the federal Renewable Fuel Standard (RFS) that requires transportation fuel sold in the U.S. to contain a minimum volume of renewable fuels. The RFS originated with the Energy Policy Act of 2005 and was expanded and extended by the Energy Independence and Security Act of 2007 (EISA). Similarly, the Oregon Department of Environmental Quality (ODEQ)implements the Oregon Clean Fuel Program. ODEQ describes "clean fuel" as a fuel with a lower carbon intensity than that of the fuel it replaces.

Examples of "clean fuels" in Oregon's program include most types of ethanol, biodiesel, natural gas, biogas, electricity, propane and hydrogen. The Oregon Clean Fuel Standard sets 2015 as a baseline that represents 10 percent ethanol blended with gasoline and 5 percent biodiesel blended with diesel. The rule also requires a 10 percent reduction in average carbon intensity from 2015 levels by 2025.

Terminal representatives and business stakeholders urged that proposed zoning code changes not create a disincentive or barrier to compliance with these federal and state rules, which may require additional tank capacity to implement. Environmental and public health organization representatives pointed out that City Resolution 37168 addresses fossil fuels generally, including lower-carbon fossil fuels like natural gas and propane. The proposed code changes would allow for code-limited expansion at existing terminals and are not expected to hinder compliance with the renewable and clean fuel standards, as described in Section 5.

Velocity of transition to non-fossil fuel energy

Portland's Climate Action Plan sets a goal for an 80% reduction in greenhouse gas emissions by 2050. Oregon's climate action goals similarly call for 75% reduction by 2050. While fossil fuels like natural gas and propane have the potential to replace higher-carbon fuels, they don't begin to approach the 80% reduction that the City is striving for or the State's 75% goal. ODEQ estimates that the greenhouse gas emissions reduction from switching from gasoline to compressed natural gas, for example, is 18%; for propane, it is 15%. The lower-carbon fossil fuels do have appeal as a bridge to widespread use of renewable energy, but investments in major infrastructure typically take decades to recoup, and the transition to renewables needs to go much faster than that to stabilize global emissions.

During recent hearings and analysis on Resolution 37168 and the Pembina terminal proposal, the question of whether to differentiate between fossil fuels with different carbon content was widely

discussed. In the lead up to the resolution, an option was proposed that would oppose new coal and oil infrastructure but allow for other fossil fuels that could show a likely net decrease in carbon emissions. City Council decided not to apply this option in the resolution.

Health, safety and environmental impacts of draft code changes

Seismic resilience and liquefaction soils

The 2035 Comprehensive Plan sets policy direction (4.75 and 4.76) to encourage disaster-resilient development and specifically to reduce natural hazard risks to critical energy and transportation infrastructure in Portland Harbor.

The 2016 Critical Energy Infrastructure Hub Study underway by the Portland Bureau of Emergency Management includes a literature review and modeled risks of structural damage to critical infrastructure from earthquakes, floods, landslides, volcanic activity, wildfire and other sources. Along with petroleum and natural gas infrastructure, the study is also assessing infrastructure risks to emergency services, transportation, electricity, potable water and waste water. The study area includes the Northwest and Linnton industrial areas. PBEM has identified significant seismic risks at the fuel terminals from a major Cascadia Subduction Zone earthquake because of their location in a filled riverfront plateau area with moderate- to high-susceptibility location for soil liquefaction.

As shown in Figure 7, the Oregon Department of Geology and Mineral Industries (DOGAMI) has mapped most of the riverfront plateau areas, which account for over 90 percent of Portland's industrial zoning, as having high susceptibility for soil liquefaction, along with areas along the Central City riverfront and much of the Brooklyn and Sellwood-Moreland neighborhoods. Most of the existing fuel terminals in the Willbridge area are mapped as having moderate susceptibility for soil liquefaction, and the others are mapped in the high susceptibility areas. The proposed code amendments will improve the seismic resilience of new bulk fossil fuel terminals by precluding their development in areas with high susceptibility to soil liquefaction.

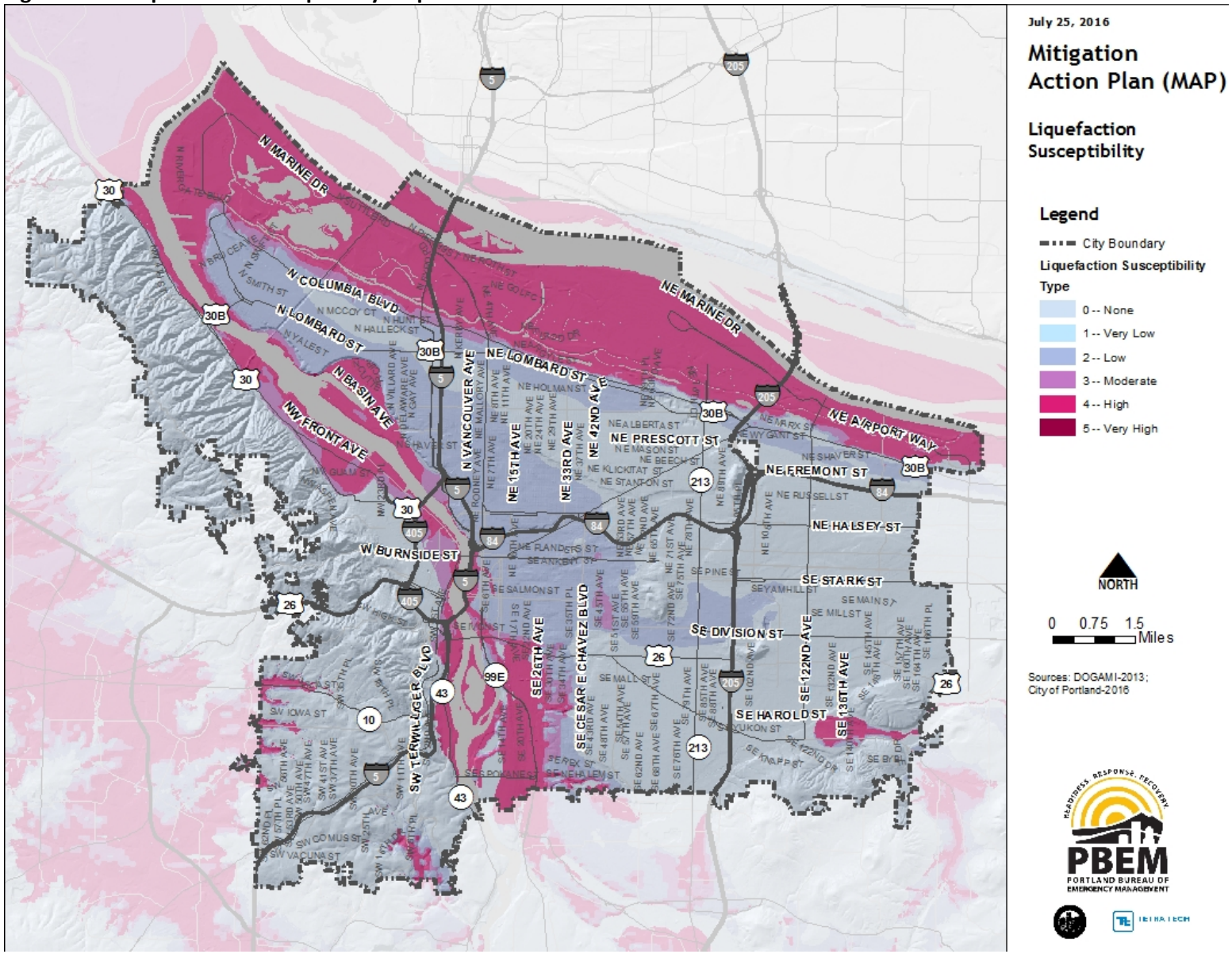
The proposed code changes provide for seismic improvements to existing terminals, through a Nonconforming Situation Review. Future amendments to building and fire codes to improve seismic safety of fossil fuel infrastructure may also be adopted to implement Resolution 37168. A future code project is recommended in Section 7 to develop building code amendments to improve seismic resilience and require seismic upgrades comparable to proposed requirements on unreinforced masonry buildings.

