



Net-Zero America - South Carolina data

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See the [Data Sheet Guide](#) for explanations of the contents of this document. The data herein underlie graphs and tables found in Princeton's Net-Zero America report:

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Table 1: *E+ scenario - IMPACTS - Health*

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|------|-------|-------|-------|-------|-------|-------|
| Premature deaths from air pollution - Fuel Comb - Electric Generation - Coal (deaths) | | 30.4 | 0.049 | 0.046 | 0.036 | 0.025 | 0.002 |
| Premature deaths from air pollution - Fuel Comb - Electric Generation - Natural Gas (deaths) | | 21 | 16.7 | 9.98 | 7.89 | 3.95 | 1.45 |
| Premature deaths from air pollution - Mobile - On-Road (deaths) | | 117 | 110 | 84.4 | 49.2 | 22.6 | 8.97 |
| Premature deaths from air pollution - Gas Stations (deaths) | | 15.4 | 14.2 | 10.8 | 6.43 | 3.13 | 1.47 |
| Premature deaths from air pollution - Fuel Comb - Residential - Natural Gas (deaths) | | 10.2 | 8.38 | 5.66 | 3.2 | 1.61 | 0.781 |
| Premature deaths from air pollution - Fuel Comb - Residential - Oil (deaths) | | 1.82 | 1.48 | 1.02 | 0.612 | 0.302 | 0.135 |
| Premature deaths from air pollution - Fuel Comb - Residential - Other (deaths) | | 2.11 | 1.9 | 1.49 | 1.02 | 0.602 | 0.339 |
| Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Coal (deaths) | | 1.58 | 1.52 | 1.46 | 1.4 | 1.33 | 1.25 |
| Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Natural Gas (deaths) | | 8.36 | 7.38 | 5.45 | 3.45 | 2.12 | 1.38 |
| Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Oil (deaths) | | 1.5 | 1.25 | 0.971 | 0.698 | 0.486 | 0.321 |
| Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Other (deaths) | | 1.47 | 1.27 | 1.06 | 0.843 | 0.63 | 0.422 |
| Premature deaths from air pollution - Industrial Processes - Coal Mining (deaths) | | 0.615 | 0.317 | 0.317 | 0.315 | 0.322 | 0.321 |
| Premature deaths from air pollution - Industrial Processes - Oil & Gas Production (deaths) | | 24.7 | 23.3 | 21.2 | 16.7 | 12.4 | 7.71 |
| Monetary damages from air pollution - Fuel Comb - Electric Generation - Coal (million \$2019) | | 269 | 0.437 | 0.407 | 0.323 | 0.225 | 0.019 |
| Monetary damages from air pollution - Fuel Comb - Electric Generation - Natural Gas (million \$2019) | | 186 | 148 | 88.4 | 69.9 | 35 | 12.9 |
| Monetary damages from air pollution - Mobile - On-Road (million \$2019) | | 1,041 | 979 | 750 | 437 | 201 | 79.7 |
| Monetary damages from air pollution - Gas Stations (million \$2019) | | 136 | 126 | 95.5 | 56.9 | 27.7 | 13 |
| Monetary damages from air pollution - Fuel Comb - Residential - Natural Gas (million \$2019) | | 90.7 | 74.2 | 50.2 | 28.3 | 14.3 | 6.92 |
| Monetary damages from air pollution - Fuel Comb - Residential - Oil (million \$2019) | | 16.1 | 13.1 | 9.05 | 5.43 | 2.68 | 1.2 |
| Monetary damages from air pollution - Fuel Comb - Residential - Other (million \$2019) | | 18.7 | 16.9 | 13.2 | 9.03 | 5.33 | 3.01 |
| Monetary damages from air pollution - Fuel Comb - Comm/Institutional - Coal (million \$2019) | | 14 | 13.5 | 12.9 | 12.4 | 11.7 | 11 |
| Monetary damages from air pollution - Fuel Comb - Comm/Institutional - Natural Gas (million \$2019) | | 74 | 65.3 | 48.2 | 30.5 | 18.8 | 12.2 |

Table 1: *E+ scenario - IMPACTS - Health (continued)*

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|------|------|------|------|------|------|------|
| Monetary damages from air pollution - Fuel Comb - Comm/Institutional - Oil (million \$2019) | | 13.3 | 11.1 | 8.59 | 6.18 | 4.31 | 2.84 |
| Monetary damages from air pollution - Fuel Comb - Comm/Institutional - Other (million \$2019) | | 13 | 11.2 | 9.36 | 7.46 | 5.58 | 3.74 |
| Monetary damages from air pollution - Industrial Processes - Coal Mining (million \$2019) | | 5.43 | 2.79 | 2.8 | 2.78 | 2.84 | 2.84 |
| Monetary damages from air pollution - Industrial Processes - Oil & Gas Production (million \$2019) | | 220 | 207 | 189 | 148 | 110 | 68.5 |

Table 2: *E+ scenario - IMPACTS - Jobs*

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|------|--------|--------|--------|--------|--------|--------|
| By economic sector - Agriculture (jobs) | | 182 | 370 | 141 | 326 | 739 | 941 |
| By economic sector - Construction (jobs) | | 4,994 | 29,745 | 22,611 | 25,601 | 25,964 | 26,553 |
| By economic sector - Manufacturing (jobs) | | 3,012 | 5,520 | 5,709 | 5,529 | 6,590 | 6,345 |
| By economic sector - Mining (jobs) | | 1,727 | 1,235 | 795 | 478 | 270 | 148 |
| By economic sector - Other (jobs) | | 444 | 5,801 | 4,138 | 5,127 | 5,206 | 6,122 |
| By economic sector - Pipeline (jobs) | | 367 | 312 | 360 | 238 | 227 | 224 |
| By economic sector - Professional (jobs) | | 2,907 | 11,791 | 9,166 | 11,012 | 11,907 | 12,958 |
| By economic sector - Trade (jobs) | | 2,029 | 7,900 | 6,122 | 7,322 | 7,713 | 8,622 |
| By economic sector - Utilities (jobs) | | 7,470 | 14,248 | 17,105 | 20,038 | 22,754 | 21,229 |
| By resource sector - Biomass (jobs) | | 782 | 1,020 | 403 | 980 | 2,696 | 4,019 |
| By resource sector - CO2 (jobs) | | 1.58 | 3.49 | 961 | 497 | 937 | 1,235 |
| By resource sector - Coal (jobs) | | 744 | 0 | 0 | 0 | 0 | 0 |
| By resource sector - Grid (jobs) | | 7,528 | 21,593 | 27,711 | 34,081 | 40,864 | 39,031 |
| By resource sector - Natural Gas (jobs) | | 3,626 | 3,404 | 2,868 | 2,985 | 2,134 | 1,229 |
| By resource sector - Nuclear (jobs) | | 2,635 | 2,593 | 2,552 | 2,512 | 2,126 | 1,604 |
| By resource sector - Oil (jobs) | | 4,311 | 3,403 | 2,397 | 1,583 | 1,006 | 605 |
| By resource sector - Solar (jobs) | | 3,490 | 44,695 | 29,093 | 32,489 | 30,224 | 34,635 |
| By resource sector - Wind (jobs) | | 14.7 | 211 | 163 | 543 | 1,383 | 783 |
| By education level - All sectors - High school diploma or less (jobs) | | 9,498 | 33,327 | 28,392 | 32,414 | 34,896 | 35,627 |
| By education level - All sectors - Associates degree or some college (jobs) | | 7,133 | 24,566 | 21,342 | 24,465 | 26,256 | 26,755 |
| By education level - All sectors - Bachelors degree (jobs) | | 5,082 | 14,733 | 12,759 | 14,563 | 15,670 | 16,043 |
| By education level - All sectors - Masters or professional degree (jobs) | | 1,244 | 3,705 | 3,188 | 3,685 | 3,975 | 4,106 |
| By education level - All sectors - Doctoral degree (jobs) | | 175 | 590 | 466 | 542 | 574 | 610 |
| Related work experience - All sectors - None (jobs) | | 3,310 | 11,215 | 9,683 | 11,121 | 11,997 | 12,287 |
| Related work experience - All sectors - Up to 1 year (jobs) | | 4,483 | 16,105 | 13,509 | 15,451 | 16,616 | 17,117 |
| Related work experience - All sectors - 1 to 4 years (jobs) | | 8,428 | 27,336 | 23,629 | 27,051 | 29,107 | 29,710 |
| Related work experience - All sectors - 4 to 10 years (jobs) | | 5,443 | 17,738 | 15,362 | 17,545 | 18,811 | 19,129 |
| Related work experience - All sectors - Over 10 years (jobs) | | 1,468 | 4,527 | 3,965 | 4,501 | 4,840 | 4,899 |
| On-the-Job Training - All sectors - None (jobs) | | 1,276 | 4,377 | 3,643 | 4,167 | 4,434 | 4,592 |
| On-the-Job Training - All sectors - Up to 1 year (jobs) | | 15,329 | 49,561 | 42,688 | 48,832 | 52,752 | 54,029 |

Table 2: *E+ scenario - IMPACTS - Jobs (continued)*

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|------|--------|--------|--------|--------|--------|--------|
| On-the-Job Training - All sectors - 1 to 4 years (jobs) | | 4,824 | 16,491 | 14,310 | 16,358 | 17,502 | 17,733 |
| On-the-Job Training - All sectors - 4 to 10 years (jobs) | | 1,485 | 5,699 | 4,858 | 5,589 | 5,928 | 6,018 |
| On-the-Job Training - All sectors - Over 10 years (jobs) | | 218 | 793 | 648 | 724 | 756 | 770 |
| On-Site or In-Plant Training - All sectors - None (jobs) | | 3,752 | 12,688 | 10,722 | 12,257 | 13,121 | 13,482 |
| On-Site or In-Plant Training - All sectors - Up to 1 year (jobs) | | 13,908 | 45,130 | 38,931 | 44,533 | 48,075 | 49,191 |
| On-Site or In-Plant Training - All sectors - 1 to 4 years (jobs) | | 3,739 | 12,773 | 11,066 | 12,650 | 13,550 | 13,748 |
| On-Site or In-Plant Training - All sectors - 4 to 10 years (jobs) | | 1,543 | 5,658 | 4,837 | 5,550 | 5,892 | 5,975 |
| On-Site or In-Plant Training - All sectors - Over 10 years (jobs) | | 189 | 672 | 591 | 681 | 734 | 745 |
| Wage income - All (million \$2019) | | 1,208 | 3,771 | 3,330 | 3,854 | 4,209 | 4,336 |

