

<b>Costs</b>	
<b>. . . of Capping Carbon</b>	<b>. . . Of Climate Disruption<sup>1</sup></b>
<p><b><u>DEQ 2017 Analysis of “Market Approach” (E3)<sup>2</sup></u></b></p> <ul style="list-style-type: none"> <li>• 16 modeling scenarios for OR C&amp;T</li> <li>• GDP effect -0.08% to +0.19% (vs. historical OR GDP swings from -1.5% to +10.9%)<sup>3</sup></li> <li>• Jobs impact from -0.07% (-1543 jobs) to +0.32% (+6578 jobs)</li> </ul> <p><b><u>PSU Study 2013<sup>4</sup></u></b>  <u>When revenues returned to economy:</u> (per 2013 PSU analysis of \$60/ton carbon tax / Scenario C)</p> <ul style="list-style-type: none"> <li>• Positive job growth (+7000 jobs)</li> <li>• Positive labor income growth</li> <li>• Slight reduction in output (- 0.3%)</li> <li>• Distributional issues (but scenario includes revenue set-asides for low income and at-risk industry; and effects further mitigated if neighbors – CA, WA, BC – adopt comparable GHG regulation.)</li> </ul>	<p><b><u>In Oregon</u></b></p> <ul style="list-style-type: none"> <li>• 2018 Wildfire: \$100 million (ODF/USFS 40/60 split) for firefighting; plus community economic losses (e.g., \$5 million wheat farmers’ loss to Stateline fire)</li> <li>• 2017 Wildfire: \$51 million in lost tourism revenues (e.g. Ashland Shakespeare and Sisters Folk Festival smoke-caused cancellations)</li> <li>• Growing risks to OR: <ul style="list-style-type: none"> <li>• agriculture (\$4.8 B)</li> <li>• ocean fisheries (\$200 MM)</li> <li>• tourism (\$11.8 B/150,000 jobs)</li> <li>• public health</li> <li>• infrastructure (2800 road miles in 100-yr flood plain; rebuild costs \$250K to \$500MM/mile)</li> </ul> </li> </ul>
<p><b><u>CA/WCI Carbon Cap (AB 32); Regional GHG Initiative (RGGI)<sup>5</sup></u></b></p> <ul style="list-style-type: none"> <li>• CA allowances auctioned 2012-2018</li> <li>• CA auction prices: \$10/T to \$15.31/T</li> <li>• CA gets more “clean energy venture capital” than all other states combined (per CARB<sup>6</sup>)</li> <li>• CA and RGGI state economies growing faster than national average<sup>7</sup></li> <li>• RGGI electricity rates down 1% (nat’l average down 2%); but \$220 MM customer bill <i>reduction</i> beats national averages (2015-17)</li> </ul>	<p><b><u>Nationally/Globally</u></b></p> <ul style="list-style-type: none"> <li>• 2017 Extreme Weather/Fire: \$160B loss (MunichRe)</li> <li>• 2018 Paradise CA / “Camp Fire”: \$16B loss &amp; 86 lives (200 miles from CA/OR border)</li> <li>• 2018 Natl Climate Assessment<sup>8</sup> estimates climate-driven losses of 1% to 10% loss in US GDP by 2100 . . . identifies agriculture, manufacturing, supply chains, trade at risk . . . \$ billions to relocate infrastructure</li> </ul>
<p><b><u>Utilities and Industry</u></b></p> <ul style="list-style-type: none"> <li>• Wind (-67%), solar (-86%) costs down since 2000; lower than new gas, coal generation<sup>9</sup></li> <li>• New electric vehicles available at ± \$35K<sup>10</sup>; with lower life cycle (fuel + service) costs</li> <li>• New carbon-efficient process options for cement<sup>11</sup>, aluminum production<sup>12</sup></li> <li>• World Bank estimates that effective climate fixes (e.g., clean energy) would add \$1.8T to \$2.6T to global GDP<sup>13</sup></li> </ul>	<p><b><u>Utilities and Industry</u></b></p> <ul style="list-style-type: none"> <li>• PG&amp;E (North CA) facing bankruptcy from utility-assisted wildfire<sup>14</sup>; delivering rolling blackouts to customers<sup>15</sup></li> <li>• Other utilities enter bankruptcy citing extreme weather: Entergy<sup>16</sup> (New Orleans- 2005), ExGenTexas Power<sup>17</sup> (Houston- 2017)</li> <li>• Fed Reserve/Richmond finds climate change depresses overall US GDP growth rate, with negative impacts to housing, services, finance, insurance<sup>18</sup></li> </ul>