Safety of liquefied gas terminals

Liquefied natural gas (LNG) and liquefied petroleum gas (LPG), such as propane, facilities pose safety risks from potential explosions and fire. The Pembina propane terminal, which was proposed in 2015 at the Port of Portland Terminal 6, is an apt case study. The Pembina terminal would have required environmental zoning code amendments that did not move forward.

The issue of safety risks was discussed extensively during review of the proposed Pembina terminal, and a quantitative risk assessment study was prepared to inform that review process (Det Norske Veritas (U.S.A.), Inc., 2015). The study estimated the risk from flammable releases, such as jet fires, pool fire, flash fire, vapor cloud explosions, fireball and Boiling Liquid Expanding Vapor Explosion (BLEVE).

Figure 8. Soil liquefaction susceptibility map of Portland



The risk was presented as individual risk in the form of location-specific risk contours extending outward from the proposed facilities, and as societal risk in the form of potential loss of life and cumulative frequency of various accidents. The highest offsite risk level was found to be 1 fatality in 1,000 years in areas directly north and south of facility. The nearest residential zones are located beyond the risk level contour of 1 fatality in 100 million years. The cumulative societal risk was estimated at 1 statistical fatality every 38 years. The study also included various facility design and siting recommendations to mitigate identified risks.

Another risk assessment (Northwest Citizen Science Initiative, 2015) on the Pembina project was presented by environmental groups and neighbors including the Hayden Island Neighborhood Association. The analysis identifies additional sources of risk from BLEVE cascades, terrorist events and magnitude 9 earthquakes. The authors recommend not locating a propane terminal within 10 miles of the Portland/Vancouver urban area.

Public safety risks from a new LNG or LPG facility are estimated to be very low relative to other urban hazards, although possible impacts could be catastrophic. The proposed code amendments are expected to reduce public safety risks by prohibiting development of large new LNG or LPG facilities.

Oil train accidents

On June 3, 2016 an oil train traveling through the Columbia River Gorge partially derailed in Mosier en route to Tacoma. The 16-car derailment resulted in a 1,000-barrel spill and fires that lasted nearly a day. Small amounts of oil reportedly reached the river, and nearby drinking water and wastewater facilities in Mosier were affected.

An Associated Press analysis of accident records found that 26 oil-train derailments or fires have occurred nationally in the last decade. The national geography of increasing oil extraction in the inland Great Plains states and refineries concentrated on the coasts is contributing to this trend. Risk of how often such derailments are likely to occur in the Columbia Gorge is disputed, with one estimate as high as one every 30 months.

Preliminary reporting on the cause of the Mosier derailment pointed to failed bolts in the track that are difficult to detect. Union Pacific reported that improvements are underway to replace bolts on 530 miles of curved track nationwide. Railroad safety is regulated at the federal level and monitored by the Federal Railroad Administration. A recent Government Accounting Office report has identified challenges and delays in implementing some federal rail safety regulations.

The proposed code amendments could incrementally reduce rail accident risks by restricting development and expansion of fossil fuel terminals at a West Coast rail hub location. However, restricting the location of new petroleum terminals in the city of Portland is not expected to substantially affect the volume of petroleum cargo transported by rail to Puget Sound refineries. The Portland/Vancouver area is a rail hub location, where West Coast rail lines running north-south intersect the low gradient east-west rail corridor along both sides of the Columbia River. Roughly half of the east-west rail cargo destined for the Seattle-Tacoma area, in addition to Oregon-bound rail cargo, moves through the Portland metropolitan area. Derailment risk within Portland is reduced by the numerous siding destinations and congestion of the “Portland Triangle” area where UP and BNSF lines come together. However, derailment risks to natural resources, especially along rivers, and to rural communities appear to be significant.

5. Code concepts and analysis

This section of the report describes the proposed zoning change concepts by topic area, including the related policy directions, implementation issues, and rationale for the proposed zoning changes.

1. **Types of distribution and storage facilities to be regulated**

Policy direction:

- City Council Resolution 37168 (adopted November 2015) calls for opposing expansion of infrastructure for transportation and storage of fossil fuels, subject to various exceptions, including safety improvements, service to end users, and infrastructure that accelerates transition to non-fossil fuel energy.
- 2035 Comprehensive Plan Policy 6.48 Fossil Fuel Infrastructure (adopted June 2016, not effective until 2018) also calls for limiting fossil fuel distribution and storage facilities to those necessary to serve the regional market.

Preliminary code concepts:

- Limit development of new Bulk Fossil Fuel Terminals as a regulated land use.
- Bulk Fossil Fuel Terminals are engaged in freight movement or wholesaling of fossil fuels at facilities that are characterized by having (1) marine, pipeline or railroad transport access and (2) either transloading facilities for transferring a shipment between transport modes (such as from rail to ship) or bulk storage facilities exceeding 5 million gallons (or equivalent volume) of fossil fuels. Examples include petroleum terminals, liquid natural gas terminals, and coal terminals. Functionally, these terminals are typically regional gateway facilities, where fossil fuels enter and exit the region, but the use classification is intended to be clearly identifiable and not rely on a definition of region.
- Exceptions that are not Bulk Fossil Fuel Terminals:
    - Retail sales of fossil fuels, such as gasoline or propane filling stations;
    - Distributors, wholesalers, and industrial service uses that receive and deliver fossil fuels exclusively by truck;
    - End-user facilities that store fossil fuels for primary use at or near the site, such as manufacturing, agriculture, and airports;
    - Uses that recover or reprocess used petroleum products;
    - Waste-related uses that transfer or store solid or liquid wastes, such as landfills.

Implementation issues:

- Definition of region – Portland is a regional distribution hub for energy and other products, and this zoning change is not intended to restrict energy access to the growing region. However, the regional market area of Bulk Fossil Fuel Terminals varies by product and is difficult to define. Portland's 10 petroleum terminals generally serve Oregon and Southern Washington. This market area substantially exceeds the Portland metropolitan area, which is often colloquially referred to as the region. Some terminal representatives pointed out that the federal government's 5-state West Coast PADD 5 region is generally their regional market area. Bureau

of Development Services (BDS) staff commented that zoning does not regulate the target market (destination) of wholesale products, and the zoning code does not define region. Business organization representatives commented that the energy markets and related market areas are likely to change over time. Therefore, the proposed land use incorporates the concept of a regional market into the size limits, and a zoning definition of region is not proposed here.

- End users – Resolution 37168 lists a specific exception to not restrict service directly to end users. At a small scale, services to end users include retail gasoline filling stations, natural gas access lines in street right-of-way to residential and business customers, and heating oil tanks at home sites. Larger scale end users with fossil fuel storage and access infrastructure also include manufacturers, jet fuel facilities at the PDX Airport, vessel fuel facilities on Portland Harbor, and others where fossil fuels are used as an input. Again, the limits on new facilities are sized to apply only to larger distribution facilities.

- Interpretation of use category – Terminal and business representatives commented that ambiguity in the use description could result in conflicting expectations, pressured interpretations, appeals, and inconsistent code implementation. While underlying policy accommodates regional access and exceptions that may be difficult to clearly define, the land use designation is proposed to be defined by clear and objective size thresholds and marine/railroad/pipeline access.

2. **Definition of fossil fuels**

Policy direction: City Council Resolution 37168 applies to fossil fuel infrastructure and storage generally, and does not distinguish among types or carbon intensity of fossil fuels.

Preliminary code concept:

- Definition of fossil fuels: petroleum products (such as crude oil and gasoline), coal, and gaseous fuels (such as natural gas and propane) that are made from decayed plants and animals that lived millions of years ago and are used primarily as a source of energy.
- Exclusion of non-fuel products – Petrochemicals that are used primarily for non-fuel products are excluded, such as plastics, lubricants, fertilizer, roofing and paints.
- Methanol is included as a fossil fuel. Development of methanol storage and transportation facilities would be prohibited similarly to LNG and LPG terminals.
- Denatured ethanol and similar fuel additives and biodiesel/renewable diesel with less than 5% fossil fuel content are not fossil fuels.
- Biogas from wastewater treatment plants, anaerobic digesters, landfills and other sources is not a fossil fuel.