Table 3: *E+ scenario - IMPACTS - Fossil fuel industries*

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|------|------|------|------|------|------|-------|
| Oil consumption - Annual (million bbls) | | 97 | 83.4 | 63.6 | 45.3 | 30.8 | 19.7 |
| Oil consumption - Cumulative (million bbls) | | | | | | | 1,969 |
| Oil production - Annual (million bbls) | | 0 | 0 | 0 | 0 | 0 | 0 |
| Natural gas consumption - Annual (tcf) | | 254 | 214 | 172 | 129 | 81.4 | 56.4 |
| Natural gas consumption - Cumulative (tcf) | | | | | | | 5,174 |
| Natural gas production - Annual (tcf) | | 0 | 0 | 0 | 0 | 0 | 0 |

Table 4: *E+ scenario - PILLAR 1: Efficiency/Electrification - Overview*

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|------|------|------|------|------|------|------|
| Final energy use - Transportation (PJ) | 463 | 438 | 386 | 323 | 267 | 233 | 218 |
| Final energy use - Residential (PJ) | 158 | 150 | 141 | 129 | 119 | 115 | 113 |
| Final energy use - Commercial (PJ) | 114 | 114 | 111 | 106 | 101 | 100 | 102 |
| Final energy use - Industry (PJ) | 358 | 374 | 380 | 387 | 398 | 399 | 404 |

Table 5: *E+ scenario - PILLAR 1: Efficiency/Electrification - Electricity demand*

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|------|------|------|------|------|------|------|
| Electricity distribution capital invested - Cumulative 5-yr (billion \$2018) | | 3.55 | 3.63 | 5.67 | 5.98 | 4.97 | 5.12 |

Table 6: *E+ scenario - PILLAR 1: Efficiency/Electrification - Transportation*

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|-------|-------|-------|-------|-------|-------|-------|
| Vehicle stocks - LDV – EV (1000 units) | 17.4 | 382 | 746 | 2,022 | 3,298 | 4,317 | 5,336 |
| Vehicle stocks - LDV – All others (1000 units) | 4,450 | 4,237 | 4,024 | 2,933 | 1,841 | 1,042 | 242 |
| Light-duty vehicle capital costs vs. REF - Cumulative 5-yr (million \$2018) | | 856 | 2,191 | 3,557 | 5,385 | 5,864 | 5,589 |
| Public EV charging plugs - DC Fast (1000 units) | 0.1 | | 1.63 | | 7.19 | | 11.6 |
| Public EV charging plugs - L2 (1000 units) | 0.476 | | 39.1 | | 173 | | 280 |

Table 7: *E+ scenario - PILLAR 1: Efficiency/Electrification - Residential*

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|------|------|------|-------|------|------|------|
| Sales of space heating units - Electric Heat Pump (%) | 37.5 | 51.9 | 80.7 | 87.2 | 87.5 | 87.4 | 87.4 |
| Sales of space heating units - Electric Resistance (%) | 25.8 | 25.3 | 10.7 | 7.34 | 7.15 | 7.29 | 7.33 |
| Sales of space heating units - Gas (%) | 30.5 | 15 | 4.16 | 1.77 | 1.69 | 1.69 | 1.68 |
| Sales of space heating units - Fossil (%) | 6.1 | 7.81 | 4.43 | 3.7 | 3.67 | 3.6 | 3.59 |
| Sales of water heating units - Electric Heat Pump (%) | 0 | 12.1 | 64.1 | 75.7 | 76.2 | 76.2 | 76.1 |
| Sales of water heating units - Electric Resistance (%) | 67.7 | 70.5 | 30.6 | 21.7 | 21.3 | 21.3 | 21.3 |
| Sales of water heating units - Gas Furnace (%) | 28.2 | 14.7 | 2.78 | 0.118 | 0 | 0 | 0 |
| Sales of water heating units - Other (%) | 4.1 | 2.65 | 2.54 | 2.53 | 2.55 | 2.56 | 2.57 |
| Sales of cooking units - Electric Resistance (%) | 82.7 | 86.4 | 97.7 | 99.9 | 100 | 100 | 100 |
| Sales of cooking units - Gas (%) | 17.3 | 13.6 | 2.33 | 0.117 | 0 | 0 | 0 |
| Residential HVAC investment in 2020s vs. REF - Cumulative 5-yr (billion \$2018) | | 3.83 | 4.21 | | | | |

Table 8: *E+ scenario - PILLAR 1: Efficiency/Electrification - Commercial*

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|-------|--------|--------|-------|------|------|------|
| Sales of space heating units - Electric Heat Pump (%) | 10.1 | 27.5 | 70.6 | 83.9 | 85.2 | 85.2 | 85.2 |
| Sales of space heating units - Electric Resistance (%) | 9.29 | 8.33 | 10.3 | 12.4 | 12.9 | 12.8 | 12.8 |
| Sales of space heating units - Gas (%) | 78.5 | 60.3 | 18.3 | 3.66 | 1.98 | 1.94 | 1.94 |
| Sales of space heating units - Fossil (%) | 2.15 | 3.92 | 0.743 | 0.032 | 0 | 0 | 0 |
| Sales of water heating units - Electric Heat Pump (%) | 0.316 | 10.5 | 54.5 | 64.3 | 64.7 | 64.8 | 64.8 |
| Sales of water heating units - Electric Resistance (%) | 7.81 | 11 | 28.4 | 32.3 | 32.5 | 32.5 | 32.5 |
| Sales of water heating units - Gas (%) | 88 | 74.5 | 14.1 | 0.593 | 0 | 0 | 0 |
| Sales of water heating units - Other (%) | 3.86 | 4.03 | 2.99 | 2.74 | 2.74 | 2.73 | 2.73 |
| Sales of cooking units - Electric Resistance (%) | 32 | 46 | 79.9 | 86.5 | 86.9 | 86.9 | 86.9 |
| Sales of cooking units - Gas (%) | 68 | 54 | 20.1 | 13.5 | 13.1 | 13.1 | 13.1 |
| Commercial HVAC investment in 2020s - Cumulative 5-yr (million \$2018) | | 15,755 | 17,550 | | | | |

Table 9: *E+ scenario - PILLAR 2: Clean Electricity - Generating capacity*

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|-------|-------|--------|--------|--------|--------|--------|
| Installed thermal - Coal (MW) | 5,499 | 0 | 0 | 0 | 0 | 0 | 0 |
| Installed thermal - Natural gas (MW) | 6,450 | 8,600 | 11,247 | 11,752 | 9,484 | 6,600 | 6,693 |
| Installed thermal - Nuclear (MW) | 5,220 | 5,220 | 5,220 | 5,220 | 5,220 | 3,440 | 3,440 |
| Installed renewables - Rooftop PV (MW) | 353 | 569 | 805 | 1,146 | 1,626 | 2,248 | 3,044 |
| Installed renewables - Solar - Base land use assumptions (MW) | 1,471 | 1,471 | 31,120 | 43,975 | 57,724 | 67,821 | 78,649 |
| Installed renewables - Offshore Wind - Base land use assumptions (MW) | 0 | 0 | 0 | 0 | 2,121 | 11,769 | 11,769 |
| Installed renewables - Solar - Constrained land use assumptions (MW) | 1,239 | 1,239 | 30,205 | 46,067 | 57,155 | 66,560 | 74,890 |
| Installed renewables - Offshore Wind - Constrained land use assumptions (MW) | 0 | 0 | 0 | 0 | 2,531 | 12,529 | 12,529 |
| Capital invested - Solar PV - Base (billion \$2018) | | 0 | 35.5 | 14.2 | 14.3 | 9.91 | 10 |
| Capital invested - Offshore Wind - Base (billion \$2018) | | 0 | 0 | 0 | 3.68 | 14.2 | 0 |

Table 9: *E+ scenario - PILLAR 2: Clean Electricity - Generating capacity (continued)*

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|------|------|------|------|------|------|------|
| Capital invested - Solar PV - Constrained (billion \$2018) | | 2.3 | 37.4 | 16.2 | 10.5 | 9.49 | 9.42 |
| Capital invested - Offshore Wind - Constrained (billion \$2018) | | 0 | 0 | 0 | 4.4 | 14.7 | 0 |
| Capital invested - Biomass power plant (billion \$2018) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Capital invested - Biomass w/ccu allam power plant (billion \$2018) | 0 | 0 | 0 | 0 | 0 | 0.01 | 0 |
| Capital invested - Biomass w/ccu power plant (billion \$2018) | 0 | 0 | 0 | 0 | 4.36 | 5.17 | 0 |

Table 10: *E+ scenario - PILLAR 2: Clean Electricity - Generation*

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|-------|-------|--------|--------|---------|---------|---------|
| Solar - Base land use assumptions (GWh) | 3,487 | 3,487 | 62,242 | 87,635 | 114,735 | 134,660 | 156,045 |
| Wind - Base land use assumptions (GWh) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| OffshoreWind - Base land use assumptions (GWh) | 0 | 0 | 0 | 0 | 7,713 | 42,161 | 42,161 |
| Solar - Constrained land use assumptions (GWh) | 2,906 | 2,906 | 60,261 | 91,569 | 113,397 | 132,008 | 148,392 |
| Wind - Constrained land use assumptions (GWh) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| OffshoreWind - Constrained land use assumptions (GWh) | 0 | 0 | 0 | 0 | 7,713 | 42,161 | 42,161 |
| Biomass power plant (GWh) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Biomass w/ccu power plant (GWh) | 0 | 0 | 0 | 0 | 4,889 | 10,689 | 10,689 |
| Biomass w/ccu allam power plant (GWh) | 0 | 0 | 0 | 0 | 0 | 10.4 | 10.4 |

Table 11: *E+ scenario - PILLAR 3: Clean fuels - Bioenergy*

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|------|------|------|------|-------|-------|-------|
| Number of facilities - Power (quantity) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Number of facilities - Power ccu (quantity) | 0 | 0 | 0 | 0 | 4 | 8 | 8 |
| Number of facilities - Allam power w ccu (quantity) | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| Number of facilities - Beccs hydrogen (quantity) | 0 | 0 | 0 | 0 | 0 | 4 | 9 |
| Number of facilities - Diesel (quantity) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Number of facilities - Diesel ccu (quantity) | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| Number of facilities - Pyrolysis (quantity) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Number of facilities - Pyrolysis ccu (quantity) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Number of facilities - Sng (quantity) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Number of facilities - Sng ccu (quantity) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Conversion capital investment - Cumulative 5-yr (million \$2018) | | 0 | 0 | 0 | 3,995 | 8,172 | 4,970 |
| Biomass purchases (million \$2018/y) | | 0 | 0 | 0 | 175 | 556 | 808 |

