# Net-Zero America - national state report v2

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### Reading guide

IN DRAFT

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Table 1: *E- scenario - PILLAR 1: Efficiency/Electrification - Residential*

| variable_name | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|
| Residential HVAC investment in 2020s vs. REF - Cumulative 5-yr | 0 | 244.234 | 252.226 | 0 | 0 | 0 | 0 |
| Sale of space heating units by type - Electric Heat Pump | 0.13 | 0.313 | 0.322 | 0.336 | 0.351 | 0.367 | 0.384 |
| Sale of space heating units by type - Electric Resistance | 0.208 | 0.207 | 0.205 | 0.201 | 0.196 | 0.185 | 0.166 |
| Sale of space heating units by type - Fossil | 0.101 | 0.119 | 0.087 | 0.067 | 0.063 | 0.062 | 0.063 |
| Sale of space heating units by type - Gas | 0.562 | 0.361 | 0.386 | 0.396 | 0.39 | 0.385 | 0.386 |
| Sales of cooking units - Electric Resistance | 0.609 | 0.609 | 0.609 | 0.609 | 0.609 | 0.609 | 0.609 |
| Sales of cooking units - Gas | 0.391 | 0.391 | 0.391 | 0.391 | 0.391 | 0.391 | 0.391 |
| Sales of water heating units by type - Electric Heat Pump | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sales of water heating units by type - Electric Resistance | 0.384 | 0.519 | 0.52 | 0.523 | 0.522 | 0.523 | 0.523 |
| Sales of water heating units by type - Gas Furnace | 0.58 | 0.454 | 0.454 | 0.451 | 0.452 | 0.451 | 0.451 |
| Sales of water heating units by type - Other | 0.036 | 0.027 | 0.026 | 0.026 | 0.026 | 0.026 | 0.026 |

Table 2: *E- scenario - PILLAR 1: Efficiency/Electrification - Transportation*

| variable_name | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|
| End-use technology sales by technology - HDV - diesel | 0.981 | 0.982 | 0.979 | 0.97 | 0.956 | 0.935 | 0.916 |
| End-use technology sales by technology - HDV - EV | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| End-use technology sales by technology - HDV - gasoline | 0.002 | 0.002 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 |
| End-use technology sales by technology - HDV - hybrid | 0.001 | 0.001 | 0.001 | 0.001 | 0.002 | 0.002 | 0.002 |
| End-use technology sales by technology - HDV - hydrogen FC | 0.001 | 0.001 | 0.002 | 0.002 | 0.002 | 0.002 | 0.003 |
| End-use technology sales by technology - HDV - other | 0.015 | 0.013 | 0.016 | 0.024 | 0.037 | 0.057 | 0.076 |
| End-use technology sales by technology - LDV - diesel | 0.014 | 0.018 | 0.022 | 0.02 | 0.018 | 0.017 | 0.016 |
| End-use technology sales by technology - LDV - EV | 0.041 | 0.062 | 0.071 | 0.087 | 0.106 | 0.121 | 0.133 |
| End-use technology sales by technology - LDV - gasoline | 0.894 | 0.857 | 0.834 | 0.813 | 0.792 | 0.773 | 0.757 |
| End-use technology sales by technology - LDV - hybrid | 0.049 | 0.057 | 0.07 | 0.076 | 0.081 | 0.086 | 0.089 |
| End-use technology sales by technology - LDV - hydrogen FC | 0.001 | 0.004 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 |
| End-use technology sales by technology - LDV - other | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 |
| End-use technology sales by technology - MDV - diesel | 0.652 | 0.635 | 0.616 | 0.596 | 0.58 | 0.565 | 0.552 |
| End-use technology sales by technology - MDV - EV | 0 | 0.001 | 0.003 | 0.007 | 0.009 | 0.01 | 0.01 |
| End-use technology sales by technology - MDV - gasoline | 0.34 | 0.355 | 0.37 | 0.385 | 0.397 | 0.408 | 0.417 |
| End-use technology sales by technology - MDV - hybrid | 0.004 | 0.004 | 0.005 | 0.006 | 0.007 | 0.008 | 0.009 |
| End-use technology sales by technology - MDV - hydrogen FC | 0.002 | 0.002 | 0.002 | 0.003 | 0.003 | 0.004 | 0.005 |
| End-use technology sales by technology - MDV - other | 0.003 | 0.003 | 0.003 | 0.003 | 0.004 | 0.005 | 0.007 |

Table 3: *E- scenario - PILLAR 2: Clean Electricity - Generating capacity*

| variable_name | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|
| Power generation capital investment - biomass power plant | 0 | 0 | 0.002 | 0.002 | 0.002 | 0.002 | 0.014 |
| Power generation capital investment - biomass w/ccu allam power plant | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Power generation capital investment - biomass w/ccu power plant | 0 | 0 | 0.187 | 0.051 | 0.04 | 0.043 | 0.037 |

Table 4: *E- scenario - PILLAR 2: Clean Electricity - Generation*

| variable_name | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|
| Power generation by technology - biomass power plant | 3585.2 | 4154.2 | 1170.7 | 1247.6 | 846.708 | 681.371 | 301.132 |
| Power generation by technology - biomass w/ccu allam power plant | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Power generation by technology - biomass w/ccu power plant | 0 | 0 | 88.114 | 98.968 | 107.951 | 120.025 | 129.506 |

Table 5: *E- scenario - PILLAR 3: Bioenergy and Hydrogen - Bioconversion*

| variable_name | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|
| Biomass converted - BECCS-H2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Biomass converted - Biopower | 7103.6 | 16068.1 | 14149.5 | 12722.6 | 6553.7 | 8191 | 11636.8 |
| Biomass converted - Biopower w/ cc | 0 | 0 | 53.225 | 59.781 | 65.207 | 72.499 | 78.225 |
| Biomass converted - ethanol | 129536.4 | 129536.4 | 129529.2 | 129529.4 | 129536.3 | 129536.3 | 129536.2 |
| Biomass converted - FT diesel | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Biomass converted - FT diesel w/ cc | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Biomass converted - pyrolysis liquids | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Biomass converted - pyrolysis liquids w/ cc | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Biomass converted - SNG | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Biomass converted - SNG w/ cc | 0 | 0 | 5.896 | 6.224 | 5.521 | 5.325 | 5.341 |

Table 6: *E- scenario - IMPACTS - Jobs*

| variable_name | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|
| Jobs by economic sector - agriculture | 30509.2 | 31901.3 | 31367.7 | 31313.3 | 30472 | 30467 | 30777.8 |
| Jobs by economic sector - construction | 500429.4 | 442886.6 | 446175.4 | 501228.4 | 540788.4 | 564182.6 | 654706 |
| Jobs by economic sector - manufacturing | 386730.5 | 331815.3 | 365578.5 | 421784.8 | 429120.3 | 380807 | 428603.3 |
| Jobs by economic sector - mining | 562819.1 | 481485.3 | 400602.8 | 333553.2 | 269133.4 | 224097.2 | 177285.3 |
| Jobs by economic sector - other | 44238.3 | 34545.9 | 35103.8 | 44813.4 | 53531.2 | 60256.6 | 95104.5 |
| Jobs by economic sector - pipeline | 45541.9 | 46536.7 | 48395.3 | 49114.5 | 46833.6 | 47105.9 | 45678.4 |
| Jobs by economic sector - professional | 291931.7 | 271995.9 | 263679.6 | 280140.8 | 302074.3 | 314668.3 | 358271.7 |
| Jobs by economic sector - trade | 308460.6 | 277149.3 | 253538 | 251171.1 | 253853 | 255558.8 | 283422.6 |
| Jobs by economic sector - utilities | 418449 | 424257.7 | 422267.5 | 473463.8 | 510552 | 530968 | 547051.6 |
| Jobs by resource sector - Biomass | 81346.7 | 82434.1 | 79427.4 | 76547.4 | 73316.8 | 72403.5 | 71509.2 |
| Jobs by resource sector - CO2 | 0 | 0 | 1.028 | 1.307 | 1.407 | 1.554 | 1.656 |
| Jobs by resource sector - Coal | 154575.8 | 117263.6 | 72101.6 | 50758.2 | 42743.4 | 38285.7 | 33441 |
| Jobs by resource sector - Grid | 435977.5 | 432506.4 | 454754.6 | 560966 | 628521.7 | 665165.9 | 735460.5 |
| Jobs by resource sector - Natural Gas | 562810.1 | 570260.3 | 562626.1 | 562153.9 | 548271.4 | 541238.1 | 504129.1 |
| Jobs by resource sector - Nuclear | 50508.8 | 50224 | 48457.2 | 46083.2 | 36862.4 | 36017.8 | 25302.4 |

Table 6: *E- scenario - IMPACTS - Jobs (continued)*

| variable_name | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|
| Jobs by resource sector - Oil | 840220.8 | 795393.5 | 714447.8 | 648289.1 | 589677.2 | 544284.5 | 474549.9 |
| Jobs by resource sector - Solar | 343026.5 | 203737.3 | 195249.6 | 261816.7 | 274748.3 | 286921.2 | 523815 |
| Jobs by resource sector - Wind | 120643.4 | 90754.9 | 139643.2 | 179967.4 | 242215.6 | 223793.2 | 252692.4 |
| Median wages - Biomass | 50669.4 | 51794.4 | 52681.1 | 53506 | 54475 | 55716.9 | 56906.9 |
| Median wages - CO2 | 0 | 0 | 72624.1 | 74330.9 | 76115 | 77979.9 | 79929.1 |
| Median wages - Coal | 57981.2 | 59049.8 | 59933.1 | 60616.4 | 61536.7 | 62817.7 | 64175.8 |
| Median wages - Grid | 61740.9 | 62539.4 | 63374.7 | 64247.5 | 65158.9 | 66110 | 67101.8 |
| Median wages - Natural Gas | 65533.4 | 66255.8 | 67136.9 | 67917.7 | 68605.1 | 69423.5 | 70326.5 |
| Median wages - Nuclear | 69863.4 | 71485.6 | 73188 | 74973.6 | 76845.7 | 78807.8 | 80863.5 |
| Median wages - Oil | 64937.9 | 65821.7 | 66660.3 | 67464.9 | 68208.7 | 68927.1 | 69545.4 |
| Median wages - Solar | 55324.9 | 56156.7 | 56905 | 57622.4 | 58716.8 | 59822.6 | 60806.3 |
| Median wages - Wind | 58848.2 | 61363.5 | 60320.2 | 60450.6 | 61739.3 | 64571.7 | 65750.9 |
| Required Level of Education - Associates degree or some college | 260449.1 | 218575.2 | 161996.8 | 133135.5 | 120424.5 | 114513.8 | 107864.2 |
| Required Level of Education - Bachelors degree | 189494.3 | 162477.9 | 124641.8 | 104138 | 94868.5 | 91035.1 | 86087.7 |
| Required Level of Education - Doctoral degree | 7190.819 | 6532.818 | 5260.1 | 4502.89 | 4146.116 | 4061.548 | 3901.897 |
| Required Level of Education - High school diploma or less | 521613.2 | 452739 | 361430.9 | 316604.8 | 292913.7 | 281042.7 | 269982.2 |
| Required Level of Education - Masters or professional degree | 46290 | 40900.1 | 32213.9 | 27388.4 | 25205.1 | 24506.1 | 23473.7 |
| Wage income - Biomass | 4121786042 | 4269622423 | 4184319756 | 4095739814 | 3993930920 | 4034097715 | 4069366805 |
| Wage income - CO2 | 0 | 0 | 74627.6 | 97170.6 | 107075.5 | 121212.2 | 132365.9 |
| Wage income - Coal | 8962490259 | 6924393233 | 4321278929 | 3076783881 | 2630286427 | 2405017375 | 2146105567 |
| Wage income - Grid | 26917626724 | 27048704781 | 28819925024 | 36040670554 | 40953800096 | 43974102457 | 49350709898 |
| Wage income - Natural Gas | 36882883317 | 37783076987 | 37772989676 | 38180197393 | 37614218027 | 37574628950 | 35453635348 |
| Wage income - Nuclear | 3528718527 | 3590290290 | 3546482773 | 3455022910 | 2832716645 | 2838484780 | 2046040811 |
| Wage income - Oil | 54562194066 | 52354118490 | 47625317901 | 43736770600 | 40221136360 | 37515932939 | 33002754004 |
| Wage income - Solar | 18977891366 | 11441206551 | 11110679907 | 15086512836 | 16132346385 | 17164366893 | 31851246649 |
| Wage income - Wind | 7099640609 | 5569041183 | 8423299437 | 10879136026 | 14954225919 | 14450714406 | 16614761735 |

Table 7: *E- scenario - PILLAR 6: Land carbon sinks - Agriculture*

| variable_name | 2020 | 2030 | 2050 |
|---|---|---|---|
| Carbon sink enhancement potential - Accelerate regeneration | 0 | 0 | 85600 |
| Carbon sink enhancement potential - All (not counting overlap) | 0 | 0 | 2556100 |
| Carbon sink enhancement potential - Avoid deforestation | 0 | 0 | 133000 |
| Carbon sink enhancement potential - Extend rotation length | 0 | 0 | 511000 |
| Carbon sink enhancement potential - Improve plantations | 0 | 0 | 99500 |
| Carbon sink enhancement potential - Increase retention of HWP | 0 | 0 | 5e+05 |
| Carbon sink enhancement potential - Increase trees outside forests | 0 | 0 | 100500 |
| Carbon sink enhancement potential - Reforest cropland | 0 | 0 | 423500 |
| Carbon sink enhancement potential - Reforest pasture | 0 | 0 | 406000 |
| Carbon sink enhancement potential - Restore productivity | 0 | 0 | 297000 |
| Land impacted for carbon sink enhancement - Accelerate regeneration | 0 | 0 | 34500 |
| Land impacted for carbon sink enhancement - All (not counting overlap) | 0 | 0 | 505500 |
| Land impacted for carbon sink enhancement - Avoid deforestation | 0 | 0 | 35702 |
| Land impacted for carbon sink enhancement - Extend rotation length | 0 | 0 | 281500 |
| Land impacted for carbon sink enhancement - Improve plantations | 0 | 0 | 55300 |
| Land impacted for carbon sink enhancement - Increase retention of HWP | 0 | 0 | 1e+05 |
| Land impacted for carbon sink enhancement - Increase trees outside forests | 0 | 0 | 28350 |
| Land impacted for carbon sink enhancement - Natural uptake | -575.23 | -367.368 | -325.416 |
| Land impacted for carbon sink enhancement - Reforest cropland | 0 | 0 | 141000 |
| Land impacted for carbon sink enhancement - Reforest pasture | 0 | 0 | 30700 |
| Land impacted for carbon sink enhancement - Restore productivity | 0 | 0 | 167600 |
| Land impacted for carbon sink enhancement - Retained in Hardwood Products | -81.625 | -139.46 | -146.394 |
| Land impacted for carbon sink enhancement - Total | -656.855 | -506.828 | -471.81 |
| Land impacted for carbon sink enhancement - Total impacted (over 30 years) | 0 | 0 | 369152 |