Implementation issues:

- Definition of fossil fuels – Definitions of fossil fuels vary by source. Here are some examples.
    - Oregon Department of Environmental Quality (ODEQ) – Fossil fuels: fuels such as oil, natural gas, and coal that are made from decayed plants and animals that lived millions of years ago. These fuels are made of hydrogen and carbon (hydrocarbons).

- U.S. Environmental Protection Agency (USEPA), 40 C.F.R. § 60.41 - Fossil fuel means natural gas, petroleum, coal, and any form of solid, liquid, or gaseous fuel derived from such materials for the purpose of creating useful heat.
- Oregon Department of Energy Administrative Rule, OAR 345-001-0010 - "Fossil fuel" means natural gas, petroleum, coal and any form of solid, liquid or gaseous fuel derived from such materials that serves as useful energy.

- Renewable and clean fuel standards – As described in Section 4, USEPA implements the federal Renewable Fuel Standard (RFS) that requires transportation fuel sold in the U.S. to contain a minimum volume of renewable fuels. Similarly, ODEQ implements the Oregon Clean Fuel Program. ODEQ identifies examples of "clean fuels" in Oregon as most types of ethanol, biodiesel, natural gas, biogas, electricity, propane and hydrogen. Terminal representatives and business stakeholders urged that proposed zoning code changes not create a disincentive or barrier to compliance with these federal and state rules, which may require additional tank capacity to implement. Environmental and public health organization representatives pointed out that City Resolution 37168 addresses fossil fuels generally, including clean fuels. The proposed allowance for code-limited expansion of existing terminals will allow enough supply to comply with the renewable and clean fuel standards.

- *Methanol – Large methanol plants have recently been proposed in Tacoma, Kalama, and St. Helens. Methanol plants tend to have structural similarities to LNG and LPG terminals, including large-scale and gas pipeline access, and they can have similar safety and climate impacts. Stakeholder focus groups were asked whether any* special inclusions, such as methanol, should be considered. Most people commenting noted that methanol is primarily used in the production of plastics and other non-fuel uses. Views differed among environmental organizations commenting. Some noted that excluding it undermines the policy. The proposed code limits development of large methanol plants similarly to LNG or LPG terminals.

- *Denatured ethanol* – A terminal operator pointed out that "pure" ethanol made from corn or other non-fossil source is required by the Alcohol and Tobacco Tax and Trade Bureau to be denatured in order to be transported to the site. Denatured ethanol typically contains up to 5% methanol, so that it is toxic and undrinkable. Storage of denatured ethanol is proposed to be exempted. In other words, denatured ethanol tanks would not be counted as part of the maximum storage capacity of fossil fuel terminals.

- Biogas products from landfills – Bureau of Environmental Services (BES) staff commented that biogas from landfills and other sources are not fossil fuels and should not be restricted by the proposed zoning changes. The proposed description of fossil fuel terminals specifically excludes waste-related uses, such as landfills, which are regulated as a separate land use in the zoning code. Also, the proposed definition of fossil fuels, described as being made from decayed plants and animals that lived millions of years ago, would not include biogas from a landfill.

3. **Prohibition of bulk fossil fuel terminals**

Policy direction:

- City Council Resolution 37168 (adopted November 2015) calls for opposing expansion of infrastructure for transportation and storage of fossil fuels, subject to various exceptions, including safety improvements, service to end users, and infrastructure that accelerates transition to non-fossil fuel energy.
- 2035 Comprehensive Plan Policy 6.48 Fossil Fuel Infrastructure (adopted June 2016, not effective until 2018) also calls for limiting fossil fuel distribution and storage facilities to those necessary to serve the regional market.

Preliminary code concept:

- Classify Bulk Fossil Fuel Terminals as a prohibited use in all base zones.

Implementation issues:

- Policy implementation – City Resolution 37168 reflected a major change in policy direction on fossil fuel distribution and storage facilities. Prohibition of Bulk Fossil Fuel Terminals is proposed as an unambiguous, assertive approach to implement this policy change, responding to increasingly evident safety risks of fossil fuel infrastructure, aggressive climate change goals, and changing energy markets in the Pacific Northwest.

- Community expectations – Over 700 people sent emails in response to the Discussion Draft asking for a "full ban" on new and expanded fossil fuel terminals. Climate resilience advocates are widely represented in the Portland community and the Pacific Northwest. Public involvement in Resolution 37168 and this project reveal broad community expectations for a bold approach to restrict fossil fuel distribution facilities in Portland.

- Providing regional market access to fuels – Analysis to date is limited on the potential impacts of the prohibition on constraining regional fuel supply. Fossil fuel demand in this growing region may increase moderately, as indicated by trend-based forecasts, or may plateau and decline with implementation of climate resilience goals and strategies. Staff will continue to research and analyze potential economic impacts of proposed code changes prior to adoption. The fossil fuels consumed in Oregon are generally not extracted or refined in the state. As a result, fossil fuel terminals provide multimodal transportation efficiency and price advantages for distributing fuels to the growing population of the regional market area.

- Option to set size limits on new fossil fuel terminals – The Discussion Draft proposed storage capacity size standards to limit new fossil fuel terminal development. Figure 7 in Section 4 indicates a wide margin between the size of recently proposed crude oil, coal and LNG terminals proposed in the Pacific Northwest and the scale of expected growth by existing Portland fuel terminals that serve the regional market area. Proposed terminal size limitations within that margin would allow for expansion at existing terminals and moderately sized new terminal development to meet potential market area consumption needs. Instead, the Proposed Draft code changes would prohibit Bulk Fossil Fuel Terminals, a more restrictive approach to more

assertively implement the new policy directions and respond to extensive community comments on the proposed code changes. Existing terminals can expand and make safety and seismic upgrades to their facilities within their current sites, providing the opportunity to meet potential market area consumption needs.

- Balanced, integrated policy approach – The proposed restrictions on fossil fuel distribution facilities entail tradeoffs among public goals for environmental protection, public health and safety, meeting energy needs, and economic prosperity, as described in Section 4. The Comprehensive Plan calls for a balanced, integrated approach in land use regulations to meet these public objectives, as described in Section 2. The proposed code changes provide for significant environmental and safety benefits in restricting development and expansion of fossil fuel terminals and provide for limited expansion of fossil fuel terminals to adequately meet regional energy needs and integrate economic prosperity and equity considerations.

4. Legal, nonconforming status of existing facilities

Policy direction:

- City Council Resolution 37168 includes various exemptions to not restrict safety or efficiency improvements, service to end users, emergency backup capacity, infrastructure for recovery or re-processing of used petroleum products, or infrastructure that will accelerate the transition to non-fossil fuel energy sources.
- 2035 Comprehensive Plan Policy 6.48 Fossil Fuel Infrastructure (adopted June 2016, not effective until 2018) also calls for limiting fossil fuel distribution and storage facilities to those necessary to serve the regional market.
- 2035 Comprehensive Plan Policies 4.75 and 4.76 call for encouraging disaster-resilient development and reducing natural hazard risks to critical energy and transportation infrastructure in Portland Harbor.

Preliminary code concept:

- Existing Bulk Fossil Fuel Terminals would become legal, non-conforming uses, which may continue to operate. Expansion would require approval through a nonconforming situation review, which is a Type II discretionary land use review. The Type II procedure is an administrative process with the opportunity for public notice and comment. The Director of the Bureau of Development Services makes the initial decision, which can be appealed to a City Hearings Officer, whose decision in turn can be appealed to the State Land Use Board of Appeals (LUBA).