Table 12: *E+ scenario - PILLAR 4: CCUS - CO2 capture*

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|------------------------------------|------|------|------|------|------|------|------|
| Annual - All (MMT) | | 0 | 0 | 1.72 | 9.44 | 19.9 | 26.4 |
| Annual - BECCS (MMT) | | 0 | 0 | 0 | 4.67 | 15.4 | 21.7 |
| Annual - NGCC (MMT) | | 0 | 0 | 1.72 | 1.45 | 1.11 | 1.12 |
| Annual - Cement and lime (MMT) | | 0 | 0 | 0 | 3.32 | 3.42 | 3.53 |
| Cumulative - All (MMT) | | 0 | 0 | 1.72 | 11.2 | 31 | 57.4 |
| Cumulative - BECCS (MMT) | | 0 | 0 | 0 | 4.67 | 20 | 41.8 |
| Cumulative - NGCC (MMT) | | 0 | 0 | 1.72 | 3.17 | 4.28 | 5.4 |
| Cumulative - Cement and lime (MMT) | | 0 | 0 | 0 | 3.32 | 6.74 | 10.3 |

Table 13: *E+ scenario - PILLAR 4: CCUS - CO2 pipelines*

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|------|------|------|------|-------|-------|-------|
| Trunk (km) | | 0 | 0 | 159 | 159 | 159 | 159 |
| Spur (km) | | 0 | 0 | 18.7 | 690 | 1,298 | 1,616 |
| All (km) | | 0 | 0 | 178 | 849 | 1,457 | 1,776 |
| Cumulative investment - Trunk (million \$2018) | | 0 | 0 | 951 | 951 | 951 | 951 |
| Cumulative investment - Spur (million \$2018) | | 0 | 0 | 11.3 | 767 | 1,307 | 1,655 |
| Cumulative investment - All (million \$2018) | | 0 | 0 | 962 | 1,718 | 2,258 | 2,606 |

Table 14: *E+ scenario - PILLAR 4: CCUS - CO2 storage*

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|------|------|------|------|------|------|------|
| Annual (MMT) | | 0 | 0 | 0 | 0 | 0 | 0 |
| Injection wells (wells) | | 0 | 0 | 0 | 0 | 2 | 2 |
| Resource characterization, appraisal, permitting costs (million \$2020) | | 3.29 | 7.9 | 10.5 | 10.5 | 10.5 | 10.5 |
| Wells and facilities construction costs (million \$2020) | | 0 | 4.11 | 16 | 28.5 | 47.7 | 59.2 |

Table 15: *E+ scenario - PILLAR 6: Land sinks - Forests*

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|------|------|------|------|------|------|---------|
| Carbon sink potential - Low - Accelerate regeneration (1000 tCO2e/y) | | | | | | | -158 |
| Carbon sink potential - Low - Avoid deforestation (1000 tCO2e/y) | | | | | | | -274 |
| Carbon sink potential - Low - Extend rotation length (1000 tCO2e/y) | | | | | | | -2,808 |
| Carbon sink potential - Low - Improve plantations (1000 tCO2e/y) | | | | | | | -1,420 |
| Carbon sink potential - Low - Increase retention of HWP (1000 tCO2e/y) | | | | | | | -5,902 |
| Carbon sink potential - Low - Increase trees outside forests (1000 tCO2e/y) | | | | | | | -187 |
| Carbon sink potential - Low - Reforest cropland (1000 tCO2e/y) | | | | | | | -407 |
| Carbon sink potential - Low - Reforest pasture (1000 tCO2e/y) | | | | | | | -183 |
| Carbon sink potential - Low - Restore productivity (1000 tCO2e/y) | | | | | | | -922 |
| Carbon sink potential - Low - All (not counting overlap) (1000 tCO2e/y) | | | | | | | -12,261 |
| Carbon sink potential - Mid - Accelerate regeneration (1000 tCO2e/y) | | | | | | | -236 |
| Carbon sink potential - Mid - Avoid deforestation (1000 tCO2e/y) | | | | | | | -960 |
| Carbon sink potential - Mid - Extend rotation length (1000 tCO2e/y) | | | | | | | -5,059 |
| Carbon sink potential - Mid - Improve plantations (1000 tCO2e/y) | | | | | | | -2,081 |
| Carbon sink potential - Mid - Increase retention of HWP (1000 tCO2e/y) | | | | | | | -11,805 |
| Carbon sink potential - Mid - Increase trees outside forests (1000 tCO2e/y) | | | | | | | -360 |
| Carbon sink potential - Mid - Reforest cropland (1000 tCO2e/y) | | | | | | | -610 |

Table 15: *E+ scenario - PILLAR 6: Land sinks - Forests (continued)*

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|------|------|------|------|------|------|---------|
| Carbon sink potential - Mid - Reforest pasture (1000 tCO ₂ e/y) | | | | | | | -1,303 |
| Carbon sink potential - Mid - Restore productivity (1000 tCO ₂ e/y) | | | | | | | -1,829 |
| Carbon sink potential - Mid - All (not counting overlap) (1000 tCO ₂ e/y) | | | | | | | -24,243 |
| Carbon sink potential - High - Accelerate regeneration (1000 tCO ₂ e/y) | | | | | | | -315 |
| Carbon sink potential - High - Avoid deforestation (1000 tCO ₂ e/y) | | | | | | | -1,646 |
| Carbon sink potential - High - Extend rotation length (1000 tCO ₂ e/y) | | | | | | | -7,310 |
| Carbon sink potential - High - Improve plantations (1000 tCO ₂ e/y) | | | | | | | -2,791 |
| Carbon sink potential - High - Increase retention of HWP (1000 tCO ₂ e/y) | | | | | | | -17,707 |
| Carbon sink potential - High - Increase trees outside forests (1000 tCO ₂ e/y) | | | | | | | -534 |
| Carbon sink potential - High - Reforest cropland (1000 tCO ₂ e/y) | | | | | | | -813 |
| Carbon sink potential - High - Reforest pasture (1000 tCO ₂ e/y) | | | | | | | -2,422 |
| Carbon sink potential - High - All (not counting overlap) (1000 tCO ₂ e/y) | | | | | | | -36,273 |
| Carbon sink potential - High - Restore productivity (1000 tCO ₂ e/y) | | | | | | | -2,736 |
| Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares) | | | | | | | 25.7 |
| Land impacted for carbon sink potential - Low - Avoid deforestation (over 30 years) (1000 hectares) | | | | | | | 209 |
| Land impacted for carbon sink potential - Low - Extend rotation length (1000 hectares) | | | | | | | 1,428 |
| Land impacted for carbon sink potential - Low - Improve plantations (1000 hectares) | | | | | | | 514 |
| Land impacted for carbon sink potential - Low - Increase retention of HWP (1000 hectares) | | | | | | | 0 |
| Land impacted for carbon sink potential - Low - Increase trees outside forests (1000 hectares) | | | | | | | 26.7 |
| Land impacted for carbon sink potential - Low - Reforest cropland (1000 hectares) | | | | | | | 26.9 |
| Land impacted for carbon sink potential - Low - Reforest pasture (1000 hectares) | | | | | | | 11.9 |
| Land impacted for carbon sink potential - Low - Restore productivity (1000 hectares) | | | | | | | 549 |
| Land impacted for carbon sink potential - Low - Total impacted (over 30 years) (1000 hectares) | | | | | | | 2,791 |
| Land impacted for carbon sink potential - Mid - Accelerate regeneration (1000 hectares) | | | | | | | 38.6 |
| Land impacted for carbon sink potential - Mid - Avoid deforestation (over 30 years) (1000 hectares) | | | | | | | 216 |

Table 15: *E+ scenario - PILLAR 6: Land sinks - Forests (continued)*

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|------|------|------|------|------|------|-------|
| Land impacted for carbon sink potential - Mid - Extend rotation length (1000 hectares) | | | | | | | 2,578 |
| Land impacted for carbon sink potential - Mid - Improve plantations (1000 hectares) | | | | | | | 774 |
| Land impacted for carbon sink potential - Mid - Increase retention of HWP (1000 hectares) | | | | | | | 0 |
| Land impacted for carbon sink potential - Mid - Increase trees outside forests (1000 hectares) | | | | | | | 38.7 |
| Land impacted for carbon sink potential - Mid - Reforest cropland (1000 hectares) | | | | | | | 40.3 |
| Land impacted for carbon sink potential - Mid - Reforest pasture (1000 hectares) | | | | | | | 86.2 |
| Land impacted for carbon sink potential - Mid - Restore productivity (1000 hectares) | | | | | | | 1,105 |
| Land impacted for carbon sink potential - Mid - Total impacted (over 30 years) (1000 hectares) | | | | | | | 4,876 |
| Land impacted for carbon sink potential - High - Accelerate regeneration (1000 hectares) | | | | | | | 51.5 |
| Land impacted for carbon sink potential - High - Avoid deforestation (over 30 years) (1000 hectares) | | | | | | | 223 |
| Land impacted for carbon sink potential - High - Extend rotation length (1000 hectares) | | | | | | | 3,727 |
| Land impacted for carbon sink potential - High - Improve plantations (1000 hectares) | | | | | | | 1,028 |
| Land impacted for carbon sink potential - High - Increase retention of HWP (1000 hectares) | | | | | | | 0 |
| Land impacted for carbon sink potential - High - Increase trees outside forests (1000 hectares) | | | | | | | 50.7 |
| Land impacted for carbon sink potential - High - Reforest cropland (1000 hectares) | | | | | | | 53.8 |
| Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares) | | | | | | | 68.8 |
| Land impacted for carbon sink potential - High - Restore productivity (1000 hectares) | | | | | | | 907 |
| Land impacted for carbon sink potential - High - Total impacted (over 30 years) (1000 hectares) | | | | | | | 6,110 |

Table 16: *E+ scenario - PILLAR 6: Land sinks - Agriculture*

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|------|------|------|------|------|------|-------|
| Carbon sink potential - Moderate deployment - Corn-ethanol to energy grasses (1000 tCO ₂ e/y) | | | | | | | -81.8 |
| Carbon sink potential - Moderate deployment - Cropland measures (1000 tCO ₂ e/y) | | | | | | | -677 |

Table 16: *E+ scenario - PILLAR 6: Land sinks - Agriculture (continued)*

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|------|------|------|------|------|------|--------|
| Carbon sink potential - Moderate deployment - Permanent conservation cover (1000 tCO ₂ e/y) | | | | | | | -19.4 |
| Carbon sink potential - Moderate deployment - Total (1000 tCO ₂ e/y) | | | | | | | -778 |
| Carbon sink potential - Aggressive deployment - Corn-ethanol to energy grasses (1000 tCO ₂ e/y) | | | | | | | -81.8 |
| Carbon sink potential - Aggressive deployment - Cropland measures (1000 tCO ₂ e/y) | | | | | | | -1,291 |
| Carbon sink potential - Aggressive deployment - Permanent conservation cover (1000 tCO ₂ e/y) | | | | | | | -38.7 |
| Carbon sink potential - Aggressive deployment - Total (1000 tCO ₂ e/y) | | | | | | | -1,411 |
| Land impacted for carbon sink - Moderate deployment - Corn-ethanol to energy grasses (1000 hectares) | | | | | | | 46.8 |
| Land impacted for carbon sink - Moderate deployment - Cropland measures (1000 hectares) | | | | | | | 371 |
| Land impacted for carbon sink - Moderate deployment - Permanent conservation cover (1000 hectares) | | | | | | | 35.2 |
| Land impacted for carbon sink - Moderate deployment - Total (1000 hectares) | | | | | | | 453 |
| Land impacted for carbon sink - Aggressive deployment - Corn-ethanol to energy grasses (1000 hectares) | | | | | | | 46.8 |
| Land impacted for carbon sink - Aggressive deployment - Cropland measures (1000 hectares) | | | | | | | 707 |
| Land impacted for carbon sink - Aggressive deployment - Permanent conservation cover (1000 hectares) | | | | | | | 70.4 |
| Land impacted for carbon sink - Aggressive deployment - Total (1000 hectares) | | | | | | | 824 |

