



CITY OF
PORTLAND, OREGON
OFFICE OF CITY ATTORNEY

Linda Meng, City Attorney
1221 S.W. 4th Avenue, Suite 430
Portland, Oregon 97204
Telephone: (503) 823-4047
Fax No.: (503) 823-3089

May 19, 2010

Public Utility Commission
Attention: Filing Center
550 Capitol Street NE #215
PO Box 2148
Salem, OR 97308

Re: Docket No. LC 48: PGE 2009 Integrated Resource Plan

Dear Commission:

Enclosed for filing is an original and one copy of the City of Portland's Intervenor Comments in the above-referenced docket. A copy of this document was served on all parties listed on the attached Certificate of Service in this matter.

Very truly yours,

Benjamin Walters
Chief Deputy City Attorney

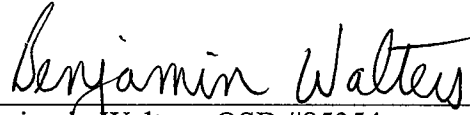
BW:lw
Enclosures
cc: Service List-LC 48



CERTIFICATE OF SERVICE

I hereby certify that I served the attached City of Portland Comments regarding Docket LC 48 to the following individuals of record in this matter on this 19th day of May, 2010.

Respectfully submitted,



Benjamin Walters, OSB #85354
Chief Deputy City Attorney
Attorneys for City of Portland

BRUCE A KASER

PO BOX 958
SILVERTON OR 97381-0958
brucekaser@comcast.net

***DEPARTMENT OF JUSTICE**

JANET L PREWITT (C)
ASSISTANT AG

NATURAL RESOURCES SECTION
1162 COURT ST NE
SALEM OR 97301-4096
janet.prewitt@doj.state.or.us

***OREGON DEPARTMENT OF ENERGY**

KIP PHEIL (C)
SENIOR POLICY ANALYST

625 MARION ST NE - STE 1
SALEM OR 97301-3737
kip.pheil@state.or.us

VIJAY A SATYAL (C)
SENIOR POLICY ANALYST

625 MARION ST NE
SALEM OR 97301
vijay.a.satyal@state.or.us

ASSOCIATED OREGON INDUSTRIES

JOHN LEDGER

1149 COURT ST NE
SALEM OR 97301
johnledger@aoi.org

BOMA PORTLAND

SUSAN STEWARD
EXECUTIVE DIRECTOR

200 SW MARKET, SUITE 1710
PORTLAND OR 97201
susan@bomaportland.org

CABLE HUSTON BENEDICT ET AL

J LAURENCE CABLE (C)

1001 SW 5TH AVE STE 2000
PORTLAND OR 97204-1136
lcable@cablehuston.com

**CABLE HUSTON BENEDICT
HAAGENSEN & LLOYD LLP**

RICHARD LORENZ (C)

1001 SW FIFTH AVE - STE 2000
PORTLAND OR 97204-1136
rlorenz@cablehuston.com

**CITIZENS' UTILITY BOARD OF
OREGON**

GORDON FEIGHNER (C)
ENERGY ANALYST

610 SW BROADWAY, SUITE 308
PORTLAND OR 97205
gordon@oregoncub.org

ROBERT JENKS (C)
EXECUTIVE DIRECTOR

610 SW BROADWAY STE 308
PORTLAND OR 97205
bob@oregoncub.org

G. CATRIONA MCCrackEN (C)
LEGAL COUNSEL/STAFF ATTY

610 SW BROADWAY - STE 308
PORTLAND OR 97205
catriona@oregoncub.org

**CITY OF PORTLAND - CITY
ATTORNEY'S OFFICE**

BENJAMIN WALTERS (C)
CHIEF DEPUTY CITY ATTORNEY

1221 SW 4TH AVE - RM 430
PORTLAND OR 97204
ben.walters@portlandoregon.gov

**CITY OF PORTLAND - PLANNING
& SUSTAINABILITY**

MICHAEL ARMSTRONG (C)
SUSTAINABILITY MANAGER

1900 SW 4TH AVE, STE 7100
PORTLAND OR 97201
michael.armstrong@portlandoregon.gov

DAVID TOOZE (C)
SENIOR ENERGY SPECIALIST

1900 SW 4TH STE 7100
PORTLAND OR 97201
david.tooze@portlandoregon.gov

**CLACKAMAS COUNTY BUSINESS
ALLIANCE**

BURTON WEAST
EXECUTIVE DIRECTOR

300 OSWEGO POINTE DR, STE 220
LAKE OSWEGO OR 97034
burton@ccba.biz

**COLUMBIA CORRIDOR
ASSOCIATION**

CORKY COLLIER

PO BOX 55651
PORTLAND OR 97238
corky@columbiacorridor.org

COLUMBIA RIVERKEEPER

LAUREN GOLDBERG (C)

724 OAK STREET
HOOD RIVER OR 97031
lauren@columbiariverkeeper.org

DAVIS WRIGHT TREMAINE LLP

JOHN DILORENZO 1300 SW FIFTH AVE, STE 2300
PORTLAND OR 97201
johndilorenzo@dwt.com

MARK P TRINCHERO 1300 SW FIFTH AVE STE 2300
PORTLAND OR 97201-5682
marktrinchero@dwt.com

DAVISON VAN CLEVE

IRION A SANGER (C) 333 SW TAYLOR - STE 400
ASSOCIATE ATTORNEY PORTLAND OR 97204
ias@dvclaw.com

DEPARTMENT OF JUSTICE

STEPHANIE S ANDRUS (C) REGULATED UTILITY & BUSINESS SECTION
ASSISTANT ATTORNEY 1162 COURT ST NE
GENERAL SALEM OR 97301-4096
stephanie.andrus@state.or.us

ECUMENICAL MINISTRIES OF OREGON

JAMES EDELSON 415 NE MIRIMAR PL
PORTLAND OR 97232
edelson8@comcast.net

ECUMENICAL MINISTRIES OF OREGON

JENNY HOLMES 0245 SW BANCROFT, SUITE B
ENVIRONMENTAL MINISTRIES PORTLAND OR 97239
DIRECTOR jholmes@emoregon.org

ESLER STEPHENS & BUCKLEY

JOHN W STEPHENS (C) 888 SW FIFTH AVE STE 700
PORTLAND OR 97204-2021
stephens@eslerstephens.com; mec@eslerstephens.com

FRIENDS OF COLUMBIA GORGE

MICHAEL LANG (C) 522 SW FIFTH AVENUE, SUITE 720
PORTLAND OR 97204
michael@gorgefriends.org