Implementation issues:

- Flexibility for code-limited expansion - Significant improvements to non-conforming uses generally require a "nonconforming situation review." Given this requirement, the proposed code changes may be more restrictive than the exceptions in the resolution that call for not restricting improvements at existing fuel terminals that improve safety, provide wholesale fuel supply to local or regional end users, add backup capacity, or add tanks for clean/renewable fuels would require approval through a nonconforming situation review. However, the Zoning Code's provisions for expansion of nonconforming uses do provide discretionary flexibility to accommodate such improvements. Approval criteria for a nonconforming situation review

include that, with mitigation measures, there will be no net increase in overall detrimental impacts on the surrounding industrial zone (such as hours of operation and vehicle trips) and the expansion will not detract from the desired function and character of the industrial zone. Terminal improvements would also be limited to their existing site area. Improvements that address the exceptions in the resolution are not generally expected to result in additional detrimental impacts on the surrounding industrial zone. Given the level of community scrutiny about fossil fuel terminal expansion, this discretionary public review process could add to the cost and uncertainty of investments at fossil fuel terminals. Nonconforming situation reviews are "Type 2" staff level permits, which could be appealed to a hearings officer and further to the Land Use Board of Appeals.

- Option to not restrict expansion at existing terminals - The Discussion Draft proposed code concepts (storage capacity size standards to limits new fossil fuel terminal development) that would not restrict development on existing terminals. This option was intended to be consistent with the exceptions in the resolution (as described in the previous point) and to accommodate potential growth in regional fuel demand. Instead, the Proposed Draft code changes would apply a legal, non-conforming use status on existing Bulk Fossil Fuel Terminals, a more restrictive approach to more assertively implement the new policy directions and respond to extensive community comments on the proposed code changes.

- Divergent stakeholder views – Extensive comments on the Discussion Draft recommended tight limits on expansion of existing fuel terminals. In contrast, stakeholder focus group participants generally urged that existing fuel terminals should not be changed to a non-conforming use for reasons ranging from providing a critical product to not discouraging desired seismic and safety improvements on existing facilities. Stakeholder group comments from environmental and public health organizations generally supported restricting expansion of existing terminals, while some participants cautioned about political and legal tradeoffs of making the existing fuel terminals nonconforming.

6. Zoning code changes

This section of the report specifies the draft code language, along with code commentary pages that clarify expected implementation. The section is formatted to facilitate readability, showing proposed code changes on the right-hand pages and related code commentary on the facing left-hand pages.

Commentary

Table 100-1 Open Space Zone Primary Uses

The amendments to this table reflect changes to prohibit Bulk Fossil Fuel Terminals in all base zones.

Table 100-1 Open Space Zone Primary Uses	
Use Categories	**OS Zone**
Residential Categories	
Household Living	N
Group Living	N
Commercial Categories	
Retail Sales And Service	CU [1]
Office	N
Quick Vehicle Servicing	N
Vehicle Repair	N
Commercial Parking	N
Self-Service Storage	N
Commercial Outdoor Recreation	CU
Major Event Entertainment	N
Industrial Categories	
Manufacturing And Production	CU [6]
Warehouse And Freight Movement	N
Wholesale Sales	N
Industrial Service	N
Bulk Fossil Fuel Terminal	N
Railroad Yards	N
Waste-Related	N
Institutional Categories	
Basic Utilities	L/CU [5]
Community Service	CU [4]
Parks And Open Areas	L/CU [2]
Schools	CU
Colleges	N
Medical Centers	N
Religious Institutions	N
Daycare	CU
Other Categories	
Agriculture	L[7]
Aviation And Surface Passenger Terminals	N
Detention Facilities	N
Mining	CU
Radio Frequency Transmission Facilities	L/CU [3]
Rail Lines And Utility Corridors	CU

Y = Yes, Allowed L = Allowed, But Special Limitations CU = Conditional Use Review Required
N = No, Prohibited

Commentary

Table 110-1 Single-Dwelling Zone Primary Uses

The amendments to this table reflect changes to prohibit Bulk Fossil Fuel Terminals in all base zones.

Table 110-1 Single-Dwelling Zone Primary Uses						
Use Categories	**RF**	**R20**	**R10**	**R7**	**R5**	**R2.5**
Residential Categories						
Household Living	Y	Y	Y	Y	Y	Y
Group Living	CU	CU	CU	CU	CU	CU
Commercial Categories						
Retail Sales And Service	N	N	N	N	N	N
Office	N	N	N	N	N	N
Quick Vehicle Servicing	N	N	N	N	N	N
Vehicle Repair	N	N	N	N	N	N
Commercial Parking	N	N	N	N	N	N
Self-Service Storage	N	N	N	N	N	N
Commercial Outdoor Recreation	N	N	N	N	N	N
Major Event Entertainment	N	N	N	N	N	N
Industrial Categories						
Manufacturing And Production	CU [6]	N	N	N	N	N
Warehouse And Freight Movement	N	N	N	N	N	N
Wholesale Sales	N	N	N	N	N	N
Industrial Service	N	N	N	N	N	N
Bulk Fossil Fuel Terminal	N	N	N	N	N	N
Railroad Yards	N	N	N	N	N	N
Waste-Related	N	N	N	N	N	N
Institutional Categories						
Basic Utilities	L/CU [5]	L/CU [5]	L/CU [5]	L/CU [5]	L/CU [5]	L/CU [5]
Community Service	CU [1]	CU [1]	CU [1]	CU [1]	CU [1]	CU [1]
Parks And Open Areas	L/CU [2]	L/CU [2]	L/CU [2]	L/CU [2]	L/CU [2]	L/CU [2]
Schools	CU	CU	CU	CU	CU	CU
Colleges	CU	CU	CU	CU	CU	CU
Medical Centers	CU	CU	CU	CU	CU	CU
Religious Institutions	CU	CU	CU	CU	CU	CU
Daycare	L/CU [3]	L/CU [3]	L/CU [3]	L/CU [3]	L/CU [3]	L/CU [3]
Other Categories						
Agriculture	L [7]	L [7]	L/CU [8]	L/CU [8]	L [9]	L [9]
Aviation And Surface Passenger Terminals	CU	N	N	N	N	N
Detention Facilities	N	N	N	N	N	N
Mining	CU	N	N	N	N	N
Radio Frequency Transmission Facilities	L/CU [4]	L/CU [4]	L/CU [4]	L/CU [4]	L/CU [4]	L/CU [4]
Railroad Lines And Utility Corridors	CU	CU	CU	CU	CU	CU

Y = Yes, Allowed
L = Allowed, But Special Limitations
CU = Conditional Use Review Required
N = No, Prohibited

Commentary

Table 120-1 Multi-Dwelling Zone Primary Uses

The amendments to this table reflect changes to prohibit Bulk Fossil Fuel Terminals in all base zones.

Table 120-1 Multi-Dwelling Zone Primary Uses						
Use Categories	**R3**	**R2**	**R1**	**RH**	**RX**	**IR**
Residential Categories						
Household Living	Y	Y	Y	Y	Y	Y
Group Living	L/CU [1]	L/CU [1]	L/CU [1]	L/CU [1]	L/CU [1]	Y [1]
Commercial Categories						
Retail Sales And Service	N	N	N	CU[2]	L/CU [3]	L/CU [10]
Office	N	N	N	CU[2]	L/CU [3]	L/CU [10]
Quick Vehicle Servicing	N	N	N	N	N	N
Vehicle Repair	N	N	N	N	N	N
Commercial Parking	N	N	N	N	CU [4]	N
Self-Service Storage	N	N	N	N	N	N
Commercial Outdoor Recreation	N	N	N	N	N	N
Major Event Entertainment	N	N	N	N	N	CU
Industrial Categories						
Manufacturing And Production	N	N	N	N	N	CU
Warehouse And Freight Movement	N	N	N	N	N	N
Wholesale Sales	N	N	N	N	N	N
Industrial Service	N	N	N	N	N	CU
Bulk Fossil Fuel Terminal	N	N	N	N	N	N
Railroad Yards	N	N	N	N	N	N
Waste-Related	N	N	N	N	N	N
Institutional Categories						
Basic Utilities	L/CU [13]	L/CU [13]	L/CU [13]	L/CU [13]	L/CU [13]	L/CU [13]
Community Service	CU [6]	CU [6]	CU [6]	L/CU [6]	L/CU [5, 6]	CU [6]
Parks And Open Areas	L/CU [7]	L/CU [7]	L/CU [7]	Y	Y	Y
Schools	CU	CU	CU	CU	L/CU [5]	L/CU [11]
Colleges	CU	CU	CU	CU	CU	L/CU [11]
Medical Centers	CU	CU	CU	CU	CU	L/CU [11]
Religious Institutions	CU	CU	CU	CU	CU	CU
Daycare	L/CU [8]	L/CU [8]	L/CU [8]	L/CU [8]	Y	L/CU [12]
Other Categories						
Agriculture	L [14]	L [14]	L [14]	L [14]	L [14]	L [14]
Aviation And Surface Passenger Terminals	N	N	N	N	N	N
Detention Facilities	N	N	N	N	N	N
Mining	N	N	N	N	N	N
Radio Frequency Transmission Facilities	L/CU [9]	L/CU [9]	L/CU [9]	L/CU [9]	L/CU [9]	L/CU [9]
Rail Lines And Utility Corridors	CU	CU	CU	CU	CU	CU

Y = Yes, Allowed
L = Allowed, But Special Limitations
CU = Conditional Use Review Required
N = No, Prohibited

Commentary

Table 130-1 Commercial Zone Primary Uses

The amendments to this table reflect changes to prohibit Bulk Fossil Fuel Terminals in all base zones.