Table 8: *E- scenario - PILLAR 6: Land carbon sinks - Forests*

| variable_name | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|
| Business-as-usual carbon sink - Accelerate regeneration | 0 | 0 | 0 | 0 | 0 | 0 | 8000 |
| Business-as-usual carbon sink - Avoid deforestation | 0 | 0 | 0 | 0 | 0 | 0 | 11373 |
| Business-as-usual carbon sink - Extend rotation length | 0 | 0 | 0 | 0 | 0 | 0 | 154000 |
| Business-as-usual carbon sink - Improve plantations | 0 | 0 | 0 | 0 | 0 | 0 | 21000 |
| Business-as-usual carbon sink - Increase retention of HWP | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Business-as-usual carbon sink - Increase trees outside forests | 0 | 0 | 0 | 0 | 0 | 0 | 5700 |
| Business-as-usual carbon sink - Reforest cropland | 0 | 0 | 0 | 0 | 0 | 0 | 16000 |
| Business-as-usual carbon sink - Reforest pasture | 0 | 0 | 0 | 0 | 0 | 0 | 7500 |
| Business-as-usual carbon sink - Restore productivity | 0 | 0 | 0 | 0 | 0 | 0 | 59000 |
| Business-as-usual carbon sink - Total impacted (over 30 years) | 0 | 0 | 0 | 0 | 0 | 0 | 16000 |
| Carbon sink enhancement potential | -0.7 | -0.73 | -0.75 | -0.78 | -0.8 | -0.83 | -0.85 |

Table 9: *E- scenario - IMPACTS - Fossil fuel industries*

| variable_name | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|
| Natural gas consumption | 23307383 | 23809227 | 26243227 | 27450264 | 25559593 | 25988309 | 25610198 |
| Oil consumption | 6208419 | 6043121 | 5699351 | 5490884 | 5512123 | 5642283 | 5819966 |

Table 10: *E- scenario - PILLAR 1: Efficiency/Electrification - Overview*

| variable_name | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|
| Final energy demand by sector - commercial | 9.013 | 9.089 | 9.161 | 9.159 | 9.215 | 9.479 | 9.955 |
| Final energy demand by sector - industry | 25.111 | 26.559 | 27.315 | 27.857 | 28.763 | 29.709 | 30.835 |
| Final energy demand by sector - residential | 11.787 | 11.149 | 10.849 | 10.682 | 10.653 | 10.714 | 10.787 |
| Final energy demand by sector - transportation | 28.007 | 26.732 | 24.918 | 23.878 | 24.004 | 24.746 | 25.679 |

Table 11: *E- scenario - PILLAR 1: Efficiency/Electrification - Commercial*

| variable_name | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|
| Commercial HVAC investment in 2020s - Cumulative 5-yr | 0 | 1033244493197 | 1071458377902 | 0 | 0 | 0 | 0 |
| Sales of cooking units - Electric Resistance | 0.325 | 0.347 | 0.348 | 0.348 | 0.348 | 0.349 | 0.349 |
| Sales of cooking units - Gas | 0.675 | 0.653 | 0.652 | 0.652 | 0.652 | 0.651 | 0.651 |
| Sales of space heating units - Electric Heat Pump | 0.03 | 0.202 | 0.53 | 0.69 | 0.712 | 0.715 | 0.714 |
| Sales of space heating units - Electric Resistance | 0.079 | 0.096 | 0.153 | 0.22 | 0.269 | 0.277 | 0.277 |
| Sales of space heating units - Fossil | 0.039 | 0.036 | 0.027 | 0.011 | 0.002 | 0 | 0 |
| Sales of space heating units - Gas Furnace | 0.852 | 0.666 | 0.291 | 0.079 | 0.017 | 0.009 | 0.008 |
| Sales of water heating units - Electric Heat Pump | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 |
| Sales of water heating units - Electric Resistance | 0.038 | 0.039 | 0.038 | 0.038 | 0.039 | 0.038 | 0.039 |
| Sales of water heating units - Gas Furnace | 0.941 | 0.941 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Sales of water heating units - Other | 0.017 | 0.017 | 0.017 | 0.017 | 0.017 | 0.017 | 0.017 |

Table 12: *E- scenario - PILLAR 1: Efficiency/Electrification - Electricity demand*

| variable_name | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|
| Electricity distribution peak load (capital invested) - Cumulative 5-yr | 173.899 | 178.273 | 262.017 | 275.84 | 263.486 | 274.193 |

Table 13: *RE- scenario - PILLAR 1: Efficiency/Electrification - Residential*

| variable_name | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|
| Residential HVAC investment in 2020s vs. REF - Cumulative 5-yr | 0 | 253.778 | 307.165 | 0 | 0 | 0 | 0 |
| Sale of space heating units by type - Electric Heat Pump | 0.146 | 0.272 | 0.644 | 0.85 | 0.88 | 0.881 | 0.881 |
| Sale of space heating units by type - Electric Resistance | 0.203 | 0.226 | 0.123 | 0.081 | 0.076 | 0.077 | 0.077 |
| Sale of space heating units by type - Fossil | 0.1 | 0.132 | 0.062 | 0.034 | 0.03 | 0.029 | 0.029 |
| Sale of space heating units by type - Gas | 0.552 | 0.369 | 0.171 | 0.035 | 0.015 | 0.013 | 0.013 |
| Sales of cooking units - Electric Resistance | 0.613 | 0.696 | 0.948 | 0.997 | 1 | 1 | 1 |
| Sales of cooking units - Gas | 0.387 | 0.304 | 0.052 | 0.003 | 0 | 0 | 0 |
| Sales of water heating units by type - Electric Heat Pump | 0 | 0.074 | 0.418 | 0.562 | 0.585 | 0.592 | 0.59 |
| Sales of water heating units by type - Electric Resistance | 0.384 | 0.492 | 0.385 | 0.398 | 0.399 | 0.393 | 0.395 |
| Sales of water heating units by type - Gas Furnace | 0.58 | 0.409 | 0.18 | 0.026 | 0.002 | 0 | 0 |
| Sales of water heating units by type - Other | 0.036 | 0.025 | 0.016 | 0.015 | 0.015 | 0.015 | 0.015 |

Table 14: *RE- scenario - PILLAR 1: Efficiency/Electrification - Transportation*

| variable_name | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|
| End-use technology sales by technology - HDV - diesel | 0.972 | 0.921 | 0.67 | 0.233 | 0.042 | 0.006 | 0 |
| End-use technology sales by technology - HDV - EV | 0.006 | 0.038 | 0.19 | 0.456 | 0.574 | 0.596 | 0.6 |
| End-use technology sales by technology - HDV - gasoline | 0.002 | 0.002 | 0.002 | 0.001 | 0 | 0 | 0 |
| End-use technology sales by technology - HDV - hybrid | 0.001 | 0.001 | 0.001 | 0 | 0 | 0 | 0 |
| End-use technology sales by technology - HDV - hydrogen FC | 0.004 | 0.025 | 0.127 | 0.304 | 0.382 | 0.397 | 0.4 |
| End-use technology sales by technology - HDV - other | 0.015 | 0.012 | 0.011 | 0.006 | 0.002 | 0 | 0 |
| End-use technology sales by technology - LDV - diesel | 0.014 | 0.017 | 0.012 | 0.004 | 0.001 | 0 | 0 |
| End-use technology sales by technology - LDV - EV | 0.044 | 0.167 | 0.487 | 0.827 | 0.964 | 0.993 | 1 |
| End-use technology sales by technology - LDV - gasoline | 0.891 | 0.763 | 0.464 | 0.156 | 0.032 | 0.006 | 0 |
| End-use technology sales by technology - LDV - hybrid | 0.049 | 0.049 | 0.034 | 0.012 | 0.003 | 0.001 | 0 |
| End-use technology sales by technology - LDV - hydrogen FC | 0.001 | 0.003 | 0.002 | 0.001 | 0 | 0 | 0 |
| End-use technology sales by technology - LDV - other | 0.001 | 0.001 | 0.001 | 0 | 0 | 0 | 0 |
| End-use technology sales by technology - MDV - diesel | 0.647 | 0.597 | 0.423 | 0.144 | 0.026 | 0.004 | 0 |
| End-use technology sales by technology - MDV - EV | 0.008 | 0.051 | 0.253 | 0.608 | 0.765 | 0.795 | 0.8 |
| End-use technology sales by technology - MDV - gasoline | 0.337 | 0.333 | 0.255 | 0.093 | 0.018 | 0.003 | 0 |
| End-use technology sales by technology - MDV - hybrid | 0.004 | 0.004 | 0.003 | 0.001 | 0 | 0 | 0 |
| End-use technology sales by technology - MDV - hydrogen FC | 0.002 | 0.013 | 0.063 | 0.152 | 0.191 | 0.199 | 0.2 |
| End-use technology sales by technology - MDV - other | 0.003 | 0.003 | 0.002 | 0.001 | 0 | 0 | 0 |
| Light-duty vehicle capital costs - Cumulative 5-yr | 0 | 51476841415 | 133973506553 | 213804645674 | 325179981513 | 352491847981 | 336852237072 |
| Number of public EV charging plugs - DC Fast Charging | 14392 | 0 | 93854.9 | 0 | 390761.1 | 0 | 628020.9 |
| Number of public EV charging plugs - L2 Charging | 66179 | 0 | 2256327 | 0 | 9394267 | 0 | 15098243 |

Table 15: *RE- scenario - PILLAR 2: Clean Electricity - Generating capacity*

| variable_name | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|
| Power generation capital investment - biomass power plant | 0 | 0 | 0.005 | 0.001 | 0.003 | 0.001 | 0 |
| Power generation capital investment - biomass w/ccu allam power plant | 0 | 0 | 0 | 0.349 | 0.094 | 0.108 | 0.381 |
| Power generation capital investment - biomass w/ccu power plant | 0 | 0 | 19.37 | 0.015 | 30.058 | 20.699 | 2.419 |

Table 15: *RE- scenario - PILLAR 2: Clean Electricity - Generating capacity (continued)*

| variable_name | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|
| Power generation capital investment - Offshore Wind - Base | 0 | 3.923 | 9.992 | 31.863 | 47.468 | 98.932 | 120.436 |
| Power generation capital investment - Offshore Wind - Constrained | 0 | 3.936 | 10.044 | 31.627 | 41.407 | 67.51 | 85.241 |
| Power generation capital investment - Solar PV - Base | 0 | 105.253 | 203.46 | 294.591 | 271.469 | 295.267 | 276.543 |
| Power generation capital investment - Solar PV - Constrained | 0 | 175.599 | 220.637 | 290.328 | 273.327 | 285.446 | 260.62 |
| Power generation capital investment - Wind - Base | 0 | 95.924 | 275.116 | 301.523 | 350.059 | 278.079 | 301.792 |
| Power generation capital investment - Wind - Constrained | 0 | 139.06 | 295.822 | 334.008 | 383.256 | 221.743 | 400.73 |

Table 16: *RE- scenario - PILLAR 2: Clean Electricity - Generation*

| variable_name | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|
| Power generation by technology - biomass power plant | 3539.6 | 820.076 | 10266 | 6545.5 | 3884 | 1366 | 57.865 |
| Power generation by technology - biomass w/ccu allam power plant | 0 | 0 | 0 | 265.038 | 293.945 | 386.35 | 766.869 |
| Power generation by technology - biomass w/ccu power plant | 0 | 0 | 21700.6 | 21661.2 | 53456 | 76143.4 | 78945.6 |

Table 17: *RE- scenario - PILLAR 2: Clean Electricity - Transmission*

| variable_name | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|
| HV transmission for wind and solar - base | 0 | 0.137 | 0.34 | 0.663 | 1.099 | 1.587 | 2.158 |
| HV transmission for wind and solar - base all | 0 | 68694.1 | 172509.1 | 351769.1 | 591399.1 | 898920.7 | 1316867 |
| HV transmission for wind and solar - base other intra-state | 0 | 26095.5 | 62059.7 | 129262.6 | 222705.8 | 353200.6 | 505684.5 |
| HV transmission for wind and solar - base spur intra-state | 0 | 22733.1 | 57119.7 | 114114 | 186263.7 | 274136.7 | 400129.7 |
| HV transmission for wind and solar - constrained | 0 | 0.162 | 0.43 | 0.815 | 1.301 | 1.792 | 2.474 |
| HV transmission for wind and solar - constrained all | 0 | 80344.6 | 210831.6 | 406652.6 | 659708.4 | 928011.5 | 1409892 |
| HV transmission for wind and solar - constrained other intra-state | 0 | 25273.1 | 60848.4 | 126169.3 | 216187.2 | 315661.7 | 454335.5 |
| HV transmission for wind and solar - constrained spur intra-state | 0 | 22271.8 | 60626.7 | 115882.4 | 191192.5 | 268545.9 | 411147.6 |