IBERDROLA RENEWABLES, INC

KEVIN LYNCH 1125 NW COUCH ST STE 700
PORTLAND OR 97209
kevin.lynch@iberdrolausa.com

TOAN-HAO NGUYEN 1125 NW COUCH ST
PORTLAND OR 97209
toan.nguyen@iberdrolausa.com

IBEW LOCAL 125

MARCY PUTMAN
POLITICAL AFFAIRS &
COMMUNICATION
REPRESENTATIVES

17200 NE SACRAMENTO STREET
PORTLAND OR 97230
marcy@ibew125.com

**INDUSTRIAL CUSTOMERS OF
NORTHWEST UTILITIES**

MICHAEL EARLY
EXECUTIVE DIRECTOR

1300 SW 5TH AVE, STE 1750
PORTLAND OR 97204-2446
mearly@icnu.org

**NORTHWEST ENERGY
COALITION**

STEVEN WEISS
SR POLICY ASSOCIATE

4422 OREGON TRAIL CT NE
SALEM OR 97305
steve@nwenergy.org

**NORTHWEST ENVIRONMENTAL
DEFENSE CENTER**

MARK RISKEDAHL

10015 SW TERWILLIGER BLVD
PORTLAND OR 97219
msr@nedc.org

**NORTHWEST FOOD PROCESSORS
ASSOCIATION**

DAVID ZEPPONI
PRESIDENT

8338 NE ALTERWOOD RD, STE 160
PORTLAND OR 97220
pbarrow@nwfpa.org

NORTHWEST PIPELINE GP

JANE HARRISON (C)
MGR-MARKETING SERVICES

295 CHIPETA WAY
SALT LAKE CITY UT 84158
jane.f.harrison@williams.com

BRUCE REEMSNYDER (C)
SENIOR COUNSEL

295 CHIPETA WAY
SALT LAKE CITY UT 84108
bruce.reemsnyder@williams.com

**NW INDEPENDENT POWER
PRODUCERS**

ROBERT D KAHN
EXECUTIVE DIRECTOR

1117 MINOR AVENUE, SUITE 300
SEATTLE WA 98101
rkahn@nippc.org

OREGON AFL-CIO

JOHN BISHOP

1635 NW JOHNSON ST
PORTLAND OR 97209
jbishop@mbjlaw.com

**OREGON CATTLEMEN'S
ASSOCIATION**

KAY TEISL

3415 COMMERCIAL ST SE, SUITE 217
SALEM OR 97302
kayteisl@orcattle.com

OREGON DEPARTMENT OF ENERGY

ANDREA F SIMMONS (C)

625 MARION ST NE
SALEM OR 97301-3737
andrea.f.simmons@state.or.us

OREGON ENVIRONMENTAL COUNCIL

JANA GASTELLUM
PROGRAM DIRECTOR, GLOBAL WARMING

222 NW DAVIS ST, STE 309
PORTLAND OR 97309-3900
janag@oeonline.org

OREGON FOREST INDUSTRIES COUNCIL

RAY WILKESON

PO BOX 12826
SALEM OR 97309
ray@ofic.com

OREGON SIERRA CLUB

IVAN MALUSKI

1821 SE ANKEY ST
PORTLAND OR 97214
ivan.maluski@sierraclub.org

PACIFIC ENVIRONMENTAL ADVOCACY CENTER

AUBREY BALDWIN (C)
STAFF ATTORNEY/CLINICAL PROFESSOR

10015 SW TERWILLIGER BLVD
PORTLAND OR 97219
abaldwin@lclark.edu

PACIFIC ENVIRONMENTAL ADVOCACY CENTER

ALLISON LAPLANTE (C)

10015 SW TERWILLIGER BLVD
PORTLAND OR 97219
laplante@lclark.edu

PACIFIC POWER & LIGHT

JORDAN A WHITE
SENIOR COUNSEL

1407 W. NORTH TEMPLE, STE 320
SALT LAKE CITY UT 84116
jordan.white@pacificcorp.com

PACIFICORP ENERGY

PETE WARNKEN
MANAGER, IRP

825 NE MULTNOMAH - STE 600
PORTLAND OR 97232
pete.warnken@pacificorp.com

PHYSICIANS FOR SOCIAL RESPONSIBILITY-OREGON CHAPTE

CATHERINE THOMASSON
CLIMATE CHANGE CHAIR
OREGON PSR

1227 NE 27TH #5
PORTLAND OR 97232
thomassonc@comcast.net

PNGC POWER

JOHN PRESCOTT
PRESIDENT AND CEO

711 NE HALSEY
PORTLAND OR 97232
jprescott@pngcpower.com

PORTLAND BUSINESS ALLIANCE

BERNIE BOTTOMLY

200 SW MARKET, STE 150
PORTLAND OR 97201
bbottomly@portlandalliance.com

PORTLAND GENERAL ELECTRIC

PATRICK G HAGER (C)
MANAGER - REGULATORY
AFFAIRS

121 SW SALMON ST 1WTC0702
PORTLAND OR 97204
pge.opuc.filings@pgn.com

DENISE SAUNDERS (C)
ASST GENERAL COUNSEL

121 SW SALMON ST - 1WTC1711
PORTLAND OR 97204
denise.saunders@pgn.com

PUBLIC UTILITY COMMISSION

MAURY GALBRAITH

PO BOX 2148
SALEM OR 97308
maury.galbraith@state.or.us

**RENEWABLE NORTHWEST
PROJECT**

KEN DRAGOON

917 SW OAK, SUITE 303
PORTLAND OR 97205
ken@rnp.org

RICHARDSON & O'LEARY

GREGORY MARSHALL
ADAMS (C)
ATTORNEY

PO BOX 7218
BOISE ID 83702
greg@richardsonandoleary.com

RICHARDSON & O'LEARY PLLC

PETER J RICHARDSON (C)

PO BOX 7218
BOISE ID 83707
peter@richardsonandoleary.com

SALEM CHAMBER OF COMMERCE

MIKE MCLARAN
CHIEF EXECUTIVE OFFICER

1110 COMMERCIAL ST SE
SALEM OR 97301
mike@salemchamber.org; jason@salemchamber.org

SEDCOR

RAYMOND BURSTEDT
PRESIDENT

625 HIGH ST NE, STE 200
SALEM OR 97301
rburstedt@sedcor.com

SIERRA CLUB LAW PROGRAM

GLORIA D SMITH (C)