Table 130-1 Commercial Zone Primary Uses								
Use Categories	**CN1**	**CN2**	**CO1**	**CO2**	**CM**	**CS**	**CG**	**CX**
Residential Categories								
Household Living	Y	Y	Y	Y	Y	Y	Y	Y
Group Living	L/CU [1]	L/CU [1]	L/CU [1]	L/CU [1]	L/CU [1]	L/CU [1]	L/CU [1]	L/CU [1]
Commercial Categories								
Retail Sales And Service	L [2]	Y	N	L [3]	L [4]	Y	Y	Y
Office	L [2]	Y	Y	Y	L [4]	Y	Y	Y
Quick Vehicle Servicing	N	L [12]	N	N	N	N	Y	L [12]
Vehicle Repair	N	N	N	N	N	Y	Y	L [5]
Commercial Parking	N	N	N	N	N	Y	CU [11]	CU [11]
Self-Service Storage	N	N	N	N	N	N	L [6]	L [6]
Commercial Outdoor Recreation	N	N	N	N	Y	Y	Y	Y
Major Event Entertainment	N	N	N	N	N	CU	CU	Y
Industrial Categories								
Manufacturing And Production	L/CU [2]	L/CU [2]	N	N	L/CU [4, 5]	L/CU [5]	L/CU [5,7]	L/CU [5]
Warehouse And Freight Movement	N	N	N	N	N	N	CU [5,7]	N
Wholesale Sales	N	N	N	N	L [4, 5]	L [5]	L [5,7]	L [5]
Industrial Service	N	N	N	N	N	CU [5]	CU [5,7]	CU [5]
Bulk Fossil Fuel Terminal	N	N	N	N	N	N	N	N
Railroad Yards	N	N	N	N	N	N	N	N
Waste-Related	N	N	N	N	N	N	N	N
Institutional Categories								
Basic Utilities	Y/CU [10]	Y/CU [10]	Y/CU [10]	Y/CU [10]	Y/CU [10]	Y/CU [10]	Y/CU [10]	Y/CU [10]
Community Service	L/CU [8]	L/CU [8]	L/CU [8]	L/CU [8]	L/CU [8]	L/CU [8]	L/CU [8]	L/CU [8]
Parks And Open Areas	Y	Y	Y	Y	Y	Y	Y	Y
Schools	Y	Y	Y	Y	Y	Y	Y	Y
Colleges	Y	Y	Y	Y	Y	Y	Y	Y
Medical Centers	Y	Y	Y	Y	Y	Y	Y	Y
Religious Institutions	Y	Y	Y	Y	Y	Y	Y	Y
Daycare	Y	Y	Y	Y	Y	Y	Y	Y

Commentary

Other Categories								
Agriculture	L [13]	L [13]	L [13]	L [13]	L [13]	L/CU [14]	L/CU [14]	L/CU [14]
Aviation And Surface Passenger Terminals	N	N	N	N	N	N	CU	CU
Detention Facilities	N	N	N	N	N	N	CU	CU
Mining	N	N	N	N	N	N	N	N
Radio Frequency Transmission Facilities	L/CU [9]	L/CU [9]	L/CU [9]	L/CU [9]	L/CU [9]	L/CU [9]	L/CU [9]	L/CU [9]
Rail Lines And Utility Corridors	CU	CU	CU	CU	CU	CU	CU	CU

Y = Yes, Allowed
L = Allowed, But Special Limitations
CU = Conditional Use Review Required
N = No, Prohibited

Commentary

Table 140-1 Employment and Industrial Zone Primary Uses

The amendments to this table reflect changes to prohibit Bulk Fossil Fuel Terminals in all base zones.

Table 140-1 Employment and Industrial Zone Primary Uses						
Use Categories	**EG1**	**EG2**	**EX**	**IG1**	**IG2**	**IH**
Residential Categories						
Household Living	CU	CU	Y	CU [1]	CU [1]	CU [1]
Group Living	CU	CU	L/CU [2]	N	N	N
Commercial Categories						
Retail Sales And Service	L/CU [3]	L/CU [3]	Y	L/CU [4]	L/CU [5]	L/CU [6]
Office	L [3]	L [3]	Y	L/CU [4]	L/CU [5]	L/CU [6]
Quick Vehicle Servicing	Y	Y	N	Y	Y	Y
Vehicle Repair	Y	Y	Y	Y	Y	Y
Commercial Parking	CU [15]	CU [15]	CU [15]	CU [15]	CU [15]	CU [15]
Self-Service Storage	Y	Y	L [7]	Y	Y	Y
Commercial Outdoor Recreation	Y	Y	Y	CU	CU	CU
Major Event Entertainment	CU	CU	CU	CU	CU	CU
Industrial Categories						
Manufacturing And Production	Y	Y	Y	Y	Y	Y
Warehouse And Freight Movement	Y	Y	Y	Y	Y	Y
Wholesale Sales	Y	Y	Y	Y	Y	Y
Industrial Service	Y	Y	Y	Y	Y	Y
Bulk Fossil Fuel Terminal	N	N	N	N	N	N
Railroad Yards	N	N	N	Y	Y	Y
Waste-Related	N	N	N	L/CU [8]	L/CU [8]	L/CU [8]
Institutional Categories						
Basic Utilities	Y/CU [12]	Y/CU [12]	Y/CU [12]	Y/CU [13]	Y/CU [13]	Y/CU 13]
Community Service	L [9]	L [9]	L [10]	L/CU [11]	L/CU [11]	L/CU [11]
Parks And Open Areas	Y	Y	Y	Y	Y	Y
Schools	Y	Y	Y	N	N	N
Colleges	Y	Y	Y	N	N	N
Medical Centers	Y	Y	Y	N	N	N
Religious Institutions	Y	Y	Y	N	N	N
Daycare	Y	Y	Y	L/CU [11]	L/CU 11]	L/CU 11]
Other Categories						
Agriculture	L [16]	L [16]	L [16]	L [16]	L [16]	L [16]
Aviation And Surface Passenger Terminals	CU	CU	CU	CU	CU	CU
Detention Facilities	CU	CU	CU	CU	CU	CU
Mining	N	N	N	CU	CU	CU
Radio Frequency Transmission Facilities	L/CU [14]	L/CU [14]	L/CU [14]	L/CU [14]	L/CU 14]	L/CU 14]
Rail Lines And Utility Corridors	Y	Y	Y	Y	Y	Y

Y = Yes, Allowed
L = Allowed, But Special Limitations
CU = Conditional Use Review Required
N = No, Prohibited

Commentary

33.910.030 Definitions

The definition of fossil fuels was added to clarify the land use category Bulk Fossil Fuel Terminals.

Petrochemicals that are used primarily for non-fuel products are excluded, such as plastics, lubricants, fertilizer, roofing, and paints. However, methanol is an exception that is included as a fossil fuel, because large methanol storage and distribution facilities tend to have structural similarities to liquid natural gas (LNG) and liquid petroleum gas (LPG) terminals, including large-scale storage and gas pipeline access, and because they can have similar safety and climate impacts.