Table 18: *RE- scenario - PILLAR 3: Bioenergy and Hydrogen - Bioconversion*

| variable_name | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|
| Biomass converted - BECCS-H2 | 0 | 0 | 0 | 73607.3 | 137070.5 | 279102 | 426954.9 |
| Biomass converted - Biopower | 10423.3 | 20616.5 | 56096.9 | 42541.3 | 34517 | 26793.3 | 638.908 |
| Biomass converted - Biopower w/ cc | 0 | 0 | 13108.2 | 13204 | 32422.5 | 46168.4 | 48032.7 |
| Biomass converted - ethanol | 129506.1 | 129506.1 | 129536.4 | 125006.1 | 67633.6 | 10261.1 | 905.319 |
| Biomass converted - FT diesel | 0 | 0 | 0 | 90.511 | 101.293 | 104.215 | 79.09 |
| Biomass converted - FT diesel w/ cc | 0 | 0 | 0 | 108.032 | 124.453 | 155.862 | 209.451 |
| Biomass converted - pyrolysis liquids | 0 | 0 | 0 | 148.683 | 170.171 | 197.061 | 14252 |
| Biomass converted - pyrolysis liquids w/ cc | 0 | 0 | 0 | 101.558 | 118.306 | 163.606 | 93275.9 |
| Biomass converted - SNG | 0 | 7.129 | 10.702 | 7.199 | 6.761 | 6.789 | 2.632 |
| Biomass converted - SNG w/ cc | 0 | 0 | 19.174 | 11.834 | 9.259 | 8.74 | 7.283 |
| Biomass purchases | 0 | 0.376 | 2.305 | 7.301 | 12.635 | 23.36 | 41.544 |
| Capital investment | 0 | 0 | 21.854 | 0 | 178.358 | 0 | 531.516 |
| Number of facilities - allam power w ccu | 0 | 0 | 0 | 14 | 21 | 32 | 44 |
| Number of facilities - beccs hydrogen | 0 | 0 | 0 | 95 | 183 | 377 | 563 |
| Number of facilities - diesel | 0 | 0 | 0 | 14 | 14 | 15 | 16 |
| Number of facilities - diesel ccu | 0 | 0 | 0 | 14 | 23 | 34 | 45 |
| Number of facilities - power | 0 | 12 | 16 | 16 | 17 | 17 | 17 |
| Number of facilities - power ccu | 0 | 0 | 26 | 30 | 57 | 81 | 95 |
| Number of facilities - pyrolysis | 0 | 0 | 0 | 14 | 14 | 15 | 31 |
| Number of facilities - pyrolysis ccu | 0 | 0 | 0 | 14 | 23 | 34 | 171 |
| Number of facilities - sng | 0 | 14 | 15 | 15 | 15 | 16 | 17 |
| Number of facilities - sng ccu | 0 | 0 | 14 | 14 | 14 | 19 | 22 |

Table 19: *RE- scenario - PILLAR 4: CO2 capture, use, storage - CO2 capture*

| variable_name | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|
| Annual - All | 0 | 38.19 | 223.76 | 396.83 | 669.96 | 1016.1 |
| Annual - BECCS | 0 | 21.49 | 132.54 | 259.5 | 495.71 | 809.56 |
| Annual - Cement | 0 | 16.2 | 50.27 | 82.99 | 109.45 | 123.65 |
| Annual - NGCC | 0 | 0.49 | 40.94 | 54.38 | 64.76 | 82.83 |
| Cumulative - All | 0 | 38.19 | 261.95 | 658.78 | 1328.7 | 2344.8 |
| Cumulative - BECCS | 0 | 21.49 | 154.03 | 413.53 | 909.24 | 1718.8 |
| Cumulative - Cement | 0 | 16.2 | 66.47 | 149.46 | 258.91 | 382.56 |
| Cumulative - NGCC | 0 | 0.49 | 41.43 | 95.81 | 160.57 | 243.4 |

Table 20: *RE- scenario - PILLAR 4: CO2 capture, use, storage - CO2 storage*

| variable_name | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|
| Annual | 0 | 64.74 | 245.72 | 435.41 | 686.82 | 929.11 |
| Injection wells | 0 | 71 | 356 | 612 | 998 | 1260 |
| Resource characterization, appraisal and permitting costs cumulative | 1500 | 8749.9 | 12999.9 | 12999.9 | 12999.9 | 12999.9 |
| Wells and facilities construction costs cumulative | 0 | 2263.9 | 10682.8 | 18482.8 | 29950 | 37859.6 |

Table 21: *RE- scenario - PILLAR 4: CO2 capture, use, storage - CO2 transportation*

| variable_name | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|
| CO2 pipelines - All | 3706707.577 | 69266994.5 | 115153131 | 124077408 | 140031066.1 | 167219478.7 |
| CO2 pipelines - Spur | 0 | 2978824.5 | 14476063.1 | 23400340 | 39353998.2 | 66542410.8 |
| CO2 pipelines - Trunk | 3706707.577 | 66288170.1 | 100677067.9 | 100677067.9 | 100677067.9 | 100677067.9 |

Table 22: *RE- scenario - IMPACTS - Jobs*

| variable_name | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|
| Jobs by economic sector - agriculture | 30973.3 | 31615.8 | 38522.4 | 43996.3 | 38633.7 | 36139.1 | 47266.5 |
| Jobs by economic sector - construction | 517652.8 | 580064.3 | 723844.9 | 923206.6 | 1030957 | 1125842 | 1362050 |
| Jobs by economic sector - manufacturing | 425437 | 626159.2 | 816219 | 958345.6 | 880896.8 | 806618.9 | 910451.1 |
| Jobs by economic sector - mining | 560221.7 | 458886.5 | 352163.3 | 267470.4 | 175190 | 114496 | 65837 |
| Jobs by economic sector - other | 47551 | 55962.9 | 80318.3 | 117907.3 | 146042.4 | 174988.7 | 239732.9 |
| Jobs by economic sector - pipeline | 45065.7 | 46152.7 | 47909 | 40499.8 | 29005 | 22744.3 | 20677.8 |
| Jobs by economic sector - professional | 297333.6 | 329442.1 | 391193.7 | 505157.5 | 591345.1 | 679997.5 | 852768.2 |
| Jobs by economic sector - trade | 311803.6 | 298080.7 | 309841.5 | 357202.8 | 384374.8 | 422446.3 | 520016.9 |
| Jobs by economic sector - utilities | 420315.8 | 479672 | 554949.6 | 731228.5 | 852602.9 | 944853.2 | 1147421 |
| Jobs by resource sector - Biomass | 82013.9 | 83447.8 | 93313.4 | 109173.7 | 106831.1 | 133052.8 | 206230.8 |
| Jobs by resource sector - CO2 | 0 | 4516.9 | 63856.1 | 54810.9 | 25821.3 | 39490.7 | 74648.6 |
| Jobs by resource sector - Coal | 155501.6 | 69612.2 | 18956 | 10843 | 9382.9 | 8412.2 | 7425.7 |
| Jobs by resource sector - Grid | 443187.5 | 545890.6 | 721001.8 | 1124114 | 1403724 | 1633410 | 2020076 |
| Jobs by resource sector - Natural Gas | 553554.7 | 560895.8 | 449992.7 | 363388.6 | 321218.8 | 224534.2 | 157167.4 |
| Jobs by resource sector - Nuclear | 50515.3 | 50076.7 | 48496.4 | 48678 | 37103.9 | 36098 | 53115.3 |
| Jobs by resource sector - Oil | 840191.4 | 790088.1 | 693931.8 | 596615.7 | 431489.9 | 318937.6 | 201942.8 |
| Jobs by resource sector - Solar | 410730.2 | 515805.5 | 734742.8 | 960730.6 | 1000054 | 1068804 | 1380406 |
| Jobs by resource sector - Wind | 120659.9 | 285702.6 | 490670.8 | 676660.6 | 793422 | 865386.4 | 1065209 |
| Median wages - Biomass | 50690.5 | 51939.1 | 53203.6 | 55102.8 | 58458.1 | 62414.6 | 64159.8 |
| Median wages - CO2 | 0 | 63114.5 | 62868.6 | 64234.3 | 66183.7 | 67224 | 67032 |
| Median wages - Coal | 57955.1 | 60500.6 | 59195.4 | 55643.3 | 56540.5 | 57484.4 | 58468.8 |
| Median wages - Grid | 61740.9 | 62539.4 | 63374.7 | 64247.5 | 65158.9 | 66110 | 67101.8 |
| Median wages - Natural Gas | 65532.4 | 66243.7 | 67110.3 | 67844 | 68369.4 | 69119.3 | 69706.3 |
| Median wages - Nuclear | 69863.4 | 71485.6 | 73188 | 74973.6 | 76845.7 | 78807.8 | 80863.5 |
| Median wages - Oil | 64938 | 65834.2 | 66719.8 | 67649.9 | 68455.6 | 69277.4 | 69993 |
| Median wages - Solar | 55136.4 | 55417.7 | 56093.4 | 56985 | 58064.3 | 59154.7 | 60323 |
| Median wages - Wind | 58848.4 | 58179.4 | 59132.2 | 60462.1 | 62327.1 | 64299.3 | 65506.7 |
| Required Level of Education - Associates degree or some college | 1049546.7 | 1032219.7 | 1119283 | 1335571.1 | 1412200.3 | 1522944.7 | 1882301.7 |
| Required Level of Education - Bachelors degree | 788588.8 | 764941.5 | 795729.4 | 914642.9 | 948631.3 | 1030586.7 | 1285534.8 |
| Required Level of Education - Doctoral degree | 27507.2 | 26740.466 | 27745.275 | 32545.372 | 35636.352 | 41590.748 | 54444.432 |
| Required Level of Education - High school diploma or less | 1635415.9 | 1565139.3 | 1698800 | 1995623.6 | 2033950.9 | 2136105.4 | 2631461.9 |
| Required Level of Education - Masters or professional degree | 189074.2 | 183879.3 | 190745.596 | 221412.94 | 234784.996 | 261310.056 | 331316.648 |
| Wage income - Biomass | 4157324848 | 4334203820 | 4964611573 | 6015781254 | 6245144103 | 8304435880 | 13231734435 |
| Wage income - CO2 | 0 | 285083511 | 4014541449 | 3520742486 | 1708950607 | 2654722015 | 5003845103 |
| Wage income - Coal | 9012112206 | 4211577913 | 1122109486 | 603340194 | 530515755 | 483568286 | 434170557 |
| Wage income - Grid | 27362776912 | 34139686964 | 45693255154 | 72221511666 | 91465173297 | 107984701627 | 135550701811 |
| Wage income - Natural Gas | 36275768741 | 37155828008 | 30199159667 | 24653743186 | 21961538016 | 15519653187 | 10955548656 |
| Wage income - Nuclear | 3529169697 | 3579762686 | 3549356232 | 3649566810 | 2851274494 | 2844798384 | 4295092365 |
| Wage income - Oil | 54560338263 | 52014843594 | 46299008761 | 40361003755 | 29537894500 | 22095171414 | 14134586506 |
| Wage income - Solar | 22646181773 | 28584757065 | 41214195383 | 54747274222 | 58067417144 | 63224789718 | 83270275583 |
| Wage income - Wind | 7100647657 | 16622012619 | 29014434622 | 40912326159 | 49451729345 | 55643699442 | 69778281164 |

Table 23: *RE- scenario - PILLAR 6: Land carbon sinks - Agriculture*

| variable_name | 2050 |
|---|---|
| Carbon sink enhancement potential - Accelerate regeneration | 85600 |
| Carbon sink enhancement potential - All (not counting overlap) | 2556100 |
| Carbon sink enhancement potential - Avoid deforestation | 133000 |
| Carbon sink enhancement potential - corn-ethanol to energy grasses | -46572.044 |
| Carbon sink enhancement potential - cropland measures | -309933.22 |
| Carbon sink enhancement potential - Extend rotation length | 511000 |
| Carbon sink enhancement potential - Improve plantations | 99500 |
| Carbon sink enhancement potential - Increase retention of HWP | 5e+05 |
| Carbon sink enhancement potential - Increase trees outside forests | 100500 |
| Carbon sink enhancement potential - permanent conservation cover | -11086.983 |
| Carbon sink enhancement potential - Reforest cropland | 423500 |
| Carbon sink enhancement potential - Reforest pasture | 406000 |
| Carbon sink enhancement potential - Restore productivity | 297000 |
| Carbon sink enhancement potential - total | -367592.247 |
| Land impacted for carbon sink enhancement - Accelerate regeneration | 34500 |
| Land impacted for carbon sink enhancement - All (not counting overlap) | 505500 |
| Land impacted for carbon sink enhancement - Avoid deforestation | 35702 |
| Land impacted for carbon sink enhancement - corn-ethanol to energy grasses | 22574.8 |
| Land impacted for carbon sink enhancement - cropland measures | 207795.4 |
| Land impacted for carbon sink enhancement - Extend rotation length | 281500 |
| Land impacted for carbon sink enhancement - Improve plantations | 55300 |
| Land impacted for carbon sink enhancement - Increase retention of HWP | 1e+05 |
| Land impacted for carbon sink enhancement - Increase trees outside forests | 28350 |
| Land impacted for carbon sink enhancement - permanent conservation cover | 19123.8 |
| Land impacted for carbon sink enhancement - Reforest cropland | 141000 |
| Land impacted for carbon sink enhancement - Reforest pasture | 30700 |
| Land impacted for carbon sink enhancement - Restore productivity | 167600 |
| Land impacted for carbon sink enhancement - total | 249494 |
| Land impacted for carbon sink enhancement - Total impacted (over 30 years) | 369152 |