85 SECOND STREET
SAN FRANCISCO CA 94105
gloria.smith@sierraclub.org

TURLOCK IRRIGATION DISTRICT

RANDY BAYSINGER
ASSISTANT GENERAL MANAGER

PO BOX 949
TURLOCK CA 95381-0949
rcbaysinger@tid.org

WESTSIDE ECONOMIC ALLIANCE

JONATHAN F SCHLUETER

10220 SW NIMBUS AVE, STE K-12
TIGARD OR 97223
jschlueter@westside-alliance.org



City of Portland Bureau of
Planning and Sustainability
Sam Adams, Mayor | Susan Anderson, Director

LC 48, Portland General Electric Integrated Resource Plan
City of Portland Comments
Susan Anderson, Director
Bureau of Planning and Sustainability

May 19, 2010

The City of Portland has a broad range of interests in Portland General Electric's Integrated Resource Plan. As one of PGE's 20 largest customers, Portland is a significant ratepayer. As home to businesses and residents comprising one-fourth of all PGE's load, Portland has a keen interest in protecting the interests of our businesses and residents. And as a local government, we are dedicated to pursuing public policies that advance the collective good in the long run. This long-term perspective is critical in an IRP process, as the long life of power plants makes today's decisions significant for decades to come.

Of critical importance in this regard is climate change. Impacts of climate change are already in evidence in Oregon and globally, and these effects are likely to accelerate. Scientists repeatedly underscore the grave urgency of reducing emissions of carbon dioxide and other greenhouse gas emissions,¹ and world leaders have responded so slowly to the emerging threats that little time remains to stabilize the climate. Oregon has been a leader in pioneering innovative solutions to complex environmental and economic challenges, and the mounting urgency of climate change deserves a serious and rapid response.

The City of Portland and State of Oregon both recognized the dangers of climate change nearly 20 years ago. The Oregon legislature first adopted a carbon reduction goal in 1989. In 1997, the legislature granted the Oregon Energy Facility Siting Council authority to set carbon dioxide emissions standards for new power plants, thereby enacting the first state or federal law in the U.S. explicitly designed to reduce carbon emissions. Ten years later, the legislature established a new goal to reduce emissions to 75 percent below 1990 levels by 2050. In 2005, Governor Kulongoski issued the Greenhouse Gas Emissions Reduction Strategy, which identifies actions for the state to reach this 75 percent emissions reduction target. In 2007, legislation established the Global Warming Commission to guide Oregon's work on climate change.

¹ See, for example, the testimony of climatologists at the May 6, 2010 hearing of the House Select Committee on Energy Independence and Global Warming. URL: http://globalwarming.house.gov/pubs?id=0018#main_content. Similarly, an open letter to *Science* magazine from 255 climate scientists, "Climate Change and the Integrity of Science," published May 7, 2010. URL: <http://www.sciencemag.org/cgi/content/full/328/5979/689>.

At the local level, the City of Portland first adopted a plan to reduce carbon emissions in 1993. In 2001, Multnomah County joined with Portland in establishing a carbon reduction goal and action plan. In 2009, Portland and Multnomah County jointly adopted a major revision, the Climate Action Plan, that sets a target of reducing greenhouse gas emissions 80 percent from 1990 levels by 2050 and details a set of actions to be taken by 2012 to begin to shift to that emissions trajectory.

Local efforts to date have had a measurable impact, helping reduce carbon emissions from energy use in Multnomah County to below 1990 levels, despite rapid population growth and, for the most part, a strong economy.²

PGE's proposed IRP begins to consider carbon emissions in its analysis, and it is to be commended for its proposal to cease coal operations at Boardman early. Portland strongly supports closing Boardman no later than 2020, and preferably earlier. The analysis conducted thus far is insufficient to conclude which year is optimal for closing the plant, but early closure is a significant step in the right direction and will prove to be to everyone's long-term benefit.

Early closure of Boardman alone, however, is insufficient to meet expected federal regulations and falls far short of reaching the carbon reductions goals that both Portland and the State of Oregon share. In fact, only one action plan portfolio — #11, Oregon CO₂ compliance — comes close to tracking Oregon's 75 percent carbon reduction target. The 16 other resource portfolios do little to reduce carbon below PGE's 2005 emission level.

PGE's analysis suggests that carbon dioxide emissions vary widely among the scenarios—by 60 percent—while price impacts are tightly clustered, varying only four percent among the different scenarios. Keeping prices low and stable is a key decision criterion, but we cannot lose an opportunity to reduce carbon emissions so dramatically with comparatively small impact on energy bills.

This opportunity is still more important in the context of managing risk. Carbon is very likely to be regulated in the near future, either administratively or with new legislation, and PGE must protect its customers against that risk. By avoiding a high carbon portfolio, PGE protects ratepayers from potentially costly "climate stranded investments," a strategy that simultaneously addresses cost, regulatory risk and environmental risk. In addition, since the modifications that PGE proposes for Boardman for 2014 and 2017 to meet air quality requirements may become climate stranded investments shortly after their installation, it is especially important that these investments be scrutinized to ensure that they are a prudent use of ratepayer funds over their anticipated useful lives.

The attached expert testimony from Michael Burnett details Portland's concerns about the analysis provided to date and offers several recommendations for addressing limitations in PGE's analysis.

We urge the Commission to consider the full range of carbon impacts and risks—environmental and regulatory. Avoiding "climate stranded investments" is critical to the competitiveness of PGE's customers and must be a major criterion in the PUC's consideration of PGE's IRP.

² *Climate Action Plan 2009*. City of Portland and Multnomah County. URL: <http://www.portlandonline.com/bps/index.cfm?c=49989&a=268612>.

Expert Testimony of Mike Burnett on the Greenhouse Gas Aspects of PGE's IRP

Purpose of Document: This testimony was prepared by Mike Burnett, President, Hot Sky Consulting, on behalf of the City of Portland (the City), as input to the City's comments on the integrated resource plan (IRP) prepared by Portland General Electric (PGE). An overview of Mr. Burnett's qualifications is attached.

This testimony assesses the greenhouse gas aspects of PGE's IRP. It is presented in two sections, as well as an executive summary:

Section 1: Assessment of the Impacts of Boardman Shutdown on Achieving Various CO₂ Targets. This assesses the portfolios in the PGE IRP from a greenhouse gas perspective.

Section 2: Assessment of Compliance with PUC Guideline 8 on Treatment of CO₂ Risk. This assesses the methodological approach used in the PGE IRP to consider CO₂ risk.

This testimony is based on review of publicly available information presented by PGE to the Oregon PUC in the LC 48 proceeding, especially the document entitled "PGE Integrated Resource Plan 2009," as well as other publicly available documents.