Fuels containing 5% or less fossil-fuel volume are not considered fossil fuels under this definition. For example, "pure" ethanol made from corn or other non-fossil source is required by the Alcohol and Tobacco Tax and Trade Bureau to be denatured in order to be transported to the site. Denatured ethanol typically contains up to 5% methanol, so that it is toxic and undrinkable.

Some fossil fuels under this definition are also classified as "renewable fuels" in the federal Renewable Fuel Standard and "clean fuels" in Oregon's Clean Fuel Standard, such as liquid natural gas and liquid propane gas. These federal and state standards require transportation fuel sold within their jurisdiction to contain a minimum volume of renewable or clean fuels.

33.910.030 Definitions

The definition of words with specific meaning in the zoning code are as follows:

Fossil Fuel. Fossil fuels are petroleum products (such as crude oil and gasoline), coal, and gaseous fuels (such as natural gas, methanol, and propane) that are made from decayed plants and animals that lived millions of years ago and are used as a source of energy. Denatured ethanol and similar fuel additives and biodiesel/renewable diesel with less than 5% fossil fuel content are not fossil fuels.

Commentary

33.920 Descriptions of the Use Categories

920

Sections:

Commentary

33.920.300 Bulk Fossil Fuel Terminal

Bulk Fossil Fuel Terminals are added as a new land use category to regulate their development in the Zoning Code. Regulation of Bulk Fossil Fuel Terminals implements policy direction in City of Portland Resolution 37168 (adopted November 2015) and 2035 Comprehensive Plan Policy 6.48 (adopted June 2016, expected to take effect in 2018), both of which address fossil fuel distribution and storage facilities.

Bulk Fossil Fuel Terminals are characterized by having (1) marine, pipeline or railroad transport access and (2) either trans-loading facilities for transferring a shipment between transport modes (such as from rail to ship) or bulk storage facilities exceeding 5 million gallons (or equivalent) of fossil fuels. Functionally, these terminals tend to be regional gateway facilities, where fossil fuels enter and exit the region. Additionally, Policy 6.48 calls for limiting fossil fuel distribution and storage facilities to those necessary to serve the regional market. However, the use classification is intended to be clearly identifiable by physical characteristics and not rely on a definition of region.

The regional market area of Bulk Fossil Fuel Terminals varies by product and is difficult to define. Portland's 10 petroleum terminals generally serve Oregon and Southern Washington. This market area substantially exceeds the Portland metropolitan area, which is often colloquially referred to as the region. Some terminal representatives pointed out that the federal government's 5-state West Coast PADD 5 region is generally their regional market area.

Resolution 37168 lists a specific exception to not restrict service directly to end users. At a small scale, services to end users include retail gasoline filling stations, natural gas access lines in street right-of-way to residential and business customers, and heating oil tanks at home sites. Larger scale end users with fossil fuel storage and access infrastructure also include manufacturers, jet fuel facilities at the PDX Airport, vessel fuel facilities on Portland Harbor, and others, where fossil fuels are used as an input.

Industrial Use Categories

33.920.300 Bulk Fossil Fuel Terminal

A. Characteristics. Bulk Fossil Fuel Terminals are establishments primarily engaged in the transport and bulk storage of fossil fuels. Terminal activities may also include fuel blending, regional distribution, and wholesaling. The firms rely on access by marine, railroad or regional pipeline to transport fuels to or from the site, and either have transloading facilities for transferring a shipment between transport modes, or have storage capacity exceeding 5 million gallons (or equivalent volume) of fossil fuels. There is minimal on-site sales activity with the customer present.

B. Accessory uses. Accessory uses may include retail sales of petroleum products, offices, food membership distribution, parking, storage, truck fleet parking and maintenance areas, rail spur or lead lines, and docks.

C. Examples. Examples include crude oil terminals, petroleum products terminals, natural gas terminals, propane terminals, and coal terminals.

D. Exceptions.

1. Truck or marine freight terminals that do not store, transport or distribute fossil fuels are classified as Warehouse and Freight Movement uses.
2. Truck or marine freight terminals that do not have transloading facilities and have storage capacity of less than 5 million gallons are classified as Warehouse and Freight Movement uses.
3. Gasoline stations and other retail sales of fossil fuels are not Bulk Fossil Fuel Terminals.
4. Distributors and wholesalers that receive and deliver fossil fuels exclusively by truck are classified as Warehouse and Freight Movement uses.
5. Industrial, commercial, institutional, and agricultural firms that exclusively store fossil fuels for use as an input are not Bulk Fossil Fuel Terminals.
6. Uses that involve the transfer or storage of solid or liquid wastes are classified as Waste-Related uses.
7. The storage of fossil fuels for exclusive use at an airport, surface passenger terminal, marine, truck or air freight terminal, rail yard, or as part of a fleet vehicle servicing facility are accessory to their use.
8. Uses that recover or reprocess used petroleum products are not Bulk Fossil Fuel Terminals.

33.920.310~~300~~ Industrial Service

33.920.320~~310~~ Manufacturing And Production

33.920.330~~320~~ Railroad Yards

Commentary

33.920.340~~330~~ Warehouse And Freight Movement

A. Characteristics. Warehouse And Freight Movement firms are involved in the storage, or movement of goods for themselves or other firms. Goods are generally delivered to other firms or the final consumer, except for some will-call pickups. There is little on-site sales activity with the customer present.

B. Accessory uses. Accessory uses may include offices, food membership distribution, truck fleet parking and maintenance areas, rail spur or lead lines, docks, and repackaging of goods.

C. Examples. Examples include separate warehouses used by retail stores such as furniture and appliance stores; household moving and general freight storage; cold storage plants, including frozen food lockers; storage of weapons and ammunition; major wholesale distribution centers; truck, marine, or air freight terminals; bus barns and light rail barns; parcel services; major post offices; grain terminals; and the stockpiling of sand, gravel, or other aggregate materials.

D. Exceptions.

1. Uses that involve the transfer or storage of solid or liquid wastes are classified as Waste-Related uses.
2. Miniwarehouses are classified as Self-Service Storage uses.
3. Establishments that engage in the transfer or storage of fossil fuels, rely on access by marine, railroad or regional pipeline to transport fuels to or from the site, and either have transloading facilities or have storage capacity exceeding 5 million gallons of fossil fuels are classified as Bulk Fossil Fuel Terminal use.

33.920.350~~340~~ Waste-Related

33.920.360~~350~~ Wholesale Sales

A. Characteristics. Wholesale Sales firms are involved in the sale, lease, or rent of products primarily intended for industrial, institutional, or commercial businesses. The uses emphasize on-site sales or order taking and often include display areas. Businesses may or may not be open to the general public, but sales to the general public are limited as a result of the way in which the firm operates. Products may be picked up on site or delivered to the customer.

B. Accessory uses. Accessory uses may include offices, food membership distribution, product repair, warehouses, parking, minor fabrication services, and repackaging of goods.

C. Examples. Examples include sale or rental of machinery, equipment, heavy trucks, building materials, special trade tools, welding supplies, machine parts, electrical supplies, janitorial supplies, restaurant equipment, and store fixtures; mail order houses; and wholesalers of food, clothing, auto parts, building hardware, and office supplies.

Commentary

D. Exceptions.

1. Firms that engage primarily in sales to the general public are classified as Retail Sales And Service.

2. Firms that engage in sales on a membership basis are classified as either Retail Sales And Service or Wholesale Sales, based on a consideration of the characteristics of the use.

3. Firms that are primarily storing goods with little on-site business activity are classified as Warehouse And Freight Movement.

4. Establishments that engage in the regional wholesaling of fossil fuels, rely on access by marine, railroad or regional pipeline to transport fuels to or from the site, and either have transloading facilities or have storage capacity exceeding 5 million gallons of fossil fuels are classified as Bulk Fossil Fuel Terminal uses.

7. Other implementation recommendations

This section of the report recommends future implementation directions for building code amendments to address seismic resilience and periodic monitoring for code effectiveness.