Table 24: *RE- scenario - PILLAR 6: Land carbon sinks - Forests*

| variable_name | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|
| Business-as-usual carbon sink - Accelerate regeneration | 0 | 0 | 0 | 0 | 0 | 0 | 8000 |
| Business-as-usual carbon sink - Avoid deforestation | 0 | 0 | 0 | 0 | 0 | 0 | 11373 |
| Business-as-usual carbon sink - Extend rotation length | 0 | 0 | 0 | 0 | 0 | 0 | 154000 |
| Business-as-usual carbon sink - Improve plantations | 0 | 0 | 0 | 0 | 0 | 0 | 21000 |
| Business-as-usual carbon sink - Increase retention of HWP | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Business-as-usual carbon sink - Increase trees outside forests | 0 | 0 | 0 | 0 | 0 | 0 | 5700 |
| Business-as-usual carbon sink - Reforest cropland | 0 | 0 | 0 | 0 | 0 | 0 | 16000 |
| Business-as-usual carbon sink - Reforest pasture | 0 | 0 | 0 | 0 | 0 | 0 | 7500 |
| Business-as-usual carbon sink - Restore productivity | 0 | 0 | 0 | 0 | 0 | 0 | 59000 |
| Business-as-usual carbon sink - Total impacted (over 30 years) | 0 | 0 | 0 | 0 | 0 | 0 | 16000 |
| Carbon sink enhancement potential | -0.7 | -0.73 | -0.75 | -0.78 | -0.8 | -0.83 | -0.85 |
| Carbon sink enhancement potential - CO2 Transport & Storage | 3e+05 | 93030861 | 47644456 | 6654415 | 11394496 | 30441244 | 0 |
| Carbon sink enhancement potential - Distribution | 35951432 | 37014162 | 65427424 | 69908970 | 61736484 | 64636276 | 0 |
| Carbon sink enhancement potential - Fuels Conversion | 2429403 | 3801169 | 36782492 | 67209434 | 108509869 | 245775034 | 0 |
| Carbon sink enhancement potential - Power Generation | 107940476 | 133433447 | 205015494 | 258177396 | 271628466 | 349697749 | 0 |
| Carbon sink enhancement potential - Total System | 257444487 | 430624463 | 591164954 | 730418725 | 873913203 | 1258030701 | 0 |
| Carbon sink enhancement potential - Transmission | 110823176 | 163344824 | 236295089 | 328468510 | 420643888 | 567480398 | 0 |

Table 25: *RE- scenario - IMPACTS - Fossil fuel industries*

| variable_name | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|
| Natural gas consumption | 22866725 | 23206324 | 19561621 | 15689227 | 11810616 | 7430843 | 5153838 |
| Oil consumption | 6207817 | 5923784 | 5196445 | 4118901 | 3106188 | 2308001 | 1649753 |

Table 26: *RE- scenario - PILLAR 1: Efficiency/Electrification - Overview*

| variable_name | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|
| Final energy demand by sector - commercial | 9.015 | 8.942 | 8.619 | 8.103 | 7.608 | 7.344 | 7.297 |
| Final energy demand by sector - industry | 25.107 | 26.056 | 26.11 | 25.372 | 25.108 | 24.87 | 24.572 |
| Final energy demand by sector - residential | 11.788 | 11.09 | 10.221 | 8.966 | 7.776 | 6.967 | 6.512 |
| Final energy demand by sector - transportation | 27.996 | 26.39 | 23.464 | 19.872 | 16.608 | 14.565 | 13.649 |

Table 27: *RE- scenario - PILLAR 1: Efficiency/Electrification - Commercial*

| variable_name | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|
| Commercial HVAC investment in 2020s - Cumulative 5-yr | 0 | 1047657176246 | 1162511473622 | 0 | 0 | 0 | 0 |
| Sales of cooking units - Electric Resistance | 0.325 | 0.464 | 0.8 | 0.866 | 0.87 | 0.87 | 0.87 |
| Sales of cooking units - Gas | 0.675 | 0.536 | 0.2 | 0.134 | 0.13 | 0.13 | 0.13 |
| Sales of space heating units - Electric Heat Pump | 0.03 | 0.176 | 0.529 | 0.769 | 0.806 | 0.808 | 0.808 |
| Sales of space heating units - Electric Resistance | 0.079 | 0.091 | 0.144 | 0.177 | 0.184 | 0.184 | 0.184 |
| Sales of space heating units - Fossil | 0.039 | 0.033 | 0.007 | 0 | 0 | 0 | 0 |
| Sales of space heating units - Gas Furnace | 0.852 | 0.701 | 0.321 | 0.054 | 0.011 | 0.008 | 0.008 |
| Sales of water heating units - Electric Heat Pump | 0.004 | 0.08 | 0.433 | 0.592 | 0.612 | 0.613 | 0.613 |
| Sales of water heating units - Electric Resistance | 0.038 | 0.072 | 0.24 | 0.357 | 0.375 | 0.376 | 0.376 |
| Sales of water heating units - Gas Furnace | 0.941 | 0.833 | 0.315 | 0.04 | 0.002 | 0 | 0 |
| Sales of water heating units - Other | 0.017 | 0.016 | 0.012 | 0.011 | 0.011 | 0.011 | 0.011 |

Table 28: *RE- scenario - PILLAR 1: Efficiency/Electrification - Electricity demand*

| variable_name | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|
| Electricity distribution peak load (capital invested) - Cumulative 5-yr | 181.883 | 187.197 | 336.103 | 358.511 | 314.481 | 328.979 |

Table 29: *REF scenario - PILLAR 1: Efficiency/Electrification - Residential*

| variable_name | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|
| Residential HVAC investment in 2020s vs. REF - Cumulative 5-yr | 0 | 252.349 | 303.314 | 0 | 0 | 0 | 0 |
| Sale of space heating units by type - Electric Heat Pump | 0.146 | 0.21 | 0.252 | 0.376 | 0.584 | 0.751 | 0.824 |
| Sale of space heating units by type - Electric Resistance | 0.203 | 0.244 | 0.232 | 0.199 | 0.143 | 0.103 | 0.087 |
| Sale of space heating units by type - Fossil | 0.1 | 0.145 | 0.138 | 0.114 | 0.077 | 0.05 | 0.04 |
| Sale of space heating units by type - Gas | 0.552 | 0.4 | 0.377 | 0.311 | 0.196 | 0.096 | 0.049 |
| Sales of cooking units - Electric Resistance | 0.612 | 0.622 | 0.658 | 0.751 | 0.881 | 0.962 | 0.99 |
| Sales of cooking units - Gas | 0.388 | 0.378 | 0.342 | 0.249 | 0.119 | 0.038 | 0.01 |
| Sales of water heating units by type - Electric Heat Pump | 0 | 0.014 | 0.052 | 0.167 | 0.352 | 0.493 | 0.553 |
| Sales of water heating units by type - Electric Resistance | 0.384 | 0.515 | 0.503 | 0.47 | 0.421 | 0.396 | 0.389 |
| Sales of water heating units by type - Gas Furnace | 0.58 | 0.445 | 0.419 | 0.34 | 0.208 | 0.094 | 0.042 |
| Sales of water heating units by type - Other | 0.036 | 0.026 | 0.025 | 0.023 | 0.019 | 0.017 | 0.016 |

Table 30: *REF scenario - PILLAR 1: Efficiency/Electrification - Transportation*

| variable_name | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|
| End-use technology sales by technology - HDV - diesel | 0.974 | 0.96 | 0.913 | 0.798 | 0.582 | 0.321 | 0.137 |
| End-use technology sales by technology - HDV - EV | 0.005 | 0.015 | 0.041 | 0.108 | 0.236 | 0.394 | 0.51 |
| End-use technology sales by technology - HDV - gasoline | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.001 | 0.001 |
| End-use technology sales by technology - HDV - hybrid | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0 |
| End-use technology sales by technology - HDV - hydrogen FC | 0.003 | 0.01 | 0.027 | 0.072 | 0.157 | 0.263 | 0.34 |
| End-use technology sales by technology - HDV - other | 0.015 | 0.013 | 0.015 | 0.019 | 0.022 | 0.02 | 0.011 |
| End-use technology sales by technology - LDV - diesel | 0.014 | 0.018 | 0.02 | 0.016 | 0.01 | 0.005 | 0.002 |
| End-use technology sales by technology - LDV - EV | 0.041 | 0.064 | 0.126 | 0.271 | 0.497 | 0.729 | 0.879 |
| End-use technology sales by technology - LDV - gasoline | 0.894 | 0.855 | 0.784 | 0.651 | 0.447 | 0.239 | 0.106 |

Table 30: *REF scenario - PILLAR 1: Efficiency/Electrification - Transportation (continued)*

| variable_name | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|
| End-use technology sales by technology - LDV - hybrid | 0.05 | 0.058 | 0.065 | 0.059 | 0.043 | 0.025 | 0.012 |
| End-use technology sales by technology - LDV - hydrogen FC | 0.001 | 0.004 | 0.003 | 0.002 | 0.002 | 0.001 | 0 |
| End-use technology sales by technology - LDV - other | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0 | 0 |
| End-use technology sales by technology - MDV - diesel | 0.648 | 0.622 | 0.577 | 0.494 | 0.356 | 0.196 | 0.084 |
| End-use technology sales by technology - MDV - EV | 0.007 | 0.019 | 0.055 | 0.143 | 0.314 | 0.526 | 0.68 |
| End-use technology sales by technology - MDV - gasoline | 0.338 | 0.347 | 0.347 | 0.319 | 0.244 | 0.142 | 0.063 |
| End-use technology sales by technology - MDV - hybrid | 0.004 | 0.004 | 0.005 | 0.005 | 0.004 | 0.003 | 0.001 |
| End-use technology sales by technology - MDV - hydrogen FC | 0.002 | 0.005 | 0.014 | 0.036 | 0.079 | 0.132 | 0.17 |
| End-use technology sales by technology - MDV - other | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.002 | 0.001 |
| Light-duty vehicle capital costs - Cumulative 5-yr | 0 | 0 | 8683057185 | 17455167507 | 59707099873 | 185491426113 | 271067675944 |
| Number of public EV charging plugs - DC Fast Charging | 14392 | 0 | 31869.5 | 0 | 147137.9 | 0 | 402247 |
| Number of public EV charging plugs - L2 Charging | 66179 | 0 | 766142.2 | 0 | 3537320 | 0 | 9670415 |

Table 31: *REF scenario - PILLAR 2: Clean Electricity - Generating capacity*

| variable_name | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|
| Power generation capital investment - biomass power plant | 0 | 0.001 | 0.009 | 0 | 0 | 0 | 0.012 |
| Power generation capital investment - biomass w/ccu allam power plant | 0 | 0 | 0 | 0.477 | 0.303 | 0.322 | 0.134 |
| Power generation capital investment - biomass w/ccu power plant | 0 | 0 | 65.896 | 57.408 | 23.946 | 0.913 | 0.238 |

Table 32: *REF scenario - PILLAR 2: Clean Electricity - Generation*

| variable_name | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|
| Power generation by technology - biomass power plant | 3563.6 | 882.718 | 10475.4 | 3400.7 | 1583.5 | 156.681 | 35.012 |
| Power generation by technology - biomass w/ccu allam power plant | 0 | 0 | 0 | 390.97 | 668.209 | 982.891 | 1032.7 |
| Power generation by technology - biomass w/ccu power plant | 0 | 0 | 73933 | 138288.4 | 161856.2 | 164137.1 | 147858.7 |

Table 33: *REF scenario - PILLAR 3: Bioenergy and Hydrogen - Bioconversion*

| variable_name | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|
| Biomass converted - BECCS-H2 | 0 | 0 | 0 | 143696.8 | 365549 | 383408.2 | 381319 |
| Biomass converted - Biopower | 12353.2 | 27983.2 | 56287.1 | 38442.3 | 4029.2 | 416.216 | 43.31 |
| Biomass converted - Biopower w/ cc | 0 | 0 | 44658.9 | 83709 | 98070.1 | 99589.8 | 89779.3 |
| Biomass converted - ethanol | 129505.7 | 129505.8 | 129536.4 | 125006.1 | 67633.6 | 10261.1 | 905.319 |
| Biomass converted - FT diesel | 0 | 0 | 0 | 102.9 | 97.24 | 78.243 | 60.153 |
| Biomass converted - FT diesel w/ cc | 0 | 0 | 0 | 147.925 | 207.193 | 242.32 | 231.346 |
| Biomass converted - pyrolysis liquids | 0 | 0 | 0 | 197.389 | 5800.6 | 5773.6 | 3174.2 |
| Biomass converted - pyrolysis liquids w/ cc | 0 | 0 | 0 | 160.449 | 2119.2 | 81909 | 109354.9 |
| Biomass converted - SNG | 0 | 8.866 | 15.679 | 8.499 | 7.518 | 5.181 | 1.602 |
| Biomass converted - SNG w/ cc | 0 | 0 | 31.035 | 15.298 | 10.189 | 8.15 | 4.094 |