Table 17: *E- scenario - IMPACTS - Health*

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|------|------|-------|-------|-------|-------|-------|
| Premature deaths from air pollution - Fuel Comb - Electric Generation - Coal (deaths) | | 30.4 | 0.049 | 0.046 | 0.036 | 0.025 | 0.002 |
| Premature deaths from air pollution - Fuel Comb - Electric Generation - Natural Gas (deaths) | | 19.9 | 13.1 | 5.23 | 1.96 | 0.644 | 0.341 |
| Premature deaths from air pollution - Mobile - On-Road (deaths) | | 119 | 121 | 119 | 108 | 86.8 | 60.1 |
| Premature deaths from air pollution - Gas Stations (deaths) | | 15.7 | 16 | 15.5 | 14 | 11.2 | 7.83 |
| Premature deaths from air pollution - Fuel Comb - Residential - Natural Gas (deaths) | | 10.3 | 9.4 | 8.34 | 6.91 | 5.21 | 3.52 |
| Premature deaths from air pollution - Fuel Comb - Residential - Oil (deaths) | | 1.85 | 1.76 | 1.67 | 1.46 | 1.11 | 0.74 |
| Premature deaths from air pollution - Fuel Comb - Residential - Other (deaths) | | 2.14 | 2.15 | 2.14 | 1.98 | 1.62 | 1.2 |

Table 17: *E- scenario - IMPACTS - Health (continued)*

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|------|-------|-------|-------|-------|-------|-------|
| Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Coal (deaths) | | 1.58 | 1.52 | 1.46 | 1.4 | 1.33 | 1.25 |
| Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Natural Gas (deaths) | | 8.43 | 8.39 | 8.1 | 7.2 | 5.81 | 4.32 |
| Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Oil (deaths) | | 1.51 | 1.38 | 1.25 | 1.08 | 0.911 | 0.742 |
| Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Other (deaths) | | 1.47 | 1.36 | 1.24 | 1.11 | 0.986 | 0.861 |
| Premature deaths from air pollution - Industrial Processes - Coal Mining (deaths) | | 0.596 | 0.317 | 0.32 | 0.32 | 0.322 | 0.312 |
| Premature deaths from air pollution - Industrial Processes - Oil & Gas Production (deaths) | | 24.7 | 22.4 | 19.3 | 16.8 | 14.9 | 10.6 |
| Monetary damages from air pollution - Fuel Comb - Electric Generation - Coal (million \$2019) | | 269 | 0.437 | 0.407 | 0.323 | 0.225 | 0.019 |
| Monetary damages from air pollution - Fuel Comb - Electric Generation - Natural Gas (million \$2019) | | 176 | 116 | 46.3 | 17.4 | 5.7 | 3.02 |
| Monetary damages from air pollution - Mobile - On-Road (million \$2019) | | 1,058 | 1,078 | 1,057 | 961 | 772 | 534 |
| Monetary damages from air pollution - Gas Stations (million \$2019) | | 139 | 141 | 138 | 124 | 99.6 | 69.4 |
| Monetary damages from air pollution - Fuel Comb - Residential - Natural Gas (million \$2019) | | 91.5 | 83.3 | 73.9 | 61.3 | 46.2 | 31.2 |
| Monetary damages from air pollution - Fuel Comb - Residential - Oil (million \$2019) | | 16.4 | 15.6 | 14.8 | 12.9 | 9.87 | 6.56 |
| Monetary damages from air pollution - Fuel Comb - Residential - Other (million \$2019) | | 19 | 19.1 | 19 | 17.5 | 14.3 | 10.7 |
| Monetary damages from air pollution - Fuel Comb - Comm/Institutional - Coal (million \$2019) | | 14 | 13.5 | 12.9 | 12.4 | 11.7 | 11 |
| Monetary damages from air pollution - Fuel Comb - Comm/Institutional - Natural Gas (million \$2019) | | 74.6 | 74.3 | 71.7 | 63.7 | 51.4 | 38.2 |
| Monetary damages from air pollution - Fuel Comb - Comm/Institutional - Oil (million \$2019) | | 13.4 | 12.2 | 11.1 | 9.6 | 8.06 | 6.57 |
| Monetary damages from air pollution - Fuel Comb - Comm/Institutional - Other (million \$2019) | | 13 | 12 | 11 | 9.86 | 8.73 | 7.62 |
| Monetary damages from air pollution - Industrial Processes - Coal Mining (million \$2019) | | 5.26 | 2.8 | 2.82 | 2.82 | 2.84 | 2.75 |
| Monetary damages from air pollution - Industrial Processes - Oil & Gas Production (million \$2019) | | 219 | 199 | 172 | 150 | 132 | 94.3 |

Table 18: *E- scenario - IMPACTS - Jobs*

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|------|-------|--------|--------|--------|--------|--------|
| By economic sector - Agriculture (jobs) | | 222 | 284 | 109 | 462 | 989 | 942 |
| By economic sector - Construction (jobs) | | 5,031 | 30,467 | 19,886 | 22,636 | 27,885 | 27,171 |

Table 18: E- scenario - IMPACTS - Jobs (continued)

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|------|--------|--------|--------|--------|--------|--------|
| By economic sector - Manufacturing (jobs) | | 3,134 | 5,562 | 4,876 | 5,125 | 8,075 | 7,034 |
| By economic sector - Mining (jobs) | | 1,867 | 1,295 | 961 | 690 | 474 | 270 |
| By economic sector - Other (jobs) | | 448 | 6,057 | 3,586 | 4,511 | 5,414 | 6,143 |
| By economic sector - Pipeline (jobs) | | 369 | 310 | 458 | 321 | 370 | 379 |
| By economic sector - Professional (jobs) | | 2,995 | 11,931 | 7,995 | 10,062 | 13,146 | 13,035 |
| By economic sector - Trade (jobs) | | 2,185 | 8,137 | 5,496 | 6,727 | 8,426 | 8,755 |
| By economic sector - Utilities (jobs) | | 7,529 | 13,371 | 14,956 | 16,947 | 24,259 | 21,776 |
| By resource sector - Biomass (jobs) | | 842 | 765 | 360 | 1,942 | 4,214 | 3,885 |
| By resource sector - CO2 (jobs) | | 1.63 | 4.82 | 1,648 | 853 | 1,607 | 2,117 |
| By resource sector - Coal (jobs) | | 1,332 | 299 | 0 | 0 | 0 | 0 |
| By resource sector - Grid (jobs) | | 7,675 | 20,030 | 22,826 | 28,675 | 43,975 | 39,362 |
| By resource sector - Natural Gas (jobs) | | 3,318 | 2,723 | 2,587 | 2,172 | 2,292 | 1,291 |
| By resource sector - Nuclear (jobs) | | 2,635 | 2,593 | 2,552 | 2,160 | 1,629 | 1,604 |
| By resource sector - Oil (jobs) | | 4,363 | 3,667 | 3,088 | 2,481 | 1,886 | 1,171 |
| By resource sector - Solar (jobs) | | 3,599 | 47,112 | 25,116 | 28,669 | 31,394 | 34,836 |
| By resource sector - Wind (jobs) | | 15.5 | 221 | 144 | 529 | 2,040 | 1,239 |
| By education level - All sectors - High school diploma or less (jobs) | | 9,808 | 33,577 | 25,007 | 28,944 | 38,250 | 36,681 |
| By education level - All sectors - Associates degree or some college (jobs) | | 7,310 | 24,709 | 18,762 | 21,650 | 28,616 | 27,516 |
| By education level - All sectors - Bachelors degree (jobs) | | 5,212 | 14,809 | 11,320 | 13,084 | 17,196 | 16,489 |
| By education level - All sectors - Masters or professional degree (jobs) | | 1,272 | 3,721 | 2,821 | 3,309 | 4,346 | 4,198 |
| By education level - All sectors - Doctoral degree (jobs) | | 179 | 598 | 414 | 495 | 630 | 620 |
| Related work experience - All sectors - None (jobs) | | 3,398 | 11,277 | 8,534 | 9,912 | 13,131 | 12,636 |
| Related work experience - All sectors - Up to 1 year (jobs) | | 4,633 | 16,264 | 11,885 | 13,841 | 18,230 | 17,587 |
| Related work experience - All sectors - 1 to 4 years (jobs) | | 8,671 | 27,487 | 20,852 | 24,121 | 31,831 | 30,554 |
| Related work experience - All sectors - 4 to 10 years (jobs) | | 5,575 | 17,836 | 13,555 | 15,602 | 20,549 | 19,678 |
| Related work experience - All sectors - Over 10 years (jobs) | | 1,503 | 4,549 | 3,498 | 4,005 | 5,298 | 5,049 |
| On-the-Job Training - All sectors - None (jobs) | | 1,311 | 4,431 | 3,224 | 3,740 | 4,845 | 4,712 |
| On-the-Job Training - All sectors - Up to 1 year (jobs) | | 15,803 | 49,858 | 37,652 | 43,709 | 57,904 | 55,580 |
| On-the-Job Training - All sectors - 1 to 4 years (jobs) | | 4,933 | 16,580 | 12,600 | 14,465 | 19,047 | 18,244 |
| On-the-Job Training - All sectors - 4 to 10 years (jobs) | | 1,511 | 5,738 | 4,275 | 4,922 | 6,415 | 6,173 |
| On-the-Job Training - All sectors - Over 10 years (jobs) | | 223 | 806 | 573 | 646 | 826 | 795 |
| On-Site or In-Plant Training - All sectors - None (jobs) | | 3,851 | 12,800 | 9,458 | 10,955 | 14,352 | 13,852 |
| On-Site or In-Plant Training - All sectors - Up to 1 year (jobs) | | 14,335 | 45,399 | 34,337 | 39,823 | 52,731 | 50,604 |
| On-Site or In-Plant Training - All sectors - 1 to 4 years (jobs) | | 3,830 | 12,846 | 9,745 | 11,203 | 14,763 | 14,146 |
| On-Site or In-Plant Training - All sectors - 4 to 10 years (jobs) | | 1,571 | 5,695 | 4,265 | 4,901 | 6,391 | 6,135 |
| On-Site or In-Plant Training - All sectors - Over 10 years (jobs) | | 193 | 674 | 519 | 601 | 801 | 766 |
| Wage income - All (million \$2019) | | 1,239 | 3,785 | 2,945 | 3,440 | 4,605 | 4,461 |