Seismic resilience

Considering setting direction to implement this future action within the adopting ordinance:

- Portland Bureau of Emergency Management and Portland Office of Government Relations are directed to develop proposed State building code changes to improve seismic resilience and require seismic upgrades comparable to proposed requirements on unreinforced masonry buildings.

Seismic resilience is one of the underlying rationales for fossil fuel distribution policies and the proposed code amendments. Seismic safety requirements of land development are addressed in building codes, which are adopted and amended at the state level.

Monitoring for code effectiveness

Considering setting direction to implement this future action within the adopting ordinance:

- Portland Bureau of Planning and Sustainability is directed to periodically monitor the effectiveness of the proposed zoning code amendments to implement underlying policies and consider code adjustments in response to regional fuel demand and market changes, product innovation, safety and climate action considerations, and related regulatory changes.

A monitoring and adaptation approach would provide for ongoing code effectiveness within a context of changing energy markets, products, and associate regulations.

Appendix A: Stakeholder focus group results

Public involvement in the concept development for the Fossil Fuel Terminal Zoning Project consisted primarily of four stakeholder focus groups as well as meetings with fuel terminals and other individuals or organizations. The focus groups were held in June 2016. The purpose of the focus groups was to help identify and understand the issues that should help shape the preliminary zoning code being considered by this project. The focus groups also helped to expeditiously reach out to a broad range of stakeholders. While their perspectives and interests are shared on some topics, they diverge on other topics.

In addition to the stakeholder focus groups, BPS staff met with several fuel terminals to explain the proposal, answer questions, and discuss their individual concerns. This was needed because antitrust regulations constrained discussion about certain topics, for example supply chains, in the presence of representatives from other fuel terminals. Primarily, the terminal operators explained their operations and facilities, many of which differed substantially from other terminals.

Who participated?

Figure 9 lists the participants of the four focus groups conducted. Ten to twelve participants were invited to each meeting, although not everyone was able to attend. The first focus group consisted of fuel terminal representatives who have a direct stake in the proposed regulations. The second group was environmental and public health organizations, some of whom advocated for the resolution before City Council and have community safety and sustainability in mind. The third group were state and regional business and government organizations. Their interest was to protect the state economy by testing the proposal against economic realities. The fourth group was neighborhood and equity community organizations whose interests were to protect neighborhoods adjacent to the terminals and underserved communities who may rely on terminals for employment. Additionally, the Mayor's Office invited input from Native communities and tribal governments.

Preliminary code concepts discussed

- Identify "bulk fossil fuel terminals" as a regulated land use, characterized by inter-regional transport access and larger storage facilities.
- Either prohibit new terminals or set storage capacity limits high enough to accommodate regional growth.
- Allow existing terminals to expand for seismic upgrades, access to greener fuels and capacity for regional growth.

What discussion questions were asked?

The focus groups were provided background materials describing the preliminary code change concepts about two weeks before the focus group meetings. BPS staffed prompted the focus group across four topics:

Figure 9. Stakeholder Focus Group Participants, June 2016

STAKEHOLDER	DATE	ATTENDEES
Fuel terminal representatives	Thursday, June 02, 2016	Gilbert Betancourt, Phillips 66 Nick Giotta, Phillips 66 Stephanie Williams, Phillip 66 Andrew Holbrook, Kinder Morgan Shanna Brownstein, Northwest Natural Kevin Jones, McCall Oil Pamela Brady, BP West Coast Jerry Henderson, Chevron Kevin Buffum, Pacific Terminal Services Steve Kober, NuStar Will Rassmussen, WSPA Frank Holmes, WSPA Chris West, Pac/West and Arc Terminals Nathan Eggers, Arc Terminals Jerome Jackson, NuStar Rob Hill, NuStar Zach Klonoski, Mayor's Office
Environmental and health organizations	Tuesday, June 07, 2016	Regna Merritt, Ore. Physicians for Social Responsibility Trish Weber, Center for Sustainable Economy Meredith Connolly, Climate Solutions Kristen Sheeran, Climate Solutions Nick Caleb, 350PDX/CSE Bob Salinger, Audubon Society Dan Serren, Columbia Riverkeeper Adriana Voss-Andreae, 350PDX Micah Meskel, Portland Audobon
State and regional business organizations	Thursday, June 09, 2016	Jana Jarvis, Oregon Trucking Association Greg Theisen, Port of Portland Ellen Wax, Working Waterfront Jay Clemens, Associated Oregon Industries Mark Landauer, Oregon Public Ports Association Marion Haynes, Portland Business Alliance Corky Collier, Columbia Corridor Association Kelly Ross, NAIOP Shanna Brownstein, Northwest Natural Emerald Bogue, Port of Portland Susan Lahsene, Port of Portland Phil Grillo, Davis Wright Tremaine
Neighborhood and equity organizations	Tuesday, June 14, 2016	Jeff Geisler, Hayden Island Neighborhood Association John Bradley, Northwest District Association Travis Argue, UA Local 290 Willy Myers, Columbia Pacific Building Trades

1. Issues that should shape the project
2. Types of distribution and storage facilities to be regulated
3. Definition of fossil fuels
4. Zoning approach for limiting new storage facilities

In addition to specific questions within each topic, participants were invited to share any general and wrap-up comments during the focus group.

What we heard

For each topic area, the results of the focus groups are summarized in Figure 4 of Section 3. That table summarizes the main themes and concerns raised during the focus groups.

Key issues

Fuel terminal representatives objected to this policy direction in general. They discussed their safe operating history and commitment to implement the federal and state standards for renewable and clean fuels. There were challenges to participating in the conversation, but they agreed to work cooperatively on this project to get the code right. For example, anti-trust laws precluded the group from engaging in certain conversations because it would involve disclosing information about their supply chains and could be considered collusion in court of law. This group was concerned with the fast timeline and felt the policies should be discussed first.

They also felt the process was emotionally driven, not having considered the unintended consequences. For example, with renewable and clean fuel standards constantly in flux, they felt that zoning rules could make it more difficult to meet these standards. Restricting growth here in Portland at the end of the Olympic Pipeline could put more trucks on the road, instead of more efficient pipeline or rail transportation. The group asserted that there could also be significant economic impacts on the rest of the state, given that 95% of Oregon's fuel passes through Portland first. Lastly, fuel terminal representatives expressed concern for additional administrative burdens that a new land use category would bring. For example, what steps would be necessary for these firms to demonstrate that they were existing operations prior to the new zoning rules? Additionally, they warned that their site configuration may pose a challenge to effective zoning rules, as they are often non-contiguous operations connected by interconnected pipelines.

Environmental and public health organizations felt the policy direction was less aggressive toward fossil fuels than what the City Council resolution had proclaimed. They felt the resolution sought to outright prohibit new development and expansion on existing facilities. Because of this, they cautioned about community backlash if this proposal did not meet expectations. In this vein, they highlighted that Portland will be the first city to fully implement this type of policy, so the project could be an opportunity to set a strong precedent and model code for other cities. This group also felt that resident health and safety was also a top priority. They noted the seismic risks posed by fuel terminal tank farms that lie on liquefaction zones as well as the June 2016 oil train wreck in Mosier. For these reasons, they felt Portland Bureau of Emergency Management (PBEM) and other environmental justice groups should be involved in safety considerations. Lastly, the group felt the economic impact statement should include more than the impact on jobs. It should also consider the risks of economic and financial damages from a natural disaster. Members of this focus group offered to provide technical analysis on the impacts that the proposed options could have on the environment and public health and safety.

Some noted that risks should be accounted for through bonding or insurance requirements under worst-case scenarios.