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<sup>1</sup> Unless otherwise footnoted, cost figures are given and sourced in OGWC 2018 Biennial Report to the Legislature.

<sup>2</sup> <https://www.oregon.gov/deq/FilterDocs/ghgmarketstudy.pdf>

<sup>3</sup> Based on 2018 GDP of \$227B: = -\$181mm to + \$431mm; OR GDP historical swings from -\$3.4B to +\$24.7B

<sup>4</sup> <https://www.pdx.edu/nerc/sites/www.pdx.edu/nerc/files/carbontax2014.pdf>

<sup>5</sup> <https://www.analysisgroup.com/news-and-events/news/latest-study-from-analysis-group-confirms-that-rggi-program-continues-to-boost-the-economy-and-create-jobs/>

<sup>6</sup> [http://next10.org/2018-gii?\\_ga=2.93074845.1037812924.1548723282-649143805.1548723282](http://next10.org/2018-gii?_ga=2.93074845.1037812924.1548723282-649143805.1548723282)

<sup>7</sup> "... in the ten years since California passed its first climate law (AB 32), emissions fell by 11 percent, even as its economy grew by almost 16 percent during one of the longest economic expansions in the state's history. In comparison, the U.S. economy grew by 11.6 percent while emissions decreased by 10.6 percent." [http://next10.org/2018-gii?\\_ga=2.93074845.1037812924.1548723282-649143805.1548723282](http://next10.org/2018-gii?_ga=2.93074845.1037812924.1548723282-649143805.1548723282)

<sup>8</sup> Fourth National Climate Assessment, 2018; <https://www.energysage.com/electric-vehicles/costs-and-benefits-evs/electric-car-cost/>

<sup>9</sup> Lazard Freres Consulting 2018; <https://www.lazard.com/perspective/levelized-cost-of-energy-and-levelized-cost-of-storage-2018/>

<sup>10</sup> Base price of Chevrolet Bolt: \$30K; Nissan Leaf: \$22.5K; Tesla Model 3: \$35K – EnergySage, at <https://www.energysage.com/electric-vehicles/costs-and-benefits-evs/electric-car-cost/>

<sup>11</sup> New York Times December 2, 2018

<sup>12</sup> Rio Tinto/Alcoa press release 10 May, 2018

<sup>13</sup> Climate Smart Development", World Bank Group and Climate Works Foundation, 2014, page 21

<sup>14</sup> <https://www.seattletimes.com/business/california-regulators-make-preparations-for-pge-bankruptcy/>

<sup>15</sup> <https://www.sfgate.com/california-wildfires/article/PG-E-warns-it-may-shut-off-power-amid-red-flag-13306256.php>

<sup>16</sup> <https://www.elp.com/articles/2015/08/ten-years-after-how-entergy-new-orleans-survived-hurricane-katrina.html>

<sup>17</sup> <https://www.shipkevich.com/exgen-texas-power-files-bankruptcy/>

<sup>18</sup> "The Impact of Higher Temperatures on Economic Growth", Federal Reserve Richmond, August 2018; [https://www.richmondfed.org/-/media/richmondfedorg/publications/research/economic\\_brief/2018/pdf/eb\\_18-08.pdf](https://www.richmondfed.org/-/media/richmondfedorg/publications/research/economic_brief/2018/pdf/eb_18-08.pdf)