EXECUTIVE SUMMARY

The executive summary provides synopses of methodological recommendations from Section 2, key findings regarding the impacts of Boardman shutdown on achieving various CO₂ targets, and key findings regarding compliance with PUC Guideline 8 on treatment of CO₂ risk.

Methodological Recommendations: The assessment of compliance with PUC Guideline 8 in Section 2 leads to the following recommendations:

- The IRP analysis should be restructured to treat CO₂ emissions as a constraint rather than a cost. Portfolios should be developed that are subject to declining emissions caps over time.
- For the purposes of the IRP, it is reasonable to use Waxman-Markey as a placeholder for final legislation, as it has passed one of the houses of Congress. The IRP should conduct two analyses:

- PGE Portfolio Only: Construct portfolios that comply with the declining emissions caps without the use of offsets, and
- PGE Portfolio With Offsets: Construct portfolios that comply with these reduction rates on a pro-rata basis with the use of offsets.

Section 1 Key Findings: The key findings of Section 1: Assessment of the Impacts of Boardman Shutdown on Achieving Various CO₂ Targets, are:

- Most of the portfolios investigated by the IRP provide PGE's customers with limited protection against carbon risk.
- While costs for the portfolios investigated by the IRP are tightly clustered, CO₂ emissions vary widely.
- Boardman shutdown alone is insufficient to meet likely cap and trade requirements for 2020.
- Avoiding "climate stranded investments" – both for resource additions and for any clean air investments in Boardman – is critical to the competitiveness of PGE's customers.

Section 2 Key Findings: The key findings of Section 2, Assessment of Compliance with PUC Guideline 8 on Treatment of CO₂ Risk, are:

- The IRP identifies cap and trade in 2013 as likely regulation.
- The IRP models a carbon tax rather than cap and trade.
- The IRP portfolios are not subject to declining emissions cap over time.
- The IRP does not develop differing compliance scenarios.

SECTION 1: ASSESSMENT OF THE IMPACTS OF BOARDMAN SHUTDOWN ON ACHIEVING VARIOUS CO₂ TARGETS

Overview of Key Findings, Section 1

- Most of the portfolios investigated by the IRP provide PGE's customers with limited protection against carbon risk. The portfolios in PGE's IRP, while including considerable and unprecedented investment in low carbon energy resources, do not reduce CO₂ levels sufficiently to enable PGE to achieve compliance with likely cap and trade requirements. For example, while Waxman-Markey would require *17% reductions* by 2020, the IRP's preferred portfolio yields 2020 emissions that are nearly *20% greater* than PGE's emissions in 2005. Maximum use of offsets would not enable this portfolio to comply.
- While costs for the portfolios investigated by the IRP are tightly clustered, CO₂ emissions vary widely. For all viable portfolios, costs varied from slightly below to 14% above PGE's preferred portfolio, while CO₂ emissions ranged from 65% below to 60% above PGE's 2005 emissions. The costs of majority of the portfolios are tightly clustered within 1% of the IRP's preferred portfolio. Among this cluster, 2020 emissions range from +3% to -21% compared to PGE's preferred portfolio. CO₂ emissions should be given a much higher weight when choosing amongst portfolios
- Boardman shutdown alone is insufficient to meet likely cap and trade requirements for 2020. While PGE's January 14 proposal to "either cease operation in 2020 or discontinue to use of pulverized coal as a fuel source" for Boardman is a significant step in the right direction, PGE would need to take additional actions to comply with anticipated cap and trade requirements. The three Boardman shutdown portfolios – year 2011, 2014, and year 2017 – while all reducing emissions from PGE's preferred portfolio, all yield 2020 emissions that are *greater than PGE's emissions in 2005*.
- Avoiding "climate stranded investments." Both for resource additions and for any clean air investments in Boardman, avoiding "climate standard investments" – is critical to the competitiveness of PGE's customers. Power plant infrastructure is long lived. Since the resources that PGE builds between now and 2020 are likely to be in operation in 2050 – when 80% reductions would be required – planning ahead to avoid premature shutdowns and "climate stranded investments" is critical to the competitiveness of PGE's customers. In addition, since the modifications that PGE proposes for Boardman for 2014 and 2017 to meet air quality requirements will essentially become climate stranded investments immediately upon their installation, it is especially important that these investments be scrutinized to ensure that they are a prudent use of ratepayer funds over their anticipated useful lives.

Detailed Assessment, Section 1

1. The importance of PGE's emissions to the City of Portland and Multnomah County.

Portland and Multnomah County adopted a joint Climate Action Plan in October, 2009. It includes greenhouse gas reduction targets of 40% below 1990 by 2030 and 80% below 1990 by 2050. Since 2008 emissions were essentially at 1990 levels in 2008 (1% below 1990), these effectively represent reductions that must occur from today's levels. And these reductions must be achieved in the face of population growth that is anticipated to increase population by 40% by 2030 and 90% by 2050. Per capital emissions reductions of 57% by 2030 and 89% must be achieved to meet these targets.

Electricity represents 32% of all greenhouse gas emissions statewide (2004). PGE is by far the largest provider of electricity in Portland, with a 67% market share. PGE constitutes 2.5 million metric tons out of Multnomah County's 8.5 million ton carbon footprint, or 30%. Meeting the 2030 and 2050 targets will clearly require a much less carbon-intensive power supply than currently exists.

Just as PGE is significant to Portland and Multnomah County's carbon footprint, these locales represent a sizable portion of PGE's total sales. In 2008, PGE's sales in the City of Portland were 4.8 million MWh, while PGE's total sales were 20.0 million Mwh. Portland thus constitutes approximately one-fourth of PGE's sales.

In summary, PGE constitutes one-third of Portland-Multnomah County's emissions, and Portland-Multnomah Country represents one-fourth of PGE's sales.

2. It is prudent to plan on federal cap and trade becoming effective within several years.

It is inevitable that federal or state greenhouse gas regulation will be put into place within several years. Portland General Electric's (PGE) Integrated Resource Plan (IRP) agrees:

"We believe ... that it is reasonable to assume that a federal cap and trade program for greenhouse gases will be in place and effective in 2013." (Page 99)

"We believe that it is prudent to take reasonable steps to reduce greenhouse gas emissions and mitigate potential emissions impacts..." (Page 92)

On December 7, 2009, EPA issued an endangerment finding for greenhouse gases, stating that greenhouse gases “threaten the public health and welfare.” This sets the stage for an administrative (non-Congressional) path for controlling greenhouse gases that would be based upon inflexible Clean Air Act command-and-control regulations. The Administration, EPA, business, and environmental groups all consider this to a less desirable approach than cap and trade. The endangerment finding may prod Congress into action, and if Congress does not act, EPA will likely proceed administratively.