State and regional business organizations felt that this undertaking requires more research. The resolution set required tasks, including an economic impact analysis and an examination of relevant laws, and they felt these tasks should be completed before laying the groundwork through code development. They felt the marine cargo forecast for liquid bulks of 1% growth is outdated and too low. (Note, an opposite reaction was expressed by environmental and health organization representatives who felt this figure was too high.) Similarly, they feared that the code may not hold up well in five years because of constantly changing energy markets. For example, in five years Portland could be shipping cleaner fuels to the Midwest. Some members expressed concern that the zoning code may not be the right tool to achieve some of the GHG (greenhouse gas) reduction and public safety goals that this resolution aimed to achieve. If the goal is public safety, then the City should require or create incentives for seismic upgrades. They stated that, if the goal is to reduce greenhouse gases, then prohibiting the export of cleaner-burning fuels, such as LNG (liquefied natural gas), may have the opposite intended effect. Lastly, the group asserted the important role that Portland's fuel terminal facilities play in rest of the state economy. They warned of political and economic repercussions that these decisions could have. They shared the view with fuel terminal representatives that this is a big political decision—the timeline is too short and the process should not be rushed.

Neighborhood and equity community organizations communicated that safety, pollution and accidental releases were their top priority when considering zoning for fuel terminals. They wanted a close examination of the seismic and explosion risks associated with fuel terminals. For example, which terminals are in liquefaction zones? Where are the storage tanks located in relation to neighborhoods? They sought honesty about the risks posed to the Linnton neighborhood specifically. Rail safety in the Columbia Gorge was also a key issue. The June 2016 incident in Mosier highlighted the risks. A potential solution they offered would be more pipelines, but they are difficult to get built. This group recognized the difficulty in managing competing values. They felt a reasonable expectation of growth is a smart idea. One participant described the proposal as aggressive, adding that by prohibiting LNG export terminals, global export destinations like China may end up burning dirtier fuels, such as coal. They felt this also meant Portland would forego export profits.

New land use category

Fuel terminal representatives were concerned for the clarity of the rules. They felt that the definition of "bulk terminal" is very important to be clear. If the definition was open to interpretation, then permit staff could be pressured. They warned that creating "bulk fuel terminal" as a specifically regulated use could lead to unpredictable results. This group was also concerned with the definition of "region." They were unsure if off-shore distribution was the issue, advocating for using the federally recognized West Coast region (PADD 5) as the definition of "regional market." PADD 5 includes Oregon, Washington, California, Nevada, Arizona, Alaska and Hawaii.

Environmental and public health organizations wanted to see the regulation go beyond new facilities and also look at limits on expansion at existing facilities. They felt the City Council resolution was clear and unambiguous about opposing expansion of fossil fuel infrastructure, which includes expansions at existing sites. They emphasized the importance for getting the right definition of "bulk terminal" and the associated size limit (or prohibition)—these must be correct in order to effectively implement the policy. Some members questioned whether seismic upgrades at existing facilities could be allowed but

expansions prohibited. This group also urged the inclusion of PBEM's work on hazards in liquefaction zones in this project.

State and regional business organizations echoed the concerns for clear and correct definitions that the fossil fuel representatives posed. "Region," "export," "end user," and "fossil fuel" are all important terms to get right. They also were strongly opposed to making existing facilities non-conforming uses, as well as making them limited uses with unclear exceptions. This would expose projects to discretionary land use actions, which is costly and unpredictable, and hence risky. It would likely make improvements that the community values, such as seismic upgrades, more difficult to attain.

Neighborhood and equity community organizations were skeptical that a new export terminal would be proposed in the Portland area in the wake of Pembina. They felt that Superfund sites were too expensive to acquire and build on. The group also wondered whether a new zone for fossil fuels ought to be created instead of a land use. They questioned why it ought to be allowed in IG2.

Definition of fossil fuels

Fuel terminal representatives were primarily concerned with the long-term applicability of the proposed rules. Energy markets and new technologies are constantly in flux, and it is difficult to know what the size requirements might be for newer—perhaps cleaner—fuels, particularly blended fuels. This group sought clarification for what "green fuels" meant. They noted that the proposed inclusion of LNG among city-regulated fossil fuels is inconsistent with the State of Oregon's inclusion of LNG as a "clean fuel." They called for periodic review of the rules when tomorrow's cleaner fuels become known, as they may not meet today's definitions. They cautioned about unintended consequences of placing restrictions on fossil fuel terminals, such as potentially putting more trucks on the road by restricting growth at facilities with pipeline, marine and rail access. This may result in considerably more GHG emissions. They also felt that methanol should not be included in the list of regulated fuels because it is used more as a value-added commodity than a fuel. They shared this last viewpoint with most other focus groups, except the environmental and health organizations.

Environmental and public health organizations looked to the intent of the City Council resolution and noted that it included propane, methanol, natural gas and other low-carbon fuels. At the same time, they agreed that code changes should provide flexibility to meet Oregon's low carbon fuel standard. They noted that methanol is currently being used as a fuel, so excluding it undermines the policy. The group sought clarification on how to address non-fuels. Some suggested that the GHG emissions of these input commodities should help ground their use. Others thought that the proportions (e.g., in blended fuels) should be considered—if the product is mostly used as a fossil fuel, then it should be regulated and restricted. Lastly, they highlighted how even one new LNG tank in Portland is a major safety issue. Although not explosive, coal also poses a significant risk, especially in transportation. Because of these risks, they believed that the resolution should be implemented through health and safety standards.

State and regional business organizations expressed frustration that while the federal and state government are going one direction requiring cleaner-burning fuels, the City of Portland appears to be choosing to restrict distribution of these cleaner fuels in another policy direction. Some members thought the City could try to incentivize a higher blend of renewables, and others warned of the disincentives that could discourage investment—disincentives should limit GHG emissions, not seismic upgrades.

Neighborhood and equity community organizations thought that restricting methanol exports would be an overreach. They said it is not being used as a fuel in the United States, and instead it is a value-added product used in manufacturing of plastics and other goods. Including methanol would negatively impact the manufacturing sector that requires it as an input, and it could open the door to regulating other non-fuel commodities, such as paints and asphalt. In general, they felt that if we can make certain fuels cleaner burning, then it poses minimal threat. They asserted that, since there is no clear transitional path away from our dependency on fossil fuels, we should make way for cleaner alternatives, such as blended bio-diesel.

Terminal development restrictions

Fuel terminal representatives were concerned with potential restrictions precluding development on certain site configurations, which have some peculiarities. For example, where two existing tank farms are non-contiguous (e.g., at Willbridge) and are connected by facility pipelines, they should be allowed an option for expansion. Additionally, some sites may already be built out and cannot accommodate the new growth that is expected. This group could not comment on facility size and anticipated growth, because of anti-trust laws, but they noted that it is critically important. For this reason, they could not provide feedback on the implementation options presented.

Environmental and public health organizations generally preferred Option A. However, some recognized the legal challenges posed by federal restrictions. They wondered if health and human safety risks may provide a defensible rationale. Some members also noted that while prohibiting all new facilities and making existing facilities non-conforming uses might be more legally defensible, it is much less politically feasible. Finally, some members of this group were skeptical of the 1% annual growth forecast for liquid bulks. They felt this was too high, which is contrary to what the state and regional business organization representatives stated.

State and regional business organizations criticized the approach to implementing the City Council resolution. They felt that zoning to regulate tank size approaches the problem sideways, and the unclear rationale could lead to appeals and legal challenges. One participant advocated to prohibit exports more directly, rather than a sideways approach. They cautioned that tank size limits could essentially put the region on an "import diet," even if the intent of the limit is to reduce throughput. They did not think this proposal accounted for these unintended impacts. Docked ships in the harbor may need an LNG tank to power their facilities and improve air quality, for example. They also noted that there are economic advantages and efficiency gains to being a bigger facility, and placing restrictions on size will have consequences that we don't want—lower wages for example. Lastly, they felt the 1% annual growth forecast for liquid bulks was outdated—an updated forecast would be higher. This was the opposite of what environmental and public health organizations stated.

Neighborhood and equity community organizations generally preferred Option C, calling it a realistic proposal that allows for some growth but doesn't restrict it too much. While the group was fairly resolute that coal is not a good alternative, they recognized that LNG is a cleaner-burning fuel. However, since the facilities in the region are already at capacity, Option C would allow for some wiggle room for the region's growth. They felt it would allow the "invisible hand" to guide the market more easily. They recommended that the City review the size limits every few years as the market changes.