Table 34: *REF scenario - IMPACTS - Jobs*

| variable_name | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|
| Jobs by economic sector - agriculture | 31148.8 | 32670.8 | 42262.9 | 55525.2 | 55304.4 | 48630.6 | 47266.5 |
| Jobs by economic sector - construction | 519071.5 | 581151 | 740530.5 | 848061.6 | 963235.1 | 1231236 | 1521901 |
| Jobs by economic sector - manufacturing | 428256.7 | 643588.4 | 841652.7 | 842392.2 | 846574.8 | 1022744 | 1121180 |
| Jobs by economic sector - mining | 560377.9 | 459532.7 | 349847.8 | 267959.3 | 202833.5 | 155839.7 | 95673.2 |
| Jobs by economic sector - other | 47778 | 56713.5 | 82057.2 | 105315.1 | 133286.5 | 185286.8 | 253398.4 |
| Jobs by economic sector - pipeline | 45114.2 | 46559.4 | 52127.6 | 44106.3 | 34087 | 32405.4 | 32455.5 |
| Jobs by economic sector - professional | 298013.5 | 329757.5 | 396268.2 | 484819.8 | 601654.8 | 769833.7 | 955468.4 |
| Jobs by economic sector - trade | 312164.4 | 299110.8 | 313314.5 | 344813.4 | 391852.1 | 480920.5 | 587899.9 |
| Jobs by economic sector - utilities | 420721.5 | 467151.2 | 555052.5 | 647545.3 | 754638.2 | 1013321 | 1274330 |
| Jobs by resource sector - Biomass | 82630 | 85041.7 | 102575.1 | 156017.8 | 206407.8 | 207068.1 | 199424.2 |
| Jobs by resource sector - CO2 | 0 | 7188.3 | 108613.4 | 93920.1 | 44745.9 | 67717.8 | 127383.3 |
| Jobs by resource sector - Coal | 155381.6 | 71673.4 | 20450 | 10921.9 | 9493 | 8396.3 | 7200.4 |
| Jobs by resource sector - Grid | 443672.9 | 522228.1 | 687147.6 | 930623.5 | 1195282 | 1738078 | 2236452 |
| Jobs by resource sector - Natural Gas | 554217.4 | 552820.6 | 411650.4 | 307794.6 | 260548.6 | 208656.5 | 168723.9 |
| Jobs by resource sector - Nuclear | 50520.8 | 50088 | 55835.9 | 57634.1 | 55404.1 | 50559.1 | 44543.9 |
| Jobs by resource sector - Oil | 840198.5 | 792878.3 | 708135.5 | 634028.3 | 554637.4 | 474581.4 | 308359.5 |
| Jobs by resource sector - Solar | 415354.5 | 536980 | 767065.2 | 815587.2 | 885177.8 | 1156584 | 1401261 |
| Jobs by resource sector - Wind | 120670.8 | 297336.8 | 511640.7 | 634010.8 | 771770.1 | 1028576 | 1396226 |
| Median wages - Biomass | 50742.3 | 51978.2 | 53602.5 | 56740 | 60498.2 | 62984 | 64202.4 |
| Median wages - CO2 | 0 | 62504.6 | 62789.8 | 64227.8 | 66288.4 | 67224.9 | 66970 |
| Median wages - Coal | 57959.9 | 60563 | 59803.7 | 55633.4 | 56514.7 | 57450.9 | 58452.9 |
| Median wages - Grid | 61740.9 | 62539.4 | 63374.7 | 64247.5 | 65158.9 | 66110 | 67101.8 |
| Median wages - Natural Gas | 65532 | 66265 | 67136.2 | 67770.9 | 68258.4 | 68977.7 | 69759.7 |
| Median wages - Nuclear | 69863.4 | 71485.6 | 73188 | 74973.6 | 76845.7 | 78807.8 | 80863.5 |
| Median wages - Oil | 64938 | 65827.6 | 66678.3 | 67513 | 68348.4 | 69194.4 | 69918.1 |
| Median wages - Solar | 55125.8 | 55398.7 | 56081.8 | 57093.2 | 58128.6 | 59038.2 | 60291.8 |
| Median wages - Wind | 58848.6 | 58121.7 | 59112.9 | 60675.1 | 62324.6 | 63655.5 | 64920.3 |
| Required Level of Education - Associates degree or some college | 262505.3 | 169544.1 | 122499.8 | 171450.8 | 238289.3 | 244757.5 | 235361 |
| Required Level of Education - Bachelors degree | 191140.2 | 132354.2 | 103511.1 | 154918.4 | 232624.9 | 247415.8 | 237818.7 |
| Required Level of Education - Doctoral degree | 7276.462 | 5788.193 | 5153.433 | 8586.784 | 14032.564 | 15536.14 | 15063.604 |
| Required Level of Education - High school diploma or less | 527016.9 | 369471.1 | 334768 | 444940.2 | 518323.8 | 489479.8 | 468348.4 |
| Required Level of Education - Masters or professional degree | 46737.1 | 34744.5 | 28743.32 | 43881.128 | 66740.152 | 71736.924 | 69331.148 |
| Wage income - Biomass | 4192831249 | 4420314415 | 5498276723 | 8852455115 | 12487293424 | 13041986502 | 12803509141 |
| Wage income - CO2 | 0 | 449302916 | 6819817268 | 6032281146 | 2966136569 | 4552321639 | 8530857692 |
| Wage income - Coal | 9005898180 | 4340756464 | 1222988680 | 607622921 | 536491694 | 482378169 | 420883510 |
| Wage income - Grid | 27392746988 | 32659849322 | 43547759175 | 59790246738 | 77883281226 | 114904303642 | 150069908723 |
| Wage income - Natural Gas | 36318990357 | 36632639628 | 27636644549 | 20859524036 | 17784640380 | 14392643847 | 11770128128 |
| Wage income - Nuclear | 3529550516 | 3580574287 | 4086516042 | 4321033939 | 4257567588 | 3984452910 | 3601980141 |

Table 34: *REF scenario - IMPACTS - Jobs (continued)*

| variable_name | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|
| Wage income - Oil | 54560785037 | 52193270245 | 47217245573 | 42805129798 | 37908560709 | 32838371468 | 21559921255 |
| Wage income - Solar | 22896737333 | 29747993676 | 43018415384 | 46564477614 | 51454169089 | 68282642862 | 84484523421 |
| Wage income - Wind | 7101305564 | 17281718034 | 30244555495 | 38468644880 | 48100273093 | 65474511881 | 90643397491 |

Table 35: *REF scenario - PILLAR 6: Land carbon sinks - Agriculture*

| variable_name | 2050 |
|---|---|
| Carbon sink enhancement potential - Accelerate regeneration | 85600 |
| Carbon sink enhancement potential - All (not counting overlap) | 2556100 |
| Carbon sink enhancement potential - Avoid deforestation | 133000 |
| Carbon sink enhancement potential - corn-ethanol to energy grasses | -46572.044 |
| Carbon sink enhancement potential - cropland measures | -309933.22 |
| Carbon sink enhancement potential - Extend rotation length | 511000 |
| Carbon sink enhancement potential - Improve plantations | 99500 |
| Carbon sink enhancement potential - Increase retention of HWP | 5e+05 |
| Carbon sink enhancement potential - Increase trees outside forests | 100500 |
| Carbon sink enhancement potential - permanent conservation cover | -11086.983 |
| Carbon sink enhancement potential - Reforest cropland | 423500 |
| Carbon sink enhancement potential - Reforest pasture | 406000 |
| Carbon sink enhancement potential - Restore productivity | 297000 |
| Carbon sink enhancement potential - total | -367592.247 |
| Land impacted for carbon sink enhancement - Accelerate regeneration | 34500 |
| Land impacted for carbon sink enhancement - All (not counting overlap) | 505500 |
| Land impacted for carbon sink enhancement - Avoid deforestation | 35702 |
| Land impacted for carbon sink enhancement - corn-ethanol to energy grasses | 22574.8 |
| Land impacted for carbon sink enhancement - cropland measures | 207795.4 |
| Land impacted for carbon sink enhancement - Extend rotation length | 281500 |
| Land impacted for carbon sink enhancement - Improve plantations | 55300 |
| Land impacted for carbon sink enhancement - Increase retention of HWP | 1e+05 |
| Land impacted for carbon sink enhancement - Increase trees outside forests | 28350 |
| Land impacted for carbon sink enhancement - permanent conservation cover | 19123.8 |
| Land impacted for carbon sink enhancement - Reforest cropland | 141000 |
| Land impacted for carbon sink enhancement - Reforest pasture | 30700 |
| Land impacted for carbon sink enhancement - Restore productivity | 167600 |
| Land impacted for carbon sink enhancement - total | 249494 |
| Land impacted for carbon sink enhancement - Total impacted (over 30 years) | 369152 |

Table 36: *REF scenario - PILLAR 6: Land carbon sinks - Forests*

| variable_name | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|
| Business-as-usual carbon sink - Accelerate regeneration | 0 | 0 | 0 | 0 | 0 | 0 | 8000 |
| Business-as-usual carbon sink - Avoid deforestation | 0 | 0 | 0 | 0 | 0 | 0 | 11373 |
| Business-as-usual carbon sink - Extend rotation length | 0 | 0 | 0 | 0 | 0 | 0 | 154000 |
| Business-as-usual carbon sink - Improve plantations | 0 | 0 | 0 | 0 | 0 | 0 | 21000 |
| Business-as-usual carbon sink - Increase retention of HWP | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Business-as-usual carbon sink - Increase trees outside forests | 0 | 0 | 0 | 0 | 0 | 0 | 5700 |
| Business-as-usual carbon sink - Reforest cropland | 0 | 0 | 0 | 0 | 0 | 0 | 16000 |
| Business-as-usual carbon sink - Reforest pasture | 0 | 0 | 0 | 0 | 0 | 0 | 7500 |
| Business-as-usual carbon sink - Restore productivity | 0 | 0 | 0 | 0 | 0 | 0 | 59000 |
| Business-as-usual carbon sink - Total impacted (over 30 years) | 0 | 0 | 0 | 0 | 0 | 0 | 16000 |
| Carbon sink enhancement potential | -0.7 | -0.73 | -0.75 | -0.78 | -0.8 | -0.83 | -0.85 |

Table 37: *REF scenario - IMPACTS - Fossil fuel industries*

| variable_name | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|
| Natural gas consumption | 22916979 | 23206763 | 18131613 | 13835402 | 11457788 | 9450642 | 7359221 |
| Oil consumption | 6207962 | 5986544 | 5544620 | 5112245 | 4510421 | 3786266 | 2730357 |

Table 38: *REF scenario - PILLAR 1: Efficiency/Electrification - Overview*

| variable_name | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|
| Final energy demand by sector - commercial | 9.015 | 8.958 | 8.853 | 8.731 | 8.513 | 8.263 | 8.058 |
| Final energy demand by sector - industry | 25.084 | 26.117 | 26.456 | 26.354 | 26.498 | 26.178 | 25.748 |
| Final energy demand by sector - residential | 11.788 | 11.126 | 10.656 | 10.151 | 9.457 | 8.609 | 7.786 |
| Final energy demand by sector - transportation | 28.03 | 26.603 | 24.463 | 22.703 | 21.315 | 19.677 | 17.739 |

Table 39: *REF scenario - PILLAR 1: Efficiency/Electrification - Commercial*

| variable_name | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|
| Commercial HVAC investment in 2020s - Cumulative 5-yr | 0 | 1046837005680 | 1158814975528 | 0 | 0 | 0 | 0 |
| Sales of cooking units - Electric Resistance | 0.325 | 0.365 | 0.413 | 0.538 | 0.712 | 0.819 | 0.856 |
| Sales of cooking units - Gas | 0.675 | 0.635 | 0.587 | 0.462 | 0.288 | 0.181 | 0.144 |
| Sales of space heating units - Electric Heat Pump | 0.03 | 0.119 | 0.159 | 0.276 | 0.481 | 0.659 | 0.742 |
| Sales of space heating units - Electric Resistance | 0.079 | 0.082 | 0.087 | 0.105 | 0.138 | 0.164 | 0.176 |
| Sales of space heating units - Fossil | 0.039 | 0.038 | 0.037 | 0.029 | 0.015 | 0.006 | 0.003 |
| Sales of space heating units - Gas Furnace | 0.852 | 0.761 | 0.717 | 0.59 | 0.366 | 0.171 | 0.079 |
| Sales of water heating units - Electric Heat Pump | 0.004 | 0.018 | 0.058 | 0.174 | 0.366 | 0.512 | 0.573 |
| Sales of water heating units - Electric Resistance | 0.038 | 0.045 | 0.064 | 0.12 | 0.219 | 0.304 | 0.344 |
| Sales of water heating units - Gas Furnace | 0.941 | 0.92 | 0.862 | 0.69 | 0.402 | 0.172 | 0.071 |
| Sales of water heating units - Other | 0.017 | 0.017 | 0.017 | 0.015 | 0.013 | 0.012 | 0.011 |

Table 40: *REF scenario - PILLAR 1: Efficiency/Electrification - Electricity demand*

| variable_name | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|
| Electricity distribution peak load (capital invested) - Cumulative 5-yr | 148.986 | 150.391 | 200.994 | 208.255 | 297.533 | 314.558 |

Table 41: *E+ scenario - PILLAR 2: Clean Electricity - Generating capacity*

| variable_name | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|
| Power generation capital investment - biomass power plant | 0 | 0.001 | 0.006 | 0.011 | 0.001 | 0 | 0 |
| Power generation capital investment - biomass w/ccu allam power plant | 0 | 0 | 0 | 0.175 | 0.15 | 0.086 | 0.162 |
| Power generation capital investment - biomass w/ccu power plant | 0 | 0 | 0.198 | 0.008 | 0.074 | 0.13 | 0.137 |
| Power generation capital investment - Offshore Wind - Base | 0 | 3.952 | 10.267 | 86.095 | 115.022 | 194.151 | 192.527 |
| Power generation capital investment - Solar PV - Base | 0 | 158.398 | 260.712 | 460.38 | 428.886 | 522.696 | 911.352 |
| Power generation capital investment - Wind - Base | 0 | 122.659 | 320.362 | 470.179 | 587.881 | 691.351 | 951.827 |

Table 42: *E+ scenario - PILLAR 2: Clean Electricity - Generation*

| variable_name | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|
| Power generation by technology - biomass power plant | 3548.7 | 620.445 | 9773.1 | 9072.8 | 6438.2 | 2637 | 31.078 |
| Power generation by technology - biomass w/ccu allam power plant | 0 | 0 | 0 | 51.116 | 89.951 | 160.729 | 284.805 |
| Power generation by technology - biomass w/ccu power plant | 0 | 0 | 78.959 | 47.14 | 97.599 | 197.392 | 271.14 |

Table 43: *E+ scenario - PILLAR 2: Clean Electricity - Transmission*

| variable_name | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|
| HV transmission for wind and solar - base | 0 | 0.134 | 0.351 | 0.868 | 1.617 | 2.669 | 4.296 |
| HV transmission for wind and solar - base all | 0 | 70006.7 | 182894.8 | 478684.1 | 897700 | 1562587 | 2538364 |
| HV transmission for wind and solar - base other intra-state | 0 | 26732.8 | 66608.1 | 180851.5 | 332684.3 | 558330.9 | 828068.2 |
| HV transmission for wind and solar - base spur intra-state | 0 | 27602.1 | 69623.6 | 171412.1 | 305134.6 | 523597.7 | 850827.3 |