3. Most of the portfolios investigated by the IRP provide PGE’s customers with limited protection against carbon risk.

The portfolios in PGE’s IRP, while including considerable and unprecedented investment in low carbon energy resources, do not appear to reduce CO₂ levels sufficiently to enable PGE to achieve its share of federal, state, and local CO₂ targets, as embodied by recently passed or proposed legislation:

- The Action Plan scenario, Diversified Thermal with Green (#9) – which includes Boardman through 2050, yields 2020 emissions that are nearly 20% greater than PGE’s emissions in 2005.
- The three Boardman shutdown portfolios – year 2011, year 2014, and year 2017 – while all reducing emissions from PGE’s preferred portfolio, all yield 2020 emissions that are greater than PGE’s emissions in 2005.
- This is in contrast to the following CO₂ targets:
 - Federal: Waxman-Markey 17% below 2005 by 2020.
 - State: Oregon ~28% below 2005 by 2020. (10% below 1990)
 - Local: Portland 40% below 1990 by 2030. (~40% below 2005)

4. While costs for the portfolios investigated by the IRP are tightly clustered, CO₂ emissions vary widely.

The IRP portfolios exhibit tightly clustered costs, but their CO₂ emissions vary widely. Given this, and the high risk from both economic and climate change perspectives, CO₂ emissions should be given a much higher weight when choosing amongst portfolios. The following summarizes the cost and CO₂ emissions dispersion of the portfolios:

- Ten of the fourteen viable portfolios in the IRP have costs within 1% of the IRP’s preferred portfolio. Among this group of ten tightly cost-clustered portfolios, one shows a 3% increase in emissions compared to PGE’s preferred portfolio, while the other eight all show emissions decreases ranging as much as 21%.

- While PGE's 2005 emissions were approximately 8 million tons, the highest-carbon portfolio emits 12.8 million tons, and the lowest-carbon portfolio emits 2.8 million tons. Compared to 2005, the highest-carbon portfolio shows an emissions increase of 60%, while the lowest-carbon portfolio shows a decrease of emissions of 65%. Carbon intensity is much more dispersed than the costs of each portfolio.
- Apart from these extremes, CO₂ emissions for the portfolios range from 7.5 to 9.9 million tons, which is from 6% below to 23% above PGE's 2005 emissions. There is a cluster around 7.5 - 8.2 million tons (from -6% to +3% compared to PGE 2005 emissions), and another cluster around 9.1 - 9.8 million tons (from +14% to +23% compared to PGE 2005 emissions).

5. **Boardman shutdown alone is insufficient to meet likely cap and trade requirements for 2020.**

In the IRP preferred portfolio (Diversified Thermal with Green #9), Boardman continued to operate through 2040. This was embodied in their action plan. On January 14, PGE sent a letter to the PUC commissioners indicating a significant shift in its plans for Boardman. The letters proposes to "either cease operation in 2020 or discontinue the use of pulverized coal as a fuel source." PGE is to be lauded for taking such a step.

However, ceasing coal operations at Boardman alone is insufficient to enable PGE to meet its share of the various targets that have been established by governments at different levels, as shown above. (While such targets are either not binding on PGE or have yet to be enacted by legislation, it is reasonable to anticipate that regulation will be put into place at these approximate levels.)

If Boardman is removed from the resource mix, the carbon intensity of its effective replacement is critical. The only portfolio that meets the near term Waxman-Markey, Oregon, and Portland (2030) targets is Oregon CO₂ Compliance (#11). In this portfolio, not only is Boardman shut down, but PGE's interest in its other coal power plant (Colstrip) would be terminated as well, and a baseload combined cycle gas plant is not added. In addition, this portfolio adds an additional 511 average megawatts (MWA) of renewable energy and 623 MWA of nuclear beyond that of the preferred portfolio. Clearly, PGE should investigate other low-carbon portfolios that allow it to meet anticipated cap and trade requirements. These portfolios could include significantly larger amounts of zero carbon resources contained in the resource mix in smaller quantities, such as biomass, geothermal, solar photovoltaic, and wave energy, and other technologies not considered by the IRP, such as central station solar thermal with diurnal storage for baseload energy.

6. Avoiding “climate stranded investments” is critical to the competitiveness of PGE’s customers.

The resources that PGE builds between now and 2020 – both for resource additions and for any clean air investments in Boardman – are likely to be in operation at mid-century. This is when the 2050 targets become effective. These targets are much more stringent than the 2020 targets, requiring approximately 80% reductions from current levels. It would be quite possible to develop a portfolio that meets the 2020 targets, but that requires early shutdowns in order to meet the 2050 targets. Avoiding these “climate stranded investments” is critical to the competitiveness of PGE’s customers.

In addition, in the near term, the modifications that PGE proposes for Boardman for 2014 and 2017 to meet air quality requirements will essentially become climate stranded investments immediately upon their installation. Since their useful life is so short, it is especially important that these investments be scrutinized to ensure that they are a prudent use of ratepayer funds over their anticipated useful lives. Perversely, making these investments might make it financially more attractive to PGE to push to continue to operate the plant beyond 2020.

7. Carbon offsets can be used to meet only a part of PGE’s CO2 reduction needs.

Finally, carbon offsets in part can be used to comply with a cap and trade. However, policy makers are likely to enact some maximum amount of offsets that a covered entity can use. Examples of limits include Waxman-Markey, which uses a formula that would allow 28% of an entity’s 2020 compliance to come from offsets, and the Western Climate Initiative, which requires that less than half of the reductions from the base year be delivered by offsets. PGE’s preferred Diversified Thermal with Green portfolio, even with maximum offsets, would not enable it to meet its share of the respective targets for 2020.