Table 19: E- scenario - PILLAR 1: Efficiency/Electrification - Overview

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|------|------|------|------|------|------|------|
| Final energy use - Transportation (PJ) | 464 | 441 | 404 | 373 | 350 | 323 | 290 |
| Final energy use - Residential (PJ) | 158 | 151 | 147 | 142 | 135 | 128 | 122 |
| Final energy use - Commercial (PJ) | 114 | 115 | 113 | 112 | 109 | 107 | 107 |
| Final energy use - Industry (PJ) | 358 | 374 | 381 | 391 | 402 | 403 | 407 |

Table 20: E- scenario - PILLAR 1: Efficiency/Electrification - Electricity demand

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|------|------|------|------|------|------|------|
| Electricity distribution capital invested - Cumulative 5-yr (billion \$2018) | | 2.92 | 2.93 | 3.93 | 4.05 | 5.12 | 5.35 |

Table 21: E- scenario - PILLAR 1: Efficiency/Electrification - Transportation

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|-------|-------|-------|-------|-------|-------|-------|
| Vehicle stocks - LDV – EV (1000 units) | 13.5 | 121 | 228 | 724 | 1,221 | 2,319 | 3,418 |
| Vehicle stocks - LDV – All others (1000 units) | 4,468 | 4,468 | 4,468 | 4,238 | 4,008 | 3,089 | 2,169 |
| Light-duty vehicle capital costs vs. REF - Cumulative 5-yr (million \$2018) | | 0 | 138 | 291 | 982 | 3,094 | 4,506 |
| Public EV charging plugs - DC Fast (1000 units) | 0.1 | | 0.496 | | 2.66 | | 7.45 |
| Public EV charging plugs - L2 (1000 units) | 0.476 | | 11.9 | | 63.9 | | 179 |

Table 22: E- scenario - PILLAR 1: Efficiency/Electrification - Residential

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|------|------|------|------|------|------|-------|
| Sales of space heating units - Electric Heat Pump (%) | 37.5 | 46.3 | 49.6 | 59.1 | 73.7 | 83 | 86.3 |
| Sales of space heating units - Electric Resistance (%) | 25.8 | 28.1 | 26.5 | 21.5 | 14 | 9.4 | 7.8 |
| Sales of space heating units - Gas (%) | 30.5 | 17.1 | 15.8 | 12.4 | 7.01 | 3.39 | 2.12 |
| Sales of space heating units - Fossil (%) | 6.1 | 8.46 | 8.09 | 7 | 5.31 | 4.17 | 3.78 |
| Sales of water heating units - Electric Heat Pump (%) | 0 | 2.08 | 8 | 25 | 51.1 | 68.2 | 74.1 |
| Sales of water heating units - Electric Resistance (%) | 67.7 | 78.2 | 73.7 | 60.5 | 40.4 | 27.4 | 22.9 |
| Sales of water heating units - Gas Furnace (%) | 28.2 | 17 | 15.7 | 11.9 | 5.84 | 1.86 | 0.487 |
| Sales of water heating units - Other (%) | 4.1 | 2.66 | 2.65 | 2.64 | 2.62 | 2.58 | 2.57 |
| Sales of cooking units - Electric Resistance (%) | 82.6 | 83.1 | 84.7 | 88.9 | 94.7 | 98.3 | 99.5 |
| Sales of cooking units - Gas (%) | 17.4 | 16.9 | 15.3 | 11.1 | 5.31 | 1.72 | 0.462 |
| Residential HVAC investment in 2020s vs. REF - Cumulative 5-yr (billion \$2018) | | 3.78 | 4.05 | | | | |

Table 23: E- scenario - PILLAR 1: Efficiency/Electrification - Commercial

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|-------|------|------|------|------|-------|------|
| Sales of space heating units - Electric Heat Pump (%) | 10.1 | 19.3 | 24.3 | 38.5 | 60.9 | 76.8 | 82.9 |
| Sales of space heating units - Electric Resistance (%) | 9.29 | 8.02 | 8.23 | 8.98 | 10.4 | 11.8 | 12.5 |
| Sales of space heating units - Gas (%) | 78.5 | 68.1 | 63.3 | 49.4 | 27.1 | 10.9 | 4.44 |
| Sales of space heating units - Fossil (%) | 2.15 | 4.53 | 4.19 | 3.17 | 1.56 | 0.496 | 0.13 |
| Sales of water heating units - Electric Heat Pump (%) | 0.316 | 2.04 | 7.05 | 21.5 | 43.6 | 58 | 63 |
| Sales of water heating units - Electric Resistance (%) | 7.81 | 7.62 | 9.51 | 15.3 | 24.1 | 29.8 | 31.8 |
| Sales of water heating units - Gas (%) | 88 | 86.1 | 79.2 | 59.5 | 29.1 | 9.29 | 2.42 |
| Sales of water heating units - Other (%) | 3.86 | 4.23 | 4.21 | 3.8 | 3.27 | 2.9 | 2.77 |

Table 23: E- scenario - PILLAR 1: Efficiency/Electrification - Commercial (continued)

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|------|--------|--------|------|------|------|------|
| Sales of cooking units - Electric Resistance (%) | 32 | 36.2 | 40.9 | 53.4 | 71 | 81.7 | 85.5 |
| Sales of cooking units - Gas (%) | 68 | 63.8 | 59.1 | 46.6 | 29 | 18.3 | 14.5 |
| Commercial HVAC investment in 2020s - Cumulative 5-yr (million \$2018) | | 15,746 | 17,554 | | | | |

Table 24: E- scenario - PILLAR 2: Clean Electricity - Generating capacity

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--------------------------------------|-------|-------|-------|-------|-------|-------|-------|
| Installed thermal - Coal (MW) | 5,499 | 0 | 0 | 0 | 0 | 0 | 0 |
| Installed thermal - Natural gas (MW) | 6,450 | 7,811 | 7,128 | 6,628 | 6,185 | 5,668 | 5,630 |
| Installed thermal - Nuclear (MW) | 5,220 | 5,220 | 5,220 | 5,220 | 3,440 | 3,440 | 3,440 |

Table 25: E- scenario - PILLAR 6: Land sinks - Forests

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|------|------|------|------|------|------|---------|
| Carbon sink potential - Low - Accelerate regeneration (1000 tCO2e/y) | | | | | | | -158 |
| Carbon sink potential - Low - Avoid deforestation (1000 tCO2e/y) | | | | | | | -274 |
| Carbon sink potential - Low - Extend rotation length (1000 tCO2e/y) | | | | | | | -2,808 |
| Carbon sink potential - Low - Improve plantations (1000 tCO2e/y) | | | | | | | -1,420 |
| Carbon sink potential - Low - Increase retention of HWP (1000 tCO2e/y) | | | | | | | -5,902 |
| Carbon sink potential - Low - Increase trees outside forests (1000 tCO2e/y) | | | | | | | -187 |
| Carbon sink potential - Low - Reforest cropland (1000 tCO2e/y) | | | | | | | -407 |
| Carbon sink potential - Low - Reforest pasture (1000 tCO2e/y) | | | | | | | -183 |
| Carbon sink potential - Low - Restore productivity (1000 tCO2e/y) | | | | | | | -922 |
| Carbon sink potential - Low - All (not counting overlap) (1000 tCO2e/y) | | | | | | | -12,261 |
| Carbon sink potential - Mid - Accelerate regeneration (1000 tCO2e/y) | | | | | | | -236 |
| Carbon sink potential - Mid - Avoid deforestation (1000 tCO2e/y) | | | | | | | -960 |
| Carbon sink potential - Mid - Extend rotation length (1000 tCO2e/y) | | | | | | | -5,059 |
| Carbon sink potential - Mid - Improve plantations (1000 tCO2e/y) | | | | | | | -2,081 |
| Carbon sink potential - Mid - Increase retention of HWP (1000 tCO2e/y) | | | | | | | -11,805 |
| Carbon sink potential - Mid - Increase trees outside forests (1000 tCO2e/y) | | | | | | | -360 |
| Carbon sink potential - Mid - Reforest cropland (1000 tCO2e/y) | | | | | | | -610 |
| Carbon sink potential - Mid - Reforest pasture (1000 tCO2e/y) | | | | | | | -1,303 |
| Carbon sink potential - Mid - Restore productivity (1000 tCO2e/y) | | | | | | | -1,829 |
| Carbon sink potential - Mid - All (not counting overlap) (1000 tCO2e/y) | | | | | | | -24,243 |
| Carbon sink potential - High - Accelerate regeneration (1000 tCO2e/y) | | | | | | | -315 |
| Carbon sink potential - High - Avoid deforestation (1000 tCO2e/y) | | | | | | | -1,646 |

Table 25: E- scenario - PILLAR 6: Land sinks - Forests (continued)

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|------|------|------|------|------|------|---------|
| Carbon sink potential - High - Extend rotation length (1000 tCO2e/y) | | | | | | | -7,310 |
| Carbon sink potential - High - Improve plantations (1000 tCO2e/y) | | | | | | | -2,791 |
| Carbon sink potential - High - Increase retention of HWP (1000 tCO2e/y) | | | | | | | -17,707 |
| Carbon sink potential - High - Increase trees outside forests (1000 tCO2e/y) | | | | | | | -534 |
| Carbon sink potential - High - Reforest cropland (1000 tCO2e/y) | | | | | | | -813 |
| Carbon sink potential - High - Reforest pasture (1000 tCO2e/y) | | | | | | | -2,422 |
| Carbon sink potential - High - All (not counting overlap) (1000 tCO2e/y) | | | | | | | -36,273 |
| Carbon sink potential - High - Restore productivity (1000 tCO2e/y) | | | | | | | -2,736 |
| Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares) | | | | | | | 25.7 |
| Land impacted for carbon sink potential - Low - Avoid deforestation (over 30 years) (1000 hectares) | | | | | | | 209 |
| Land impacted for carbon sink potential - Low - Extend rotation length (1000 hectares) | | | | | | | 1,428 |
| Land impacted for carbon sink potential - Low - Improve plantations (1000 hectares) | | | | | | | 514 |
| Land impacted for carbon sink potential - Low - Increase retention of HWP (1000 hectares) | | | | | | | 0 |
| Land impacted for carbon sink potential - Low - Increase trees outside forests (1000 hectares) | | | | | | | 26.7 |
| Land impacted for carbon sink potential - Low - Reforest cropland (1000 hectares) | | | | | | | 26.9 |
| Land impacted for carbon sink potential - Low - Reforest pasture (1000 hectares) | | | | | | | 11.9 |
| Land impacted for carbon sink potential - Low - Restore productivity (1000 hectares) | | | | | | | 549 |
| Land impacted for carbon sink potential - Low - Total impacted (over 30 years) (1000 hectares) | | | | | | | 2,791 |
| Land impacted for carbon sink potential - Mid - Accelerate regeneration (1000 hectares) | | | | | | | 38.6 |
| Land impacted for carbon sink potential - Mid - Avoid deforestation (over 30 years) (1000 hectares) | | | | | | | 216 |
| Land impacted for carbon sink potential - Mid - Extend rotation length (1000 hectares) | | | | | | | 2,578 |
| Land impacted for carbon sink potential - Mid - Improve plantations (1000 hectares) | | | | | | | 774 |
| Land impacted for carbon sink potential - Mid - Increase retention of HWP (1000 hectares) | | | | | | | 0 |
| Land impacted for carbon sink potential - Mid - Increase trees outside forests (1000 hectares) | | | | | | | 38.7 |