Table 44: *E+ scenario - PILLAR 3: Bioenergy and Hydrogen - Bioconversion*

| variable_name | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|
| Biomass converted - BECCS-H2 | 0 | 0 | 0 | 2.284 | 19064.8 | 118177.3 | 120885.6 |
| Biomass converted - Biopower | 11647.2 | 16787.8 | 55652.3 | 45493.9 | 37065.9 | 28898.3 | 160.948 |
| Biomass converted - Biopower w/ cc | 0 | 0 | 47.695 | 51.565 | 99.537 | 191.715 | 292.253 |
| Biomass converted - ethanol | 129506.1 | 129505.8 | 129536.4 | 125006.1 | 67633.6 | 10261.1 | 905.319 |
| Biomass converted - FT diesel | 0 | 0 | 0 | 158.173 | 201.386 | 192.685 | 104.102 |
| Biomass converted - FT diesel w/ cc | 0 | 0 | 0 | 67.455 | 112.407 | 276.001 | 351.783 |
| Biomass converted - pyrolysis liquids | 0 | 0 | 0 | 64735 | 133702.3 | 142224.8 | 140053.4 |
| Biomass converted - pyrolysis liquids w/ cc | 0 | 0 | 0 | 65.428 | 117.471 | 7078.4 | 142580.5 |
| Biomass converted - SNG | 0 | 9.336 | 18.912 | 26.002 | 25.636 | 52.179 | 8.785 |
| Biomass converted - SNG w/ cc | 0 | 0 | 9.388 | 4.812 | 7.064 | 45.477 | 179016.3 |

Table 45: *E+ scenario - IMPACTS - Jobs*

| variable_name | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|
| Jobs by economic sector - agriculture | 30787.6 | 31644 | 36897.1 | 42749.5 | 36386.6 | 31196.7 | 47266.5 |
| Jobs by economic sector - construction | 517926.5 | 615091 | 766830.1 | 1095266 | 1315338 | 1662012 | 2268223 |
| Jobs by economic sector - manufacturing | 425996.1 | 708145.4 | 931655.4 | 1298402 | 1269224 | 1433061 | 1851180 |
| Jobs by economic sector - mining | 560235.2 | 455198.7 | 345035.3 | 249120.9 | 151098.3 | 81298.8 | 14201.3 |
| Jobs by economic sector - other | 47588.5 | 62554.5 | 92801 | 154006.3 | 200123.1 | 276352.1 | 415902.7 |
| Jobs by economic sector - pipeline | 45098.2 | 44748.6 | 39488.8 | 31070.6 | 21589.4 | 13203.6 | 3547.6 |
| Jobs by economic sector - professional | 297971.1 | 343678.1 | 420403 | 600437.3 | 759221.2 | 993617.4 | 1406825 |
| Jobs by economic sector - trade | 312257.1 | 307033.9 | 326576.4 | 410762.9 | 477212.7 | 603717.9 | 845202.3 |
| Jobs by economic sector - utilities | 420383.7 | 489094.7 | 552097.7 | 796793.6 | 1016890 | 1333474 | 1878475 |
| Jobs by resource sector - Biomass | 82962.7 | 81618.1 | 89468.8 | 102979.7 | 105775.8 | 117006.1 | 212370.1 |
| Jobs by resource sector - CO2 | 0 | 0.001 | 0.013 | 0.011 | 0.016 | 0.02 | 0.012 |
| Jobs by resource sector - Coal | 155525.3 | 74787.8 | 20480.1 | 10818.8 | 9345.5 | 8380.2 | 6936.6 |
| Jobs by resource sector - Grid | 443177.5 | 577255.8 | 781177.4 | 1340885 | 1797695 | 2488215 | 3609601 |
| Jobs by resource sector - Natural Gas | 553679.1 | 540072.2 | 429684.7 | 313457.5 | 255339.5 | 172227.6 | 130289.3 |
| Jobs by resource sector - Nuclear | 50530.8 | 49935.8 | 47897.1 | 35536.5 | 24294.7 | 14479.6 | 4078.1 |
| Jobs by resource sector - Oil | 840191.5 | 790152 | 691582.8 | 580471 | 394104.7 | 245253 | 39559.3 |
| Jobs by resource sector - Solar | 411484 | 623369.5 | 900002 | 1361648 | 1458654 | 1838529 | 2566564 |
| Jobs by resource sector - Wind | 120693.2 | 319997.6 | 551491.8 | 932811.8 | 1201874 | 1543842 | 2161427 |
| Median wages - Biomass | 50830.9 | 51709.3 | 53024.1 | 54711 | 58634.7 | 62472.5 | 64123.8 |

Table 45: *E+ scenario - IMPACTS - Jobs (continued)*

| variable_name | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|
| Median wages - CO2 | 0 | 70991.6 | 72624.1 | 74330.9 | 76115 | 77979.9 | 79929.1 |
| Median wages - Coal | 57957.8 | 60299.3 | 59830.8 | 55635.1 | 56517.6 | 57460.4 | 58460.7 |
| Median wages - Grid | 61740.9 | 62539.4 | 63374.7 | 64247.5 | 65158.9 | 66110 | 67101.8 |
| Median wages - Natural Gas | 65531.1 | 66255.2 | 67148.5 | 67918.3 | 68399.5 | 68816.1 | 68664.8 |
| Median wages - Nuclear | 69863.4 | 71485.6 | 73188 | 74973.6 | 76845.7 | 78807.8 | 80863.5 |
| Median wages - Oil | 64938 | 65834.1 | 66726.9 | 67654.7 | 68473.4 | 69353.4 | 70883.8 |
| Median wages - Solar | 55134.6 | 55327.1 | 56038.5 | 56875.3 | 57940.8 | 58923.6 | 60008.6 |
| Median wages - Wind | 58849 | 58021.3 | 59082.1 | 60123.1 | 61956.3 | 63600.2 | 64824.6 |
| Required Level of Education - Associates degree or some college | 263238.8 | 169420.5 | 109151.1 | 111838.1 | 121533.2 | 141472.5 | 255914.4 |
| Required Level of Education - Bachelors degree | 192253.7 | 130378.4 | 91449.9 | 93524.1 | 108818.7 | 135549.8 | 250050.1 |
| Required Level of Education - Doctoral degree | 7342.555 | 5582.979 | 4406.899 | 4729.299 | 6182.308 | 8346.924 | 15641.968 |
| Required Level of Education - High school diploma or less | 527061.3 | 367870.3 | 299076.7 | 321876.9 | 298591.8 | 293892.5 | 495545.2 |
| Required Level of Education - Masters or professional degree | 47018.3 | 33990.1 | 25179.612 | 26205.936 | 31134.72 | 39289.724 | 72445.028 |
| Wage income - Biomass | 4217073733 | 4220419953 | 4744006900 | 5634127318 | 6202126445 | 7309661807 | 13617976697 |
| Wage income - CO2 | 0 | 100.651 | 929.212 | 853.466 | 1200.8 | 1560.5 | 932.368 |
| Wage income - Coal | 9013901500 | 4509652379 | 1225341983 | 601904872 | 528183337 | 481529191 | 405518811 |
| Wage income - Grid | 27362164043 | 36101251075 | 49506867452 | 86148539785 | 117135878442 | 164495832986 | 242210625852 |
| Wage income - Natural Gas | 36283195012 | 35782592816 | 28852683169 | 21289509503 | 17465088730 | 11852030469 | 8946290813 |
| Wage income - Nuclear | 3530252667 | 3569693840 | 3505489563 | 2664294889 | 1866945854 | 1141107558 | 329773400 |
| Wage income - Oil | 54560339928 | 52018929232 | 46147153288 | 39271620939 | 26985686784 | 17009142505 | 2804112469 |
| Wage income - Solar | 22687025942 | 34489252080 | 50434762842 | 77444176142 | 84515650625 | 108332782614 | 154015832339 |
| Wage income - Wind | 7102667977 | 18566672267 | 32583297319 | 56083522971 | 74463618608 | 98188745116 | 140113606525 |

Table 46: *E+ scenario - PILLAR 6: Land carbon sinks - Agriculture*

| variable_name | 2050 |
|---|---|
| Carbon sink enhancement potential - Accelerate regeneration | 85600 |
| Carbon sink enhancement potential - All (not counting overlap) | 2556100 |
| Carbon sink enhancement potential - Avoid deforestation | 133000 |
| Carbon sink enhancement potential - corn-ethanol to energy grasses | -46572.044 |
| Carbon sink enhancement potential - cropland measures | -309933.22 |
| Carbon sink enhancement potential - Extend rotation length | 511000 |
| Carbon sink enhancement potential - Improve plantations | 99500 |
| Carbon sink enhancement potential - Increase retention of HWP | 5e+05 |
| Carbon sink enhancement potential - Increase trees outside forests | 100500 |
| Carbon sink enhancement potential - permanent conservation cover | -11086.983 |
| Carbon sink enhancement potential - Reforest cropland | 423500 |
| Carbon sink enhancement potential - Reforest pasture | 406000 |
| Carbon sink enhancement potential - Restore productivity | 297000 |
| Carbon sink enhancement potential - total | -367592.247 |
| Land impacted for carbon sink enhancement - Accelerate regeneration | 34500 |
| Land impacted for carbon sink enhancement - All (not counting overlap) | 505500 |
| Land impacted for carbon sink enhancement - Avoid deforestation | 35702 |
| Land impacted for carbon sink enhancement - corn-ethanol to energy grasses | 22574.8 |
| Land impacted for carbon sink enhancement - cropland measures | 207795.4 |
| Land impacted for carbon sink enhancement - Extend rotation length | 281500 |
| Land impacted for carbon sink enhancement - Improve plantations | 55300 |
| Land impacted for carbon sink enhancement - Increase retention of HWP | 1e+05 |
| Land impacted for carbon sink enhancement - Increase trees outside forests | 28350 |
| Land impacted for carbon sink enhancement - permanent conservation cover | 19123.8 |
| Land impacted for carbon sink enhancement - Reforest cropland | 141000 |
| Land impacted for carbon sink enhancement - Reforest pasture | 30700 |
| Land impacted for carbon sink enhancement - Restore productivity | 167600 |
| Land impacted for carbon sink enhancement - total | 249494 |
| Land impacted for carbon sink enhancement - Total impacted (over 30 years) | 369152 |

Table 47: *E+ scenario - PILLAR 6: Land carbon sinks - Forests*

| variable_name | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|
| Business-as-usual carbon sink - Accelerate regeneration | 0 | 0 | 0 | 0 | 0 | 0 | 8000 |
| Business-as-usual carbon sink - Avoid deforestation | 0 | 0 | 0 | 0 | 0 | 0 | 11373 |
| Business-as-usual carbon sink - Extend rotation length | 0 | 0 | 0 | 0 | 0 | 0 | 154000 |
| Business-as-usual carbon sink - Improve plantations | 0 | 0 | 0 | 0 | 0 | 0 | 21000 |
| Business-as-usual carbon sink - Increase retention of HWP | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Business-as-usual carbon sink - Increase trees outside forests | 0 | 0 | 0 | 0 | 0 | 0 | 5700 |
| Business-as-usual carbon sink - Reforest cropland | 0 | 0 | 0 | 0 | 0 | 0 | 16000 |
| Business-as-usual carbon sink - Reforest pasture | 0 | 0 | 0 | 0 | 0 | 0 | 7500 |
| Business-as-usual carbon sink - Restore productivity | 0 | 0 | 0 | 0 | 0 | 0 | 59000 |
| Business-as-usual carbon sink - Total impacted (over 30 years) | 0 | 0 | 0 | 0 | 0 | 0 | 16000 |

Table 47: *E+ scenario - PILLAR 6: Land carbon sinks - Forests (continued)*

| variable_name | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|
| Carbon sink enhancement potential | -0.7 | -0.73 | -0.75 | -0.78 | -0.8 | -0.83 | -0.85 |

Table 48: *E+ scenario - IMPACTS - Fossil fuel industries*

| variable_name | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|
| Natural gas consumption | 22908650 | 22298808 | 18474290 | 12539192 | 8058540 | 4668813 | 3040012 |
| Oil consumption | 6207817 | 5925221 | 5138865 | 3983700 | 2775937 | 1608163 | 836.971 |

Table 49: *RE+ scenario - PILLAR 2: Clean Electricity - Generating capacity*

| variable_name | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|
| Power generation capital investment - biomass power plant | 0 | 0.001 | 0.245 | 0 | 0 | 0 | 0 |
| Power generation capital investment - biomass w/ccu allam power plant | 0 | 0 | 0 | 0.523 | 0.171 | 0.171 | 0.881 |
| Power generation capital investment - biomass w/ccu power plant | 0 | 0 | 66.288 | 5.886 | 5.649 | 48.633 | 73.909 |

Table 50: *RE+ scenario - PILLAR 2: Clean Electricity - Generation*

| variable_name | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|
| Power generation by technology - biomass power plant | 3615.8 | 794.092 | 14160.1 | 5310.3 | 4477.4 | 2154.7 | 48.036 |
| Power generation by technology - biomass w/ccu allam power plant | 0 | 0 | 0 | 483.81 | 576.454 | 724.626 | 1608.8 |
| Power generation by technology - biomass w/ccu power plant | 0 | 0 | 74391.7 | 80982.8 | 87310.1 | 141851.7 | 224713 |

Table 51: *RE+ scenario - PILLAR 3: Bioenergy and Hydrogen - Bioconversion*

| variable_name | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|
| Biomass converted - BECCS-H2 | 0 | 0 | 0 | 181112.1 | 265263 | 317345.9 | 406847.3 |
| Biomass converted - Biopower | 10321.3 | 20110.4 | 59103.8 | 41822.2 | 35169.2 | 28143.9 | 185.79 |
| Biomass converted - Biopower w/ cc | 0 | 0 | 44936 | 49135.6 | 52999.4 | 86011.9 | 136462.8 |
| Biomass converted - ethanol | 129505.7 | 129505.9 | 129536.9 | 125006.1 | 67633.6 | 10261.1 | 905.319 |
| Biomass converted - FT diesel | 0 | 0 | 0 | 94.301 | 104.84 | 111.187 | 67.196 |
| Biomass converted - FT diesel w/ cc | 0 | 0 | 0 | 138.618 | 151.714 | 168.954 | 172.462 |
| Biomass converted - pyrolysis liquids | 0 | 0 | 0 | 204.84 | 227.262 | 231.978 | 9594.7 |
| Biomass converted - pyrolysis liquids w/ cc | 0 | 0 | 0 | 177.835 | 195.407 | 225.223 | 30115.2 |
| Biomass converted - SNG | 0 | 11.195 | 45.843 | 16.634 | 9.086 | 8.182 | 2.31 |
| Biomass converted - SNG w/ cc | 0 | 0 | 92.712 | 70.204 | 47.01 | 24.811 | 5.581 |