8. Explanation of Attached Graph.

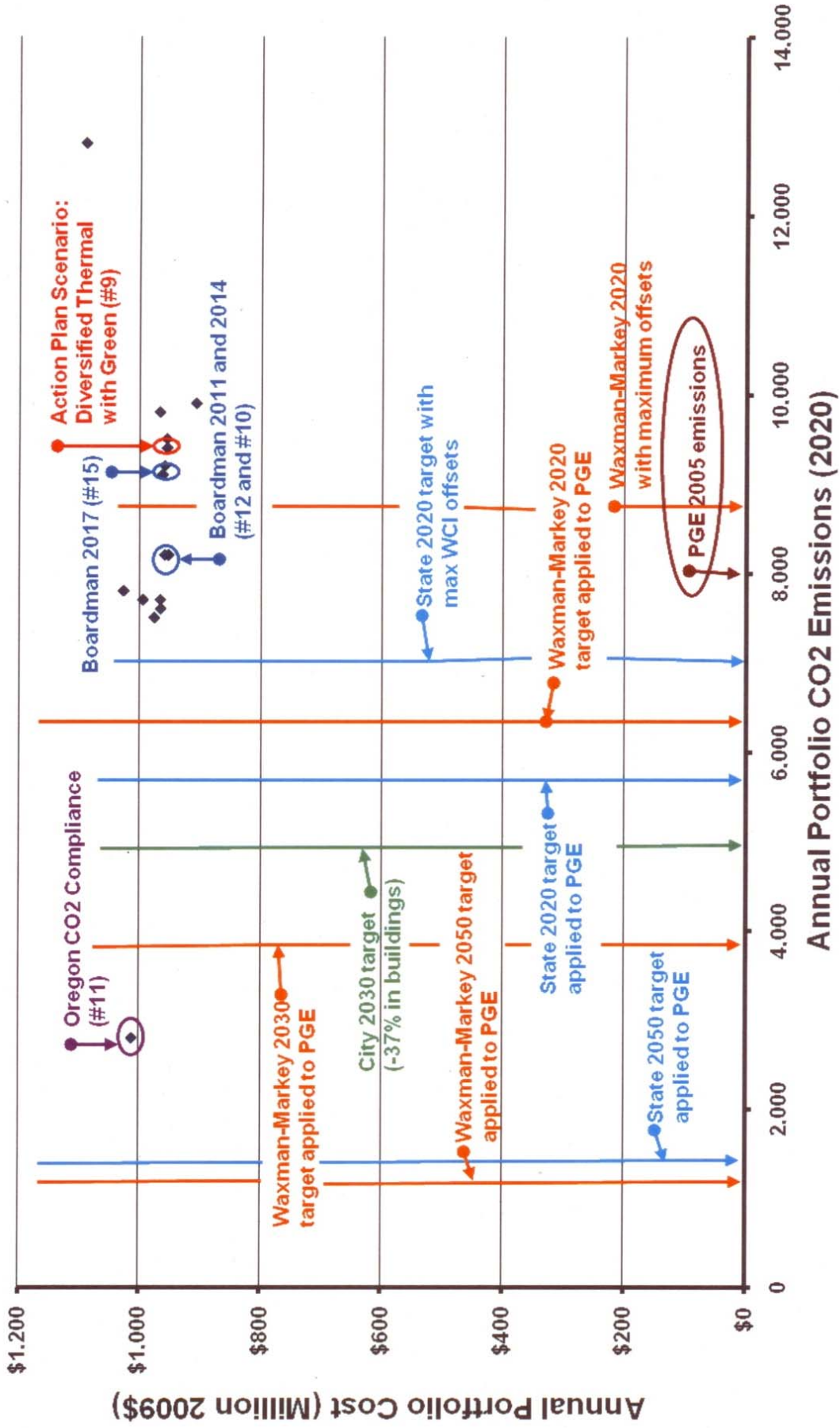
The attached graph presents information on the CO₂ intensity of the portfolios in PGE’s IRP, and puts it in context of CO₂ targets established by various governmental bodies.

- It shows the annual portfolio CO₂ emissions for 2020 on the horizontal axis, and the annual portfolio cost on the vertical axis.
- Each of the portfolios appears as a black diamond. Certain portfolios are highlighted with circles and labels:
 - The Action Plan Scenario, Diversified Thermal with Green (#9) is shown in red.
 - The Boardman shutdown portfolio (2011, 2014, and 2017; #12, #10, and #15, respectively) are shown in blue.
 - The Oregon CO₂ Compliance portfolio is shown in purple.

- Key figures related to PGE's CO₂ emissions are shown towards the bottom of the graph.
 - PGE's 2005 emissions are shown in brown, and are circled. These are approximated at 8 million short tons, which is the figure used to calculate reduction requirements of various policy regimes.

- Targets of governmental bodies are shown with colored vertical lines.
 - The US House-passed Waxman-Markey bill targets are shown in orange.
 - 2020, 2030, and 2050 targets are shown.
 - The maximum allowable offsets for 2020 are shown.
 - Oregon's CO₂ targets are shown in light blue.
 - The state 2020 and 2050 targets are shown.
 - The 2020 target with maximum WCI offsets is also shown.
 - Portland's CO₂ target for 2030 is shown in green. (This is derived from the 37% reduction assumed to come from buildings).

Range of CO2 Emissions and Costs Across Portfolios



SECTION 2: ASSESSMENT OF COMPLIANCE WITH PUC GUIDELINE 8 ON TREATMENT OF CO₂ RISK

Purpose: The Oregon PUC adopted Guideline 8 on June 30, 2008. It provides guidance to utilities on how to address CO₂ risk in the integrated resource planning (IRP) process. This document assesses the extent to which the IRP produced by Portland General Electric (PGE) dated November 5, 2009, complies with Guideline 8.

Recommendations, Section 2

This assessment leads to the following recommendations:

- The IRP analysis should be restructured to treat CO₂ emissions as a constraint rather than a cost. Portfolios should be developed that are subject to declining emissions caps over time.
- For the purposes of the IRP, it is reasonable to use Waxman-Markey as a placeholder for final legislation, as it passed one of the houses of Congress. The IRP should conduct two analyses:
 - PGE Portfolio Only: Construct portfolios that comply with the declining emissions caps without the use of offsets, and
 - PGE Portfolio With Offsets: Construct portfolios that comply with these reduction rates on a pro-rata basis with the use of offsets.
- The IRP should develop alternative compliance scenarios with stringencies and timing for cap and trade implementation that differ from those of the reference case. Sensitivity analysis should evaluate the cost/risk performance of portfolios that comply with the reference case assumptions under these differing alternative compliance scenarios.

Overview of Key Findings, Section 2

This assessment of PGE's IRP regarding its compliance with Guideline 8 on treatment of CO₂ risk makes the following findings:

- **The IRP identifies cap and trade in 2013 as likely regulation.** The IRP complies with the requirement to identify the likely form of CO₂ compliance requirements by stating that it is prudent to plan for a cap and trade regime being in place in 2013. PGE, along with the majority of climate policy experts, anticipates that cap and trade rather than a carbon tax will be the regulatory approach in the United States.
- **The IRP models a carbon tax rather than cap and trade.** The IRP's analytic approach is not consistent with cap and trade regulatory approach, but rather models CO₂

regulation as if it were a carbon tax. Various CO₂ cost adders are used in economic dispatch models, and the resulting emissions are calculated. No constraint is put on emissions, and as a result, the majority of the portfolios, including the preferred portfolio, fail to comply with anticipated cap and trade requirements, as represented by Waxman-Markey. This is a very serious inconsistency.