Table 25: E- scenario - PILLAR 6: Land sinks - Forests (continued)

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|------|------|------|------|------|------|-------|
| Land impacted for carbon sink potential - Mid - Reforest cropland (1000 hectares) | | | | | | | 40.3 |
| Land impacted for carbon sink potential - Mid - Reforest pasture (1000 hectares) | | | | | | | 86.2 |
| Land impacted for carbon sink potential - Mid - Restore productivity (1000 hectares) | | | | | | | 1,105 |
| Land impacted for carbon sink potential - Mid - Total impacted (over 30 years) (1000 hectares) | | | | | | | 4,876 |
| Land impacted for carbon sink potential - High - Accelerate regeneration (1000 hectares) | | | | | | | 51.5 |
| Land impacted for carbon sink potential - High - Avoid deforestation (over 30 years) (1000 hectares) | | | | | | | 223 |
| Land impacted for carbon sink potential - High - Extend rotation length (1000 hectares) | | | | | | | 3,727 |
| Land impacted for carbon sink potential - High - Improve plantations (1000 hectares) | | | | | | | 1,028 |
| Land impacted for carbon sink potential - High - Increase retention of HWP (1000 hectares) | | | | | | | 0 |
| Land impacted for carbon sink potential - High - Increase trees outside forests (1000 hectares) | | | | | | | 50.7 |
| Land impacted for carbon sink potential - High - Reforest cropland (1000 hectares) | | | | | | | 53.8 |
| Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares) | | | | | | | 68.8 |
| Land impacted for carbon sink potential - High - Restore productivity (1000 hectares) | | | | | | | 907 |
| Land impacted for carbon sink potential - High - Total impacted (over 30 years) (1000 hectares) | | | | | | | 6,110 |

Table 26: E- scenario - PILLAR 6: Land sinks - Agriculture

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|------|------|------|------|------|------|--------|
| Carbon sink potential - Moderate deployment - Corn-ethanol to energy grasses (1000 tCO2e/y) | | | | | | | -81.8 |
| Carbon sink potential - Moderate deployment - Cropland measures (1000 tCO2e/y) | | | | | | | -677 |
| Carbon sink potential - Moderate deployment - Permanent conservation cover (1000 tCO2e/y) | | | | | | | -19.4 |
| Carbon sink potential - Moderate deployment - Total (1000 tCO2e/y) | | | | | | | -778 |
| Carbon sink potential - Aggressive deployment - Corn-ethanol to energy grasses (1000 tCO2e/y) | | | | | | | -81.8 |
| Carbon sink potential - Aggressive deployment - Cropland measures (1000 tCO2e/y) | | | | | | | -1,291 |

Table 26: E- scenario - PILLAR 6: Land sinks - Agriculture (continued)

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|------|------|------|------|------|------|--------|
| Carbon sink potential - Aggressive deployment - Permanent conservation cover (1000 tCO ₂ e/y) | | | | | | | -38.7 |
| Carbon sink potential - Aggressive deployment - Total (1000 tCO ₂ e/y) | | | | | | | -1,411 |
| Land impacted for carbon sink - Moderate deployment - Corn-ethanol to energy grasses (1000 hectares) | | | | | | | 46.8 |
| Land impacted for carbon sink - Moderate deployment - Cropland measures (1000 hectares) | | | | | | | 371 |
| Land impacted for carbon sink - Moderate deployment - Permanent conservation cover (1000 hectares) | | | | | | | 35.2 |
| Land impacted for carbon sink - Moderate deployment - Total (1000 hectares) | | | | | | | 453 |
| Land impacted for carbon sink - Aggressive deployment - Corn-ethanol to energy grasses (1000 hectares) | | | | | | | 46.8 |
| Land impacted for carbon sink - Aggressive deployment - Cropland measures (1000 hectares) | | | | | | | 707 |
| Land impacted for carbon sink - Aggressive deployment - Permanent conservation cover (1000 hectares) | | | | | | | 70.4 |
| Land impacted for carbon sink - Aggressive deployment - Total (1000 hectares) | | | | | | | 824 |

Table 27: E+RE+ scenario - IMPACTS - Health

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|------|------|-------|-------|-------|-------|-------|
| Premature deaths from air pollution - Fuel Comb - Electric Generation - Coal (deaths) | | 30.4 | 0.049 | 0.046 | 0.036 | 0.025 | 0.002 |
| Premature deaths from air pollution - Fuel Comb - Electric Generation - Natural Gas (deaths) | | 20.4 | 16 | 9.08 | 5.46 | 1.39 | 0.425 |
| Premature deaths from air pollution - Mobile - On-Road (deaths) | | 117 | 110 | 84.4 | 49.2 | 22.6 | 8.97 |
| Premature deaths from air pollution - Gas Stations (deaths) | | 15.4 | 14.2 | 10.8 | 6.43 | 3.13 | 1.47 |
| Premature deaths from air pollution - Fuel Comb - Residential - Natural Gas (deaths) | | 10.2 | 8.38 | 5.66 | 3.2 | 1.61 | 0.781 |
| Premature deaths from air pollution - Fuel Comb - Residential - Oil (deaths) | | 1.82 | 1.48 | 1.02 | 0.612 | 0.302 | 0.135 |
| Premature deaths from air pollution - Fuel Comb - Residential - Other (deaths) | | 2.11 | 1.9 | 1.49 | 1.02 | 0.602 | 0.339 |
| Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Coal (deaths) | | 1.58 | 1.52 | 1.46 | 1.4 | 1.33 | 1.25 |
| Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Natural Gas (deaths) | | 8.36 | 7.38 | 5.45 | 3.45 | 2.12 | 1.38 |
| Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Oil (deaths) | | 1.5 | 1.25 | 0.971 | 0.698 | 0.486 | 0.321 |
| Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Other (deaths) | | 1.47 | 1.27 | 1.06 | 0.843 | 0.63 | 0.422 |

Table 27: *E+RE+ scenario - IMPACTS - Health (continued)*

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|------|-------|-------|-------|-------|-------|-------|
| Premature deaths from air pollution - Industrial Processes - Coal Mining (deaths) | | 0.664 | 0.317 | 0.317 | 0.315 | 0.321 | 0.3 |
| Premature deaths from air pollution - Industrial Processes - Oil & Gas Production (deaths) | | 24.3 | 23 | 19.7 | 14.3 | 8.7 | 1.21 |
| Monetary damages from air pollution - Fuel Comb - Electric Generation - Coal (million \$2019) | | 269 | 0.437 | 0.407 | 0.323 | 0.225 | 0.019 |
| Monetary damages from air pollution - Fuel Comb - Electric Generation - Natural Gas (million \$2019) | | 181 | 141 | 80.5 | 48.4 | 12.3 | 3.77 |
| Monetary damages from air pollution - Mobile - On-Road (million \$2019) | | 1,041 | 979 | 750 | 437 | 201 | 79.7 |
| Monetary damages from air pollution - Gas Stations (million \$2019) | | 136 | 126 | 95.5 | 56.9 | 27.7 | 13 |
| Monetary damages from air pollution - Fuel Comb - Residential - Natural Gas (million \$2019) | | 90.7 | 74.2 | 50.2 | 28.3 | 14.3 | 6.92 |
| Monetary damages from air pollution - Fuel Comb - Residential - Oil (million \$2019) | | 16.1 | 13.1 | 9.05 | 5.43 | 2.68 | 1.2 |
| Monetary damages from air pollution - Fuel Comb - Residential - Other (million \$2019) | | 18.7 | 16.9 | 13.2 | 9.03 | 5.33 | 3.01 |
| Monetary damages from air pollution - Fuel Comb - Comm/Institutional - Coal (million \$2019) | | 14 | 13.5 | 12.9 | 12.4 | 11.7 | 11 |
| Monetary damages from air pollution - Fuel Comb - Comm/Institutional - Natural Gas (million \$2019) | | 74 | 65.3 | 48.2 | 30.5 | 18.8 | 12.2 |
| Monetary damages from air pollution - Fuel Comb - Comm/Institutional - Oil (million \$2019) | | 13.3 | 11.1 | 8.59 | 6.18 | 4.31 | 2.84 |
| Monetary damages from air pollution - Fuel Comb - Comm/Institutional - Other (million \$2019) | | 13 | 11.2 | 9.36 | 7.46 | 5.58 | 3.74 |
| Monetary damages from air pollution - Industrial Processes - Coal Mining (million \$2019) | | 5.86 | 2.8 | 2.8 | 2.78 | 2.83 | 2.64 |
| Monetary damages from air pollution - Industrial Processes - Oil & Gas Production (million \$2019) | | 215 | 204 | 175 | 127 | 77.3 | 10.8 |

Table 28: *E+RE+ scenario - IMPACTS - Jobs*

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|------|--------|--------|--------|--------|--------|--------|
| By economic sector - Agriculture (jobs) | | 183 | 380 | 141 | 288 | 633 | 938 |
| By economic sector - Construction (jobs) | | 18,671 | 25,335 | 30,825 | 27,742 | 30,160 | 26,713 |
| By economic sector - Manufacturing (jobs) | | 3,987 | 5,641 | 8,423 | 7,278 | 7,560 | 10,924 |
| By economic sector - Mining (jobs) | | 1,713 | 1,207 | 734 | 391 | 168 | 18 |
| By economic sector - Other (jobs) | | 3,146 | 4,742 | 5,950 | 5,447 | 6,477 | 5,524 |
| By economic sector - Pipeline (jobs) | | 359 | 300 | 212 | 135 | 73.1 | 25.5 |
| By economic sector - Professional (jobs) | | 7,480 | 10,231 | 12,528 | 11,808 | 13,627 | 12,713 |
| By economic sector - Trade (jobs) | | 5,029 | 6,771 | 8,356 | 7,814 | 9,069 | 8,202 |
| By economic sector - Utilities (jobs) | | 10,393 | 14,067 | 20,792 | 21,852 | 23,500 | 24,017 |
| By resource sector - Biomass (jobs) | | 713 | 1,073 | 378 | 942 | 2,353 | 4,127 |
| By resource sector - CO2 (jobs) | | 0 | 0 | 0 | 0 | 0 | 0 |
| By resource sector - Coal (jobs) | | 744 | 0 | 0 | 0 | 0 | 0 |
| By resource sector - Grid (jobs) | | 13,274 | 22,043 | 37,316 | 40,823 | 45,639 | 48,477 |