Table 52: *RE+ scenario - IMPACTS - Jobs*

| variable_name | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|
| Jobs by economic sector - agriculture | 30942 | 32312 | 43254.3 | 55699.3 | 47805.8 | 40069.1 | 47266.5 |
| Jobs by economic sector - construction | 513090.5 | 564240.2 | 617991.2 | 685586.1 | 719730 | 743266.2 | 850372.3 |
| Jobs by economic sector - manufacturing | 412451.2 | 588096.1 | 542488.6 | 535842.8 | 511626.1 | 442547.9 | 427853.7 |
| Jobs by economic sector - mining | 561513.8 | 462327.7 | 364056.7 | 291916.4 | 202221.7 | 144611.1 | 95195.7 |
| Jobs by economic sector - other | 46912.4 | 53013.6 | 58064.4 | 71028.4 | 84820.4 | 95569.2 | 129975 |
| Jobs by economic sector - pipeline | 45249.3 | 47529 | 56649.6 | 51074 | 38386.4 | 34708 | 36901.4 |
| Jobs by economic sector - professional | 295083.3 | 319609.3 | 332340.7 | 387337.4 | 432164 | 465444.4 | 539068.3 |
| Jobs by economic sector - trade | 310799.6 | 292297.8 | 275925.8 | 286155.5 | 286444.3 | 289099.6 | 322850.6 |
| Jobs by economic sector - utilities | 419027.4 | 476509.8 | 542229.2 | 654430.4 | 753102.5 | 848723.7 | 1023980 |
| Jobs by resource sector - Biomass | 82064.8 | 82054.2 | 103169.6 | 159818.4 | 159067.4 | 157610.2 | 200816.3 |
| Jobs by resource sector - CO2 | 0 | 8025.5 | 122977.6 | 106414 | 50282.2 | 76142.3 | 143767.9 |
| Jobs by resource sector - Coal | 155558.9 | 66513.3 | 18419.1 | 10824.6 | 9372.5 | 8418.2 | 6947.1 |
| Jobs by resource sector - Grid | 439818.4 | 528089.9 | 596159.2 | 831606.1 | 991543 | 1057735 | 1149332 |
| Jobs by resource sector - Natural Gas | 557103.3 | 579491.8 | 505648.7 | 449332 | 435552.6 | 364642 | 300788 |
| Jobs by resource sector - Nuclear | 50523.5 | 50230.7 | 60555.2 | 94101.2 | 139646.5 | 231042.1 | 377797 |
| Jobs by resource sector - Oil | 840194.6 | 790027.9 | 693931 | 596609.6 | 431475 | 326912.9 | 229513.9 |
| Jobs by resource sector - Solar | 401899 | 475723.2 | 444733.8 | 465379.5 | 485789.2 | 499764.2 | 691554.3 |
| Jobs by resource sector - Wind | 107906.8 | 255779 | 287406.4 | 304984.8 | 373572.8 | 381771.9 | 372947 |
| Median wages - Biomass | 50701 | 51665.9 | 53532 | 56878.6 | 59867.7 | 62772.1 | 64193.5 |
| Median wages - CO2 | 0 | 62403 | 62810.8 | 64256.2 | 66234.9 | 67172.9 | 66956 |
| Median wages - Coal | 57954.9 | 60716.6 | 58965.7 | 55632 | 56537.6 | 57488.9 | 58482.8 |
| Median wages - Grid | 61740.9 | 62539.4 | 63374.7 | 64247.5 | 65158.9 | 66110 | 67101.8 |
| Median wages - Natural Gas | 65534.4 | 66236.4 | 67054.6 | 67908.2 | 68518.6 | 69331.2 | 70036.2 |
| Median wages - Nuclear | 69863.4 | 71485.6 | 73188 | 74973.6 | 76845.7 | 78807.8 | 80863.5 |
| Median wages - Oil | 64938 | 65834.4 | 66719.8 | 67649.9 | 68455.6 | 69271.2 | 69967 |
| Median wages - Solar | 55157.4 | 55458.3 | 56358.7 | 57372.6 | 58435.8 | 59544.2 | 60748.8 |
| Median wages - Wind | 59205.2 | 58266.2 | 59962 | 61251.6 | 62474.8 | 64618.9 | 66554.4 |
| Required Level of Education - Associates degree or some college | 262141.4 | 160155.1 | 119891.4 | 176393.3 | 181251.8 | 186267.8 | 237329.6 |
| Required Level of Education - Bachelors degree | 190648.1 | 124049.4 | 101080.5 | 159775.3 | 174229 | 186457.3 | 238971.1 |
| Required Level of Education - Doctoral degree | 7240.651 | 5393.764 | 5034.951 | 8883.032 | 10380.108 | 11671.02 | 15120.892 |
| Required Level of Education - High school diploma or less | 525946.3 | 354068.9 | 335405.5 | 452103 | 416883.4 | 383147.3 | 470814.7 |
| Required Level of Education - Masters or professional degree | 46583.1 | 32656.5 | 28112.108 | 45234.868 | 50082.676 | 54180.748 | 69633.304 |
| Wage income - Biomass | 4160769900 | 4239400699 | 5522872688 | 9090248791 | 9523002583 | 9893520639 | 12891090889 |
| Wage income - CO2 | 0 | 500814527 | 7724315544 | 6837759201 | 3330436095 | 5114704316 | 9626132014 |
| Wage income - Coal | 9015402863 | 4038460305 | 1086092959 | 602192041 | 529896274 | 483953912 | 406286870 |
| Wage income - Grid | 27154768543 | 33026443091 | 37781398743 | 53428624279 | 64607880661 | 69926867581 | 77122221526 |
| Wage income - Natural Gas | 36509409831 | 38383459140 | 33906082577 | 30513321981 | 29843458231 | 25281056810 | 21066058815 |
| Wage income - Nuclear | 3529744599 | 3590769026 | 4431913611 | 7055106404 | 10731231355 | 18207905352 | 30549994736 |
| Wage income - Oil | 54560539668 | 52010989753 | 46298960513 | 40360603304 | 29536878406 | 22645657141 | 16058389925 |
| Wage income - Solar | 22167694950 | 26382801001 | 25064626854 | 26700020084 | 28387461839 | 29758074246 | 42011094352 |
| Wage income - Wind | 6388645664 | 14903275226 | 17233467628 | 18680821483 | 23338894405 | 24669695500 | 24821273242 |

Table 53: *RE+ scenario - PILLAR 6: Land carbon sinks - Agriculture*

| variable_name | 2050 |
|---|---|
| Carbon sink enhancement potential - Accelerate regeneration | 85600 |
| Carbon sink enhancement potential - All (not counting overlap) | 2556100 |
| Carbon sink enhancement potential - Avoid deforestation | 133000 |
| Carbon sink enhancement potential - corn-ethanol to energy grasses | -46572.044 |
| Carbon sink enhancement potential - cropland measures | -309933.22 |
| Carbon sink enhancement potential - Extend rotation length | 511000 |
| Carbon sink enhancement potential - Improve plantations | 99500 |
| Carbon sink enhancement potential - Increase retention of HWP | 5e+05 |
| Carbon sink enhancement potential - Increase trees outside forests | 100500 |
| Carbon sink enhancement potential - permanent conservation cover | -11086.983 |
| Carbon sink enhancement potential - Reforest cropland | 423500 |
| Carbon sink enhancement potential - Reforest pasture | 406000 |
| Carbon sink enhancement potential - Restore productivity | 297000 |
| Carbon sink enhancement potential - total | -367592.247 |
| Land impacted for carbon sink enhancement - Accelerate regeneration | 34500 |
| Land impacted for carbon sink enhancement - All (not counting overlap) | 505500 |
| Land impacted for carbon sink enhancement - Avoid deforestation | 35702 |
| Land impacted for carbon sink enhancement - corn-ethanol to energy grasses | 22574.8 |
| Land impacted for carbon sink enhancement - cropland measures | 207795.4 |
| Land impacted for carbon sink enhancement - Extend rotation length | 281500 |
| Land impacted for carbon sink enhancement - Improve plantations | 55300 |
| Land impacted for carbon sink enhancement - Increase retention of HWP | 1e+05 |
| Land impacted for carbon sink enhancement - Increase trees outside forests | 28350 |
| Land impacted for carbon sink enhancement - permanent conservation cover | 19123.8 |
| Land impacted for carbon sink enhancement - Reforest cropland | 141000 |
| Land impacted for carbon sink enhancement - Reforest pasture | 30700 |
| Land impacted for carbon sink enhancement - Restore productivity | 167600 |
| Land impacted for carbon sink enhancement - total | 249494 |
| Land impacted for carbon sink enhancement - Total impacted (over 30 years) | 369152 |

Table 54: *RE+ scenario - PILLAR 6: Land carbon sinks - Forests*

| variable_name | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|
| Business-as-usual carbon sink - Accelerate regeneration | 0 | 0 | 0 | 0 | 0 | 0 | 8000 |
| Business-as-usual carbon sink - Avoid deforestation | 0 | 0 | 0 | 0 | 0 | 0 | 11373 |
| Business-as-usual carbon sink - Extend rotation length | 0 | 0 | 0 | 0 | 0 | 0 | 154000 |
| Business-as-usual carbon sink - Improve plantations | 0 | 0 | 0 | 0 | 0 | 0 | 21000 |
| Business-as-usual carbon sink - Increase retention of HWP | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Business-as-usual carbon sink - Increase trees outside forests | 0 | 0 | 0 | 0 | 0 | 0 | 5700 |
| Business-as-usual carbon sink - Reforest cropland | 0 | 0 | 0 | 0 | 0 | 0 | 16000 |
| Business-as-usual carbon sink - Reforest pasture | 0 | 0 | 0 | 0 | 0 | 0 | 7500 |
| Business-as-usual carbon sink - Restore productivity | 0 | 0 | 0 | 0 | 0 | 0 | 59000 |
| Business-as-usual carbon sink - Total impacted (over 30 years) | 0 | 0 | 0 | 0 | 0 | 0 | 16000 |
| Carbon sink enhancement potential | -0.7 | -0.73 | -0.75 | -0.78 | -0.8 | -0.83 | -0.85 |

Table 55: *RE+ scenario - IMPACTS - Fossil fuel industries*

| variable_name | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|
| Natural gas consumption | 23031616 | 24131259 | 21290522 | 20400393 | 18525419 | 15158713 | 12530695 |
| Oil consumption | 6207882 | 5922428 | 5196427 | 4118738 | 3106056 | 2383748 | 1929723 |

Table 56: *B+ scenario - PILLAR 2: Clean Electricity - Generating capacity*

| variable_name | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|
| Power generation capital investment - biomass power plant | 0 | 0.001 | 0.009 | 0 | 0.004 | 0 | 0.001 |
| Power generation capital investment - biomass w/ccu allam power plant | 0 | 0 | 0 | 0.472 | 0.167 | 0.105 | 0.397 |
| Power generation capital investment - biomass w/ccu power plant | 0 | 0 | 66.047 | 88.896 | 161.947 | 86.984 | 36.039 |

Table 57: *B+ scenario - PILLAR 2: Clean Electricity - Generation*

| variable_name | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|
| Power generation by technology - biomass power plant | 3556.6 | 827.269 | 10411.1 | 3819.3 | 2255.7 | 1124.4 | 63.577 |
| Power generation by technology - biomass w/ccu allam power plant | 0 | 0 | 0 | 394.245 | 482.896 | 569.012 | 954.924 |

Table 57: *B+ scenario - PILLAR 2: Clean Electricity - Generation (continued)*

| variable_name | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|
| Power generation by technology - biomass w/ccu power plant | 0 | 0 | 74108 | 173714.6 | 355539.1 | 453084.3 | 491647.1 |

Table 58: *B+ scenario - PILLAR 3: Bioenergy and Hydrogen - Bioconversion*

| variable_name | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|
| Biomass converted - BECCS-H2 | 0 | 0 | 0 | 161321.7 | 336107.9 | 552980.2 | 641173.4 |
| Biomass converted - Biopower | 10249.3 | 24177.4 | 56258.2 | 40449.8 | 30444.2 | 12725 | 635.615 |
| Biomass converted - Biopower w/ cc | 0 | 0 | 44764.6 | 105109.5 | 214979.8 | 273940.4 | 297408.2 |
| Biomass converted - ethanol | 129505.9 | 129505.9 | 129536.5 | 125006.1 | 67633.6 | 10261.1 | 905.319 |
| Biomass converted - FT diesel | 0 | 0 | 0 | 107.113 | 122.295 | 124.217 | 99.136 |
| Biomass converted - FT diesel w/ cc | 0 | 0 | 0 | 150.857 | 192.145 | 226.537 | 278.591 |
| Biomass converted - pyrolysis liquids | 0 | 0 | 0 | 211.841 | 315.899 | 1714 | 123715.3 |
| Biomass converted - pyrolysis liquids w/ cc | 0 | 0 | 0 | 158.244 | 219.493 | 298.958 | 56876.1 |
| Biomass converted - SNG | 0 | 9.942 | 18.532 | 8.406 | 8.228 | 7.312 | 3.446 |
| Biomass converted - SNG w/ cc | 0 | 0 | 38.509 | 22.493 | 15.382 | 14.466 | 11.93 |
| Biomass purchases | 0 | 0.762 | 6.853 | 28.667 | 56.896 | 84.568 | 113.753 |
| Capital investment | 0 | 0 | 62.288 | 0 | 589.187 | 0 | 692.653 |
| Number of facilities - allam power w ccu | 0 | 0 | 0 | 14 | 24 | 33 | 42 |
| Number of facilities - beccs hydrogen | 0 | 0 | 0 | 217 | 453 | 742 | 858 |
| Number of facilities - diesel | 0 | 0 | 0 | 14 | 16 | 18 | 20 |
| Number of facilities - diesel ccu | 0 | 0 | 0 | 14 | 24 | 35 | 39 |
| Number of facilities - power | 0 | 12 | 16 | 16 | 17 | 17 | 17 |
| Number of facilities - power ccu | 0 | 0 | 67 | 148 | 296 | 379 | 413 |
| Number of facilities - pyrolysis | 0 | 0 | 0 | 14 | 16 | 19 | 178 |
| Number of facilities - pyrolysis ccu | 0 | 0 | 0 | 14 | 24 | 35 | 119 |
| Number of facilities - sng | 0 | 14 | 15 | 15 | 15 | 16 | 17 |
| Number of facilities - sng ccu | 0 | 0 | 14 | 14 | 14 | 16 | 19 |