- **The IRP portfolios are not subject to declining emissions cap over time.** Under Waxman-Markey and other cap and trade proposals under consideration, firm emissions caps are established that decline annually over time. The general range of reductions is 20% by 2020 and more than 80% by 2050. However, in the IRP, the emissions of the portfolios are not bound by these increasingly stringent constraints. Rather, the time profile of CO₂ compliance requirements is only addressed by increasing CO₂ costs over time (to reflect these increasing requirements), and determining the emissions resulting from the dispatch response to these cost increases. This is a very serious issue.
- **The IRP does not develop differing compliance scenarios.** The IRP does not develop differing compliance scenarios that reflect differing stringencies and timing for cap and trade implementation, but rather assesses differing levels of CO₂ cost. Rather than conducting sensitivity analysis of the robustness of different portfolios across a range of different compliance stringencies, it conducts sensitivity analysis of the amount of emissions resulting from economic dispatch with differing CO₂ costs.

Background and Assessment, Section 2

Overview of Guideline 8: Guideline 8 requires that utilities conduct four sets of analyses to address CO₂ risk when undertaking integrated resource planning:

- a. Base Case and Other Compliance Scenarios
- b. Testing Alternative Portfolios Against the Compliance Scenarios
- c. Trigger Point Analysis
- d. Oregon Compliance Portfolio

The requirements of each are summarized below, along with an assessment of the degree to which PGE's IRP complies with the guidance.

a. Base Case and Other Compliance Scenarios

This guideline places the following requirements on the utility. An assessment of the degree to which PGE's IRP complies with the requirement appears below each requirement. The order in

which the requirements are discussed has been modified to enhance the clarity of the assessment.

- **Identify the likely form of compliance requirements: CO₂ tax, ban on certain types of resources, or CO₂ caps (with or without allowance or credit trading or a safety valve).**

Assessment: The IRP identifies a federal cap and trade program effective in 2013 as the form of compliance (page 99), and summarizes the Waxman-Markey (passed by the House) and Kerry-Boxer (under consideration in the Senate) bills. It notes that the requirements of both of these bills are similar: Waxman-Markey requires 17% reductions from 2005 levels by 2020 and 83% reductions by 2050 while Kerry-Boxer requires 20% reductions by 2020, 42% reductions by 2030, and 83% reductions by 2050. It also notes 1) that a utility could comply in part with offsets, but that there are many qualitative and quantitative restrictions, and 2) that the bill includes no safety valve but rather a strategic reserve that it characterizes limited and likely ineffective.

- **Construct a base-case scenario that reflects what it considers to be the most likely regulatory compliance future.**

Assessment: The IRP includes a \$30 per ton cost adder for CO₂ in its reference case. This cost is added to the operating cost of resources in an economic dispatch model. The CO₂ emissions of operating this set of resources at their resulting capacity factors is calculated. The \$30 per ton is a reasonable estimate and based upon credible analyses of Waxman-Markey and other Congressional proposals.

However, the approach that the IRP uses does not result in portfolios that comply with the CO₂ reduction requirements of Waxman-Markey. It treats CO₂ regulation as a cost increase only, not as a binding emissions limit. While the IRP chooses – in agreement with most experts – cap and trade as the regulatory structure, it models the regulation as if it were a carbon tax.

The resulting portfolios assessed by the IRP do not comply with the emissions limits in Waxman-Markey, as shown in the attached document. Only one of the 15 portfolios analyzed complies with the 17% reduction requirement. Even with the maximum use of offsets, the preferred portfolio and Boardman 2017 would not comply, along with five other portfolios. Thus half of the fourteen viable portfolios would not comply with the most liberal interpretation of Waxman-Markey for 2020.

The analysis should be restructured to treat CO₂ emissions as a constraint rather than a cost. Portfolios should be developed and analyzed that meet the CO₂ constraints as they decline over time.

In summary, the analytic approach used by the IRP does not reflect what PGE considers to be the most likely regulatory compliance future, and as a result, the IRP portfolios show limited reduction in emissions. The analysis should be redone to seek the lowest cost/risk portfolio that meets the declining emissions caps.

- **Develop several compliance scenarios ranging from the present CO₂ regulatory level to the upper reaches of credible proposals by governing entities.**

Assessment: The IRP assesses the impacts of a range of CO₂ cost scenarios on economic dispatch and resulting CO₂ emissions. The range of costs is reasonable. However, the IRP again does not reflect what PGE considers to be the most likely regulatory compliance future. The range of CO₂ costs analyzed does not constitute “compliance scenarios,” because they are not compliant with cap and trade reduction requirements and they do not reflect differing regulatory compliance regimes, but rather the market costs of CO₂ under differing compliance regimes. The analysis should be conducted to comply with the caps inherent in cap and trade. The range of CO₂ costs should be applied to purchases of offsets.

- **Include a time profile of CO₂ compliance requirements.**

Assessment: The IRP does provide a time profile for CO₂ costs. However, this is not the same as a time profile for CO₂ compliance requirements. Raising the CO₂ cost does not result in portfolios that comply with the reduction requirements. General consensus among governing entities is that reductions on the order of 20% by 2020 and over 80% by 2050 are necessary. These reductions follow an approximately linear path.

For the purposes of the IRP, it is reasonable to use Waxman-Markey as a placeholder for final legislation, as it passed one of the houses of Congress. An appropriate time profile would be the quantity of emissions allowances issues under Section 721 of Waxman-Markey. The caps show a decline each year from 2012 (2013 in PGE’s IRP) to 2050. The IRP should conduct two analyses:

- PGE Portfolio Only: Construct portfolios that comply with these reduction rates on a pro-rata basis without the use of offsets, and
- PGE Portfolio With Offsets: Construct portfolios that comply with these reduction rates on a pro-rata basis with the use of offsets.
- **Recognize upstream emissions.**

Assessment: The IRP includes CO₂ emissions from power that PGE purchases under contract or on the market, so it does recognize upstream emissions.

- **Maintain logical consistency with other key inputs, if practicable.**

Assessment: The IRP maintains reasonable logical consistency by reflecting anticipated changes in other key inputs consistent with the various CO₂ regulatory scenarios.

b. Testing Alternative Portfolios Against the Compliance Scenarios

This guideline places the following requirements on the utility. An assessment of the degree to which PGE's IRP complies with the requirement appears below each requirement.