Table 28: *E+RE+ scenario - IMPACTS - Jobs (continued)*

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|------|--------|--------|--------|--------|--------|--------|
| By resource sector - Natural Gas (jobs) | | 3,356 | 2,861 | 2,191 | 2,199 | 1,961 | 1,505 |
| By resource sector - Nuclear (jobs) | | 2,635 | 2,593 | 2,194 | 1,452 | 673 | 0 |
| By resource sector - Oil (jobs) | | 4,312 | 3,358 | 2,300 | 1,362 | 638 | 0.022 |
| By resource sector - Solar (jobs) | | 25,915 | 36,461 | 42,583 | 34,327 | 37,671 | 33,709 |
| By resource sector - Wind (jobs) | | 13.6 | 286 | 998 | 1,651 | 2,330 | 1,258 |
| By education level - All sectors - High school diploma or less (jobs) | | 21,883 | 29,685 | 37,911 | 35,576 | 39,243 | 38,406 |
| By education level - All sectors - Associates degree or some college (jobs) | | 16,126 | 21,902 | 28,419 | 26,840 | 29,583 | 28,807 |
| By education level - All sectors - Bachelors degree (jobs) | | 10,055 | 13,251 | 16,809 | 15,794 | 17,386 | 17,004 |
| By education level - All sectors - Masters or professional degree (jobs) | | 2,505 | 3,320 | 4,199 | 3,973 | 4,411 | 4,261 |
| By education level - All sectors - Doctoral degree (jobs) | | 393 | 516 | 622 | 574 | 643 | 597 |
| Related work experience - All sectors - None (jobs) | | 7,379 | 10,005 | 12,868 | 12,169 | 13,473 | 13,146 |
| Related work experience - All sectors - Up to 1 year (jobs) | | 10,526 | 14,294 | 18,134 | 16,925 | 18,737 | 18,323 |
| Related work experience - All sectors - 1 to 4 years (jobs) | | 18,188 | 24,451 | 31,347 | 29,559 | 32,596 | 31,788 |
| Related work experience - All sectors - 4 to 10 years (jobs) | | 11,821 | 15,851 | 20,356 | 19,168 | 21,064 | 20,485 |
| Related work experience - All sectors - Over 10 years (jobs) | | 3,048 | 4,074 | 5,255 | 4,935 | 5,397 | 5,331 |
| On-the-Job Training - All sectors - None (jobs) | | 2,895 | 3,872 | 4,862 | 4,515 | 4,990 | 4,792 |
| On-the-Job Training - All sectors - Up to 1 year (jobs) | | 32,949 | 44,379 | 56,803 | 53,462 | 59,074 | 58,125 |
| On-the-Job Training - All sectors - 1 to 4 years (jobs) | | 10,889 | 14,703 | 18,985 | 17,906 | 19,655 | 19,033 |
| On-the-Job Training - All sectors - 4 to 10 years (jobs) | | 3,704 | 5,022 | 6,439 | 6,084 | 6,693 | 6,300 |
| On-the-Job Training - All sectors - Over 10 years (jobs) | | 525 | 698 | 871 | 789 | 855 | 825 |
| On-Site or In-Plant Training - All sectors - None (jobs) | | 8,390 | 11,279 | 14,299 | 13,353 | 14,741 | 14,320 |
| On-Site or In-Plant Training - All sectors - Up to 1 year (jobs) | | 29,993 | 40,405 | 51,782 | 48,761 | 53,845 | 52,910 |
| On-Site or In-Plant Training - All sectors - 1 to 4 years (jobs) | | 8,431 | 11,391 | 14,698 | 13,857 | 15,224 | 14,775 |
| On-Site or In-Plant Training - All sectors - 4 to 10 years (jobs) | | 3,709 | 4,999 | 6,395 | 6,035 | 6,629 | 6,265 |
| On-Site or In-Plant Training - All sectors - Over 10 years (jobs) | | 438 | 600 | 786 | 749 | 827 | 806 |
| Wage income - All (million \$2019) | | 2,508 | 3,387 | 4,389 | 4,198 | 4,676 | 4,629 |

Table 29: *E+RE+ scenario - PILLAR 1: Efficiency/Electrification - Overview*

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|------|------|------|------|------|------|------|
| Final energy use - Transportation (PJ) | 463 | 438 | 386 | 323 | 267 | 233 | 218 |
| Final energy use - Residential (PJ) | 158 | 150 | 141 | 129 | 119 | 115 | 113 |
| Final energy use - Commercial (PJ) | 114 | 114 | 111 | 106 | 101 | 100 | 102 |
| Final energy use - Industry (PJ) | 358 | 374 | 380 | 387 | 398 | 399 | 404 |

Table 30: *E+RE+ scenario - PILLAR 1: Efficiency/Electrification - Electricity demand*

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|------|------|------|------|------|------|------|
| Electricity distribution capital invested - Cumulative 5-yr (billion \$2018) | | 3.55 | 3.63 | 5.67 | 5.98 | 4.97 | 5.12 |

Table 31: *E+RE+ scenario - PILLAR 1: Efficiency/Electrification - Transportation*

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|-------|-------|-------|-------|-------|-------|-------|
| Vehicle stocks - LDV – EV (1000 units) | 17.4 | 382 | 746 | 2,022 | 3,298 | 4,317 | 5,336 |
| Vehicle stocks - LDV – All others (1000 units) | 4,450 | 4,237 | 4,024 | 2,933 | 1,841 | 1,042 | 242 |
| Light-duty vehicle capital costs vs. REF - Cumulative 5-yr (million \$2018) | | 856 | 2,191 | 3,557 | 5,385 | 5,864 | 5,589 |
| Public EV charging plugs - DC Fast (1000 units) | 0.1 | | 1.63 | | 7.19 | | 11.6 |
| Public EV charging plugs - L2 (1000 units) | 0.476 | | 39.1 | | 173 | | 280 |

Table 32: *E+RE+ scenario - PILLAR 1: Efficiency/Electrification - Residential*

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|------|------|------|-------|------|------|------|
| Sales of space heating units - Electric Heat Pump (%) | 37.5 | 51.9 | 80.7 | 87.2 | 87.5 | 87.4 | 87.4 |
| Sales of space heating units - Electric Resistance (%) | 25.8 | 25.3 | 10.7 | 7.34 | 7.15 | 7.29 | 7.33 |
| Sales of space heating units - Gas (%) | 30.5 | 15 | 4.16 | 1.77 | 1.69 | 1.69 | 1.68 |
| Sales of space heating units - Fossil (%) | 6.1 | 7.81 | 4.43 | 3.7 | 3.67 | 3.6 | 3.59 |
| Sales of water heating units - Electric Heat Pump (%) | 0 | 12.1 | 64.1 | 75.7 | 76.2 | 76.2 | 76.1 |
| Sales of water heating units - Electric Resistance (%) | 67.7 | 70.5 | 30.6 | 21.7 | 21.3 | 21.3 | 21.3 |
| Sales of water heating units - Gas Furnace (%) | 28.2 | 14.7 | 2.78 | 0.118 | 0 | 0 | 0 |
| Sales of water heating units - Other (%) | 4.1 | 2.65 | 2.54 | 2.53 | 2.55 | 2.56 | 2.57 |
| Sales of cooking units - Electric Resistance (%) | 82.7 | 86.4 | 97.7 | 99.9 | 100 | 100 | 100 |
| Sales of cooking units - Gas (%) | 17.3 | 13.6 | 2.33 | 0.117 | 0 | 0 | 0 |
| Residential HVAC investment in 2020s vs. REF - Cumulative 5-yr (billion \$2018) | | 3.83 | 4.21 | | | | |

Table 33: *E+RE+ scenario - PILLAR 1: Efficiency/Electrification - Commercial*

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|-------|--------|--------|-------|------|------|------|
| Sales of space heating units - Electric Heat Pump (%) | 10.1 | 27.5 | 70.6 | 83.9 | 85.2 | 85.2 | 85.2 |
| Sales of space heating units - Electric Resistance (%) | 9.29 | 8.33 | 10.3 | 12.4 | 12.9 | 12.8 | 12.8 |
| Sales of space heating units - Gas (%) | 78.5 | 60.3 | 18.3 | 3.66 | 1.98 | 1.94 | 1.94 |
| Sales of space heating units - Fossil (%) | 2.15 | 3.92 | 0.743 | 0.032 | 0 | 0 | 0 |
| Sales of water heating units - Electric Heat Pump (%) | 0.316 | 10.5 | 54.5 | 64.3 | 64.7 | 64.8 | 64.8 |
| Sales of water heating units - Electric Resistance (%) | 7.81 | 11 | 28.4 | 32.3 | 32.5 | 32.5 | 32.5 |
| Sales of water heating units - Gas (%) | 88 | 74.5 | 14.1 | 0.593 | 0 | 0 | 0 |
| Sales of water heating units - Other (%) | 3.86 | 4.03 | 2.99 | 2.74 | 2.74 | 2.73 | 2.73 |
| Sales of cooking units - Electric Resistance (%) | 32 | 46 | 79.9 | 86.5 | 86.9 | 86.9 | 86.9 |
| Sales of cooking units - Gas (%) | 68 | 54 | 20.1 | 13.5 | 13.1 | 13.1 | 13.1 |
| Commercial HVAC investment in 2020s - Cumulative 5-yr (million \$2018) | | 15,755 | 17,550 | | | | |

Table 34: *E+RE+ scenario - PILLAR 2: Clean Electricity - Generating capacity*

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--------------------------------------|-------|-------|-------|-------|-------|-------|-------|
| Installed thermal - Coal (MW) | 5,499 | 0 | 0 | 0 | 0 | 0 | 0 |
| Installed thermal - Natural gas (MW) | 6,450 | 8,486 | 8,010 | 8,486 | 5,848 | 5,850 | 9,017 |

Table 34: *E+RE+ scenario - PILLAR 2: Clean Electricity - Generating capacity (continued)*