Table 59: *B+ scenario - PILLAR 4: CO2 capture, use, storage - CO2 capture*

| variable_name | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|
| Annual - All | 0 | 89.65 | 474.84 | 953.83 | 1408.6 | 1659.3 |
| Annual - BECCS | 0 | 73.4 | 415.18 | 858.19 | 1281.1 | 1505.9 |
| Annual - Cement | 0 | 16.2 | 50.27 | 82.99 | 109.45 | 123.65 |
| Annual - NGCC | 0 | 0.07 | 9.41 | 12.69 | 18.09 | 29.72 |
| Cumulative - All | 0 | 89.65 | 564.49 | 1518.3 | 2926.9 | 4586.3 |
| Cumulative - BECCS | 0 | 73.4 | 488.58 | 1346.8 | 2627.9 | 4133.8 |
| Cumulative - Cement | 0 | 16.2 | 66.47 | 149.46 | 258.91 | 382.56 |
| Cumulative - NGCC | 0 | 0.07 | 9.48 | 22.17 | 40.26 | 69.98 |

Table 60: *B+ scenario - PILLAR 4: CO2 capture, use, storage - CO2 storage*

| variable_name | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|
| Annual | 0 | 98.8 | 477.31 | 941.03 | 1281.2 | 1361 |
| Injection wells | 0 | 124 | 553 | 966 | 1582 | 1993 |
| Resource characterization, appraisal and permitting costs cumulative | 1500 | 12421.3 | 19309.8 | 19309.8 | 19309.8 | 19309.8 |
| Wells and facilities construction costs cumulative | 0 | 3766.2 | 16623.1 | 29043.5 | 47564.5 | 59759.4 |

Table 61: *B+ scenario - PILLAR 4: CO2 capture, use, storage - CO2 transportation*

| variable_name | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|
| CO2 pipelines - All | 3706707.577 | 73948433.9 | 133946331 | 180875713.3 | 209202931.7 | 224670928.5 |
| CO2 pipelines - Spur | 0 | 5270263.8 | 24284617.9 | 46301287.2 | 73254505.6 | 88722502.4 |
| CO2 pipelines - Trunk | 3706707.577 | 68678170.1 | 109661713.1 | 134574426.1 | 135948426.1 | 135948426.1 |

Table 62: *B+ scenario - IMPACTS - Jobs*

| variable_name | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|
| Jobs by economic sector - agriculture | 30833.5 | 32173.8 | 42288.3 | 59071.1 | 62967.5 | 64464.2 | 78944.4 |
| Jobs by economic sector - construction | 518697.3 | 581252.5 | 743825.6 | 811794.8 | 829965.9 | 994703.1 | 1303457 |
| Jobs by economic sector - manufacturing | 427454.7 | 645629.2 | 844955.7 | 761042.8 | 623120.7 | 736461.2 | 965790.4 |
| Jobs by economic sector - mining | 560516 | 457821.7 | 349136.2 | 269459.3 | 206373.9 | 156951.8 | 92009.8 |
| Jobs by economic sector - other | 47713.7 | 56622.3 | 81960.3 | 98073.3 | 110779.4 | 143436.8 | 220992.8 |
| Jobs by economic sector - pipeline | 45106 | 46237.6 | 52376.8 | 44732.3 | 34805.9 | 32366 | 31957.6 |
| Jobs by economic sector - professional | 297849 | 330225.4 | 397849.4 | 470431.6 | 536936.2 | 663638.2 | 863741.1 |
| Jobs by economic sector - trade | 312163.1 | 298942.2 | 314041.8 | 335172.3 | 352941.1 | 407909.1 | 513327.5 |
| Jobs by economic sector - utilities | 420669.2 | 468318.2 | 554761.1 | 621121.5 | 646603.8 | 823091.4 | 1082332 |
| Jobs by resource sector - Biomass | 82200.9 | 84135.4 | 102666 | 169933.4 | 238222.4 | 297448.4 | 376673.1 |
| Jobs by resource sector - CO2 | 0 | 7355.5 | 110939 | 96103.6 | 46427.8 | 69904.5 | 129825.2 |
| Jobs by resource sector - Coal | 155416.5 | 70410.9 | 19425.8 | 10920.5 | 9513.9 | 8525.3 | 7486.1 |
| Jobs by resource sector - Grid | 443595.3 | 525062 | 692164.5 | 892243.7 | 1008997 | 1382106 | 1863359 |
| Jobs by resource sector - Natural Gas | 554397.4 | 549721.2 | 413742.2 | 308646.2 | 265701.6 | 210383.3 | 156960.7 |
| Jobs by resource sector - Nuclear | 50520.6 | 50072.3 | 48499.5 | 48680.2 | 37109.2 | 33815.6 | 44063.8 |
| Jobs by resource sector - Oil | 840198.5 | 792898.8 | 708136.2 | 634032.1 | 560852.7 | 477059 | 296730.7 |
| Jobs by resource sector - Solar | 414003.1 | 531354.9 | 758461.7 | 723888 | 684433.9 | 830200.8 | 1308693 |
| Jobs by resource sector - Wind | 120670 | 306211.8 | 527160.2 | 586451.5 | 553235.3 | 713579.3 | 968761.5 |
| Median wages - Biomass | 50732.4 | 51941.4 | 53607.6 | 57044.4 | 60729.5 | 63277.2 | 64543.8 |
| Median wages - CO2 | 0 | 62479.1 | 62742.3 | 64197.3 | 66394.9 | 67286.9 | 66878.8 |
| Median wages - Coal | 57958.7 | 60506.3 | 59389.3 | 55630.1 | 56523.8 | 57467.9 | 58461.3 |
| Median wages - Grid | 61740.9 | 62539.4 | 63374.7 | 64247.5 | 65158.9 | 66110 | 67101.8 |
| Median wages - Natural Gas | 65533.8 | 66255.4 | 67114.7 | 67810.9 | 68307.6 | 69006.4 | 69777.3 |
| Median wages - Nuclear | 69863.4 | 71485.6 | 73188 | 74973.6 | 76845.7 | 78807.8 | 80863.5 |
| Median wages - Oil | 64938 | 65827.5 | 66678.3 | 67513 | 68322.3 | 69193.5 | 69923.7 |
| Median wages - Solar | 55128.8 | 55403.6 | 56084.8 | 57168.5 | 58323.4 | 59247.9 | 60235.7 |
| Median wages - Wind | 58848.6 | 58080.4 | 59100.4 | 60914.1 | 63240.8 | 64158 | 65103.7 |
| Required Level of Education - Associates degree or some college | 262200 | 167118 | 121181 | 186995.4 | 272527.6 | 349471.1 | 443152 |

Table 62: *B+ scenario - IMPACTS - Jobs (continued)*

| variable_name | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|
| Required Level of Education - Bachelors degree | 190920 | 130385.1 | 102631.7 | 170660.3 | 271871.2 | 362314 | 458982.9 |
| Required Level of Education - Doctoral degree | 7261.15 | 5697.631 | 5117.008 | 9573.192 | 16589.088 | 22934.952 | 29262.868 |
| Required Level of Education - High school diploma or less | 525629.7 | 364894.9 | 333600.1 | 477700 | 589978.8 | 681607.8 | 848370.6 |
| Required Level of Education - Masters or professional degree | 46659.1 | 34224.7 | 28502.852 | 48420.088 | 78200.852 | 105015.428 | 133541.5 |
| Wage income - Biomass | 4170247915 | 4370111334 | 5503685499 | 9693751914 | 14467119168 | 18821703783 | 24311913445 |
| Wage income - CO2 | 0 | 459568359 | 6960573433 | 6169587440 | 3082570333 | 4703657315 | 8682554451 |
| Wage income - Coal | 9007746177 | 4260301119 | 1153681785 | 607510977 | 537761070 | 489932944 | 437649396 |
| Wage income - Grid | 27387960875 | 32837077094 | 43865703126 | 57324442231 | 65745187768 | 91370972880 | 125034712862 |
| Wage income - Natural Gas | 36331774632 | 36422016270 | 27768182139 | 20929579162 | 18149442205 | 14517790685 | 10952299747 |
| Wage income - Nuclear | 3529541210 | 3579447924 | 3549577521 | 3649726415 | 2851683009 | 2664928698 | 3563152835 |
| Wage income - Oil | 54560786779 | 52194585875 | 47217291320 | 42805376703 | 38318762199 | 33009384983 | 20748513022 |
| Wage income - Solar | 22823513808 | 29438950555 | 42538148735 | 41383557035 | 39918495153 | 49187679411 | 78830053076 |
| Wage income - Wind | 7101257665 | 17784894768 | 31155394103 | 35723142926 | 34987020776 | 45781841886 | 63069976734 |

Table 63: *B+ scenario - PILLAR 6: Land carbon sinks - Agriculture*

| variable_name | 2050 |
|---|---|
| Carbon sink enhancement potential - Accelerate regeneration | 85600 |
| Carbon sink enhancement potential - All (not counting overlap) | 2556100 |
| Carbon sink enhancement potential - Avoid deforestation | 133000 |
| Carbon sink enhancement potential - corn-ethanol to energy grasses | -77751.95 |
| Carbon sink enhancement potential - cropland measures | -287480.876 |
| Carbon sink enhancement potential - Cropland to woody energy crops | 0 |
| Carbon sink enhancement potential - Extend rotation length | 511000 |
| Carbon sink enhancement potential - Improve plantations | 99500 |
| Carbon sink enhancement potential - Increase retention of HWP | 5e+05 |
| Carbon sink enhancement potential - Increase trees outside forests | 100500 |
| Carbon sink enhancement potential - pasture to energy crops | 0 |
| Carbon sink enhancement potential - permanent conservation cover | -10191.636 |
| Carbon sink enhancement potential - Reforest cropland | 423500 |
| Carbon sink enhancement potential - Reforest pasture | 406000 |
| Carbon sink enhancement potential - Restore productivity | 297000 |
| Carbon sink enhancement potential - total | -375424.464 |
| Land impacted for carbon sink enhancement - Accelerate regeneration | 34500 |
| Land impacted for carbon sink enhancement - All (not counting overlap) | 505500 |
| Land impacted for carbon sink enhancement - Avoid deforestation | 35702 |
| Land impacted for carbon sink enhancement - corn-ethanol to energy grasses | 42275.4 |
| Land impacted for carbon sink enhancement - cropland measures | 380164 |
| Land impacted for carbon sink enhancement - Cropland to woody energy crops | 8173.2 |
| Land impacted for carbon sink enhancement - Extend rotation length | 281500 |
| Land impacted for carbon sink enhancement - Improve plantations | 55300 |
| Land impacted for carbon sink enhancement - Increase retention of HWP | 1e+05 |
| Land impacted for carbon sink enhancement - Increase trees outside forests | 28350 |
| Land impacted for carbon sink enhancement - pasture to energy crops | 29553.8 |
| Land impacted for carbon sink enhancement - permanent conservation cover | 17565 |
| Land impacted for carbon sink enhancement - Reforest cropland | 141000 |
| Land impacted for carbon sink enhancement - Reforest pasture | 30700 |
| Land impacted for carbon sink enhancement - Restore productivity | 167600 |
| Land impacted for carbon sink enhancement - total | 477731.4 |
| Land impacted for carbon sink enhancement - Total impacted (over 30 years) | 369152 |

Table 64: *B+ scenario - PILLAR 6: Land carbon sinks - Forests*

| variable_name | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|
| Business-as-usual carbon sink - Accelerate regeneration | 0 | 0 | 0 | 0 | 0 | 0 | 8000 |
| Business-as-usual carbon sink - Avoid deforestation | 0 | 0 | 0 | 0 | 0 | 0 | 11373 |
| Business-as-usual carbon sink - Extend rotation length | 0 | 0 | 0 | 0 | 0 | 0 | 154000 |
| Business-as-usual carbon sink - Improve plantations | 0 | 0 | 0 | 0 | 0 | 0 | 21000 |
| Business-as-usual carbon sink - Increase retention of HWP | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Business-as-usual carbon sink - Increase trees outside forests | 0 | 0 | 0 | 0 | 0 | 0 | 5700 |
| Business-as-usual carbon sink - Reforest cropland | 0 | 0 | 0 | 0 | 0 | 0 | 16000 |
| Business-as-usual carbon sink - Reforest pasture | 0 | 0 | 0 | 0 | 0 | 0 | 7500 |
| Business-as-usual carbon sink - Restore productivity | 0 | 0 | 0 | 0 | 0 | 0 | 59000 |
| Business-as-usual carbon sink - Total impacted (over 30 years) | 0 | 0 | 0 | 0 | 0 | 0 | 16000 |
| Carbon sink enhancement potential | -0.7 | -0.73 | -0.75 | -0.78 | -0.8 | -0.83 | -0.85 |

Table 65: *B+ scenario - IMPACTS - Fossil fuel industries*

| variable_name | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|
| Natural gas consumption | 22898307 | 22870246 | 18067361 | 14168497 | 11670922 | 9024106 | 6934881 |
| Oil consumption | 6207962 | 5987007 | 5544637 | 5112346 | 4688102 | 3809797 | 2612273 |