- **Estimate, under each of the compliance scenarios, the revenue requirements and risk measure for a set of reasonable portfolios from which the preferred portfolio is selected.**

Assessment: Given the IRP's basic approach of treating cap and trade as a carbon tax without binding emission reduction requirements, the differing CO₂ costs thus act as the "compliance scenarios" (although they are not really compliant). However, they do not represent differing emissions reduction compliance requirements, but rather place no limitation on emissions. Instead, the costs of CO₂ are varied in an attempt to see how economic dispatch effects emissions. This analysis should not define "compliance scenarios" as differing CO₂ costs, but rather differing levels of stringency of caps.

- **Incorporate end effects considerations.**

Assessment: The IRP addresses end effects when calculating present value.

- **Conduct sensitivity analysis on a range of reasonably possible regulatory futures.**

Assessment: Again, the IRP investigates how differing CO₂ costs would affect economic dispatch and resulting emissions, while not requiring that the emissions comply with anticipated cap levels. This approach does not comply with the sensitivity analysis requirements. The sensitivity analysis should be conducted with a goal of determining the least cost/risk portfolio that meets varying levels of cap stringency. This would provide information on the robustness of portfolio selection across a range of potential caps.

c. Trigger Point Analysis

This guideline places the following requirements on the utility. An assessment of the degree to which PGE's IRP complies with the requirement appears below each requirement.

- **Identify at least one CO₂ compliance "turning point" scenario that would require a substantially different portfolio.**

Assessment: The IRP reports that it modeled a range of CO₂ costs, and sought a price at which one of the alternative portfolios that was “substantially different” would displace the preferred scenario as least-cost. Once they determined which CO₂ cost scenario resulted in a “substantially different” portfolio, they reduced the CO₂ cost incrementally until the cost advantage of the alternative portfolio over the preferred portfolio disappeared. The alternative portfolio is #8, Diversified Green with On-Peak Energy Target. It adds the bundle of renewable energy resources from #4 Diversified Green and maintains the bundle of generating resources of the preferred portfolio, #9.

Whether this constitutes a “substantially different” portfolio is debatable. It does increase renewables, which allows fossil to be used less intensively, reducing emissions.

Whether it constitutes a compliant portfolio is also debatable. The emissions of this alternative portfolio, while nearly 20% lower than those of the preferred portfolio (for only a 1% cost increase!), do not comply with the 2020 reduction requirements of Waxman-Markey, unless maximum offsets are allowed.

Since the IRP did not constrain CO₂ emissions to comply with a cap, the trigger point analysis does not comply with the guidelines.

- **Compare the portfolio appropriate to this scenario and compare it to the expected cost and risk performance to those of the preferred portfolio across the range of CO₂ compliance scenarios.**

Assessment: The IRP did perform such a comparison using its uncapped, carbon tax modeling approach. However, it does not comply with the intent of this requirement. The intent of this requirement is to test the lower carbon alternative portfolio and the preferred portfolio against a range of caps, not against a range of carbon taxes.

- **Assess the likelihood of whether a CO₂ regulatory future that is equally or more stringent that the trigger point would be mandated.**

Assessment: The IRP makes no assessment of the relative likelihood of a future with \$42+ CO₂ prices. Rather, it treats all of the CO₂ costs (\$0, \$12, \$20, \$30, \$45, and \$65) as equally likely. Again, the trigger point analysis is not intended to investigate responses to varying degrees of carbon tax, but rather to varying stringencies of the cap.

d. Oregon Compliance Portfolio

This guideline places the following requirements on the utility. An assessment of the degree to which PGE’s IRP complies with the requirement appears below each requirement.

- If none of the above is consistent with Oregon energy policies and GHG reduction goals, construct the best cost/risk portfolio that achieves such consistency and compare it to the preferred and alternative portfolios.

Assessment: None of the portfolios, other than the Oregon Compliance Portfolio, comply with Oregon’s GHG reduction goals. Therefore, preparing this portfolio was necessary.

QUALIFICATIONS OF MR. BURNETT

Mr. Burnett has over three decades of experience as a “serial pioneer” in emerging sustainability arenas. He has fifteen years as a successful start-up CEO, and has a history of highly creative technical, policy, program design, and project development work in the formative stages of renewable energy, energy efficiency, and climate change mitigation. His expertise relevant to this work includes integrated resource planning, quantifying carbon dioxide emissions, and climate policy.

EMPLOYMENT

<u>The Climate Trust</u>	Executive Director	1999 – Present
<ul style="list-style-type: none"> • Start-up CEO for nation's first carbon offset enterprise • Assembled 19 project, \$11 million offset portfolio acclaimed for quality, diversity, & innovation • Developed highly regarded voluntary carbon offset programs for business and consumers • Established organization as a key participant in national and international debate on offsets • Attracted outstanding staff into non-profit environment; recruited top notch Board members • Financial excellence: outstanding audits, strong budgeting, and revenue growth/diversification • Appointed by Oregon Governor Ted Kulongoski Member to Advisory Group on Global Warming, Carbon Allocation Task Force, and Climate Change Integration Group • Member of Steering Committee for the Voluntary Carbon Standard 		
<u>Trexler and Associates</u>	Vice President	1998-1999
<ul style="list-style-type: none"> • Facilitated corporate strategies for utility, petroleum, and manufacturing clients • Developed early action crediting proposal for national sustainable industry CEO group • Prepared feasibility study on major international carbon offset project • Participant in development of Greenhouse Gas Protocol 		
<u>Conservation and Renewable Energy System</u>	Managing Director	1999- 2000
<ul style="list-style-type: none"> • Managed the start-up of a Joint Operating Agency of eight Washington PUDs • Negotiated \$65 million in conservation and wind on a fast track • Turned \$300,000 in start-up investment tin \$21 million in net financial benefits • Conducted largest municipal bond sale to fund energy conservation (\$38 million) 		
Public Power Council	Senior Engineer	1987-1992
Pacific Northwest Utilities Conference Committee	Senior Conservation Planner	1983-1986

Bonneville Power Administration
Western Solar Utilization Network
National Park Service

Load Research Manager 1982-1983
Energy Systems Analyst 1980-1982
Energy Program Coordinator 1978-1980

EDUCATION

University of Florida

MS, Environmental Engineering 1978

- Concentration: Energy Analysis and Systems Ecology
- National Science Foundation Graduate Fellow

Hiram College

BA, Biology 1975