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|-------|--------|--------|--------|--------|--------|--------|
| Installed thermal - Nuclear (MW) | 5,220 | 5,220 | 5,220 | 3,440 | 2,410 | 0 | 0 |
| Installed renewables - Rooftop PV (MW) | 353 | 569 | 805 | 1,146 | 1,626 | 2,248 | 3,044 |
| Installed renewables - Solar - Base land use assumptions (MW) | 1,471 | 16,603 | 36,164 | 57,887 | 68,763 | 80,695 | 83,683 |
| Installed renewables - Offshore Wind - Base land use assumptions (MW) | 0 | 0 | 0 | 7,318 | 14,654 | 20,148 | 26,685 |
| Installed renewables - Solar - Constrained land use assumptions (MW) | 1,486 | 15,313 | 35,726 | 57,139 | 66,870 | 75,841 | 79,620 |
| Installed renewables - Wind - Constrained land use assumptions (MW) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Installed renewables - Offshore Wind - Constrained land use assumptions (MW) | 0 | 0 | 0 | 8,233 | 16,298 | 16,298 | 28,328 |
| Capital invested - Solar PV - Base (billion \$2018) | | 20.3 | 23.4 | 24 | 11.3 | 11.7 | 2.77 |
| Capital invested - Offshore Wind - Base (billion \$2018) | | 0 | 0 | 15 | 12.7 | 8.1 | 8.19 |

Table 35: *E+RE+ scenario - PILLAR 2: Clean Electricity - Generation*

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|-------|--------|---------|---------|---------|---------|---------|
| Solar - Base land use assumptions (GWh) | 3,487 | 33,536 | 72,250 | 115,091 | 136,552 | 160,100 | 165,969 |
| Wind - Base land use assumptions (GWh) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| OffshoreWind - Base land use assumptions (GWh) | 0 | 0 | 0 | 26,149 | 52,616 | 73,446 | 98,879 |
| Solar - Constrained land use assumptions (GWh) | 6,973 | 61,832 | 142,590 | 227,013 | 265,410 | 300,816 | 315,651 |
| Wind - Constrained land use assumptions (GWh) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| OffshoreWind - Constrained land use assumptions (GWh) | 0 | 0 | 0 | 58,835 | 117,828 | 117,828 | 210,354 |

Table 36: *E+RE+ scenario - PILLAR 6: Land sinks - Forests*

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|------|------|------|------|------|------|---------|
| Carbon sink potential - Low - Accelerate regeneration (1000 tCO2e/y) | | | | | | | -158 |
| Carbon sink potential - Low - Avoid deforestation (1000 tCO2e/y) | | | | | | | -274 |
| Carbon sink potential - Low - Extend rotation length (1000 tCO2e/y) | | | | | | | -2,808 |
| Carbon sink potential - Low - Improve plantations (1000 tCO2e/y) | | | | | | | -1,420 |
| Carbon sink potential - Low - Increase retention of HWP (1000 tCO2e/y) | | | | | | | -5,902 |
| Carbon sink potential - Low - Increase trees outside forests (1000 tCO2e/y) | | | | | | | -187 |
| Carbon sink potential - Low - Reforest cropland (1000 tCO2e/y) | | | | | | | -407 |
| Carbon sink potential - Low - Reforest pasture (1000 tCO2e/y) | | | | | | | -183 |
| Carbon sink potential - Low - Restore productivity (1000 tCO2e/y) | | | | | | | -922 |
| Carbon sink potential - Low - All (not counting overlap) (1000 tCO2e/y) | | | | | | | -12,261 |
| Carbon sink potential - Mid - Accelerate regeneration (1000 tCO2e/y) | | | | | | | -236 |
| Carbon sink potential - Mid - Avoid deforestation (1000 tCO2e/y) | | | | | | | -960 |
| Carbon sink potential - Mid - Extend rotation length (1000 tCO2e/y) | | | | | | | -5,059 |

Table 36: *E+RE+ scenario - PILLAR 6: Land sinks - Forests (continued)*

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|------|------|------|------|------|------|---------|
| Carbon sink potential - Mid - Improve plantations (1000 tCO ₂ e/y) | | | | | | | -2,081 |
| Carbon sink potential - Mid - Increase retention of HWP (1000 tCO ₂ e/y) | | | | | | | -11,805 |
| Carbon sink potential - Mid - Increase trees outside forests (1000 tCO ₂ e/y) | | | | | | | -360 |
| Carbon sink potential - Mid - Reforest cropland (1000 tCO ₂ e/y) | | | | | | | -610 |
| Carbon sink potential - Mid - Reforest pasture (1000 tCO ₂ e/y) | | | | | | | -1,303 |
| Carbon sink potential - Mid - Restore productivity (1000 tCO ₂ e/y) | | | | | | | -1,829 |
| Carbon sink potential - Mid - All (not counting overlap) (1000 tCO ₂ e/y) | | | | | | | -24,243 |
| Carbon sink potential - High - Accelerate regeneration (1000 tCO ₂ e/y) | | | | | | | -315 |
| Carbon sink potential - High - Avoid deforestation (1000 tCO ₂ e/y) | | | | | | | -1,646 |
| Carbon sink potential - High - Extend rotation length (1000 tCO ₂ e/y) | | | | | | | -7,310 |
| Carbon sink potential - High - Improve plantations (1000 tCO ₂ e/y) | | | | | | | -2,791 |
| Carbon sink potential - High - Increase retention of HWP (1000 tCO ₂ e/y) | | | | | | | -17,707 |
| Carbon sink potential - High - Increase trees outside forests (1000 tCO ₂ e/y) | | | | | | | -534 |
| Carbon sink potential - High - Reforest cropland (1000 tCO ₂ e/y) | | | | | | | -813 |
| Carbon sink potential - High - Reforest pasture (1000 tCO ₂ e/y) | | | | | | | -2,422 |
| Carbon sink potential - High - All (not counting overlap) (1000 tCO ₂ e/y) | | | | | | | -36,273 |
| Carbon sink potential - High - Restore productivity (1000 tCO ₂ e/y) | | | | | | | -2,736 |
| Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares) | | | | | | | 25.7 |
| Land impacted for carbon sink potential - Low - Avoid deforestation (over 30 years) (1000 hectares) | | | | | | | 209 |
| Land impacted for carbon sink potential - Low - Extend rotation length (1000 hectares) | | | | | | | 1,428 |
| Land impacted for carbon sink potential - Low - Improve plantations (1000 hectares) | | | | | | | 514 |
| Land impacted for carbon sink potential - Low - Increase retention of HWP (1000 hectares) | | | | | | | 0 |
| Land impacted for carbon sink potential - Low - Increase trees outside forests (1000 hectares) | | | | | | | 26.7 |
| Land impacted for carbon sink potential - Low - Reforest cropland (1000 hectares) | | | | | | | 26.9 |
| Land impacted for carbon sink potential - Low - Reforest pasture (1000 hectares) | | | | | | | 11.9 |
| Land impacted for carbon sink potential - Low - Restore productivity (1000 hectares) | | | | | | | 549 |

Table 36: *E+RE+ scenario - PILLAR 6: Land sinks - Forests (continued)*

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|------|------|------|------|------|------|-------|
| Land impacted for carbon sink potential - Low - Total impacted (over 30 years) (1000 hectares) | | | | | | | 2,791 |
| Land impacted for carbon sink potential - Mid - Accelerate regeneration (1000 hectares) | | | | | | | 38.6 |
| Land impacted for carbon sink potential - Mid - Avoid deforestation (over 30 years) (1000 hectares) | | | | | | | 216 |
| Land impacted for carbon sink potential - Mid - Extend rotation length (1000 hectares) | | | | | | | 2,578 |
| Land impacted for carbon sink potential - Mid - Improve plantations (1000 hectares) | | | | | | | 774 |
| Land impacted for carbon sink potential - Mid - Increase retention of HWP (1000 hectares) | | | | | | | 0 |
| Land impacted for carbon sink potential - Mid - Increase trees outside forests (1000 hectares) | | | | | | | 38.7 |
| Land impacted for carbon sink potential - Mid - Reforest cropland (1000 hectares) | | | | | | | 40.3 |
| Land impacted for carbon sink potential - Mid - Reforest pasture (1000 hectares) | | | | | | | 86.2 |
| Land impacted for carbon sink potential - Mid - Restore productivity (1000 hectares) | | | | | | | 1,105 |
| Land impacted for carbon sink potential - Mid - Total impacted (over 30 years) (1000 hectares) | | | | | | | 4,876 |
| Land impacted for carbon sink potential - High - Accelerate regeneration (1000 hectares) | | | | | | | 51.5 |
| Land impacted for carbon sink potential - High - Avoid deforestation (over 30 years) (1000 hectares) | | | | | | | 223 |
| Land impacted for carbon sink potential - High - Extend rotation length (1000 hectares) | | | | | | | 3,727 |
| Land impacted for carbon sink potential - High - Improve plantations (1000 hectares) | | | | | | | 1,028 |
| Land impacted for carbon sink potential - High - Increase retention of HWP (1000 hectares) | | | | | | | 0 |
| Land impacted for carbon sink potential - High - Increase trees outside forests (1000 hectares) | | | | | | | 50.7 |
| Land impacted for carbon sink potential - High - Reforest cropland (1000 hectares) | | | | | | | 53.8 |
| Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares) | | | | | | | 68.8 |
| Land impacted for carbon sink potential - High - Restore productivity (1000 hectares) | | | | | | | 907 |
| Land impacted for carbon sink potential - High - Total impacted (over 30 years) (1000 hectares) | | | | | | | 6,110 |

Table 37: *E+RE+ scenario - PILLAR 6: Land sinks - Agriculture*

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|------|------|------|------|------|------|--------|
| Carbon sink potential - Moderate deployment - Corn-ethanol to energy grasses (1000 tCO ₂ e/y) | | | | | | | -81.8 |
| Carbon sink potential - Moderate deployment - Cropland measures (1000 tCO ₂ e/y) | | | | | | | -677 |
| Carbon sink potential - Moderate deployment - Permanent conservation cover (1000 tCO ₂ e/y) | | | | | | | -19.4 |
| Carbon sink potential - Moderate deployment - Total (1000 tCO ₂ e/y) | | | | | | | -778 |
| Carbon sink potential - Aggressive deployment - Corn-ethanol to energy grasses (1000 tCO ₂ e/y) | | | | | | | -81.8 |
| Carbon sink potential - Aggressive deployment - Cropland measures (1000 tCO ₂ e/y) | | | | | | | -1,291 |
| Carbon sink potential - Aggressive deployment - Permanent conservation cover (1000 tCO ₂ e/y) | | | | | | | -38.7 |
| Carbon sink potential - Aggressive deployment - Total (1000 tCO ₂ e/y) | | | | | | | -1,411 |
| Land impacted for carbon sink - Moderate deployment - Corn-ethanol to energy grasses (1000 hectares) | | | | | | | 46.8 |
| Land impacted for carbon sink - Moderate deployment - Cropland measures (1000 hectares) | | | | | | | 371 |
| Land impacted for carbon sink - Moderate deployment - Permanent conservation cover (1000 hectares) | | | | | | | 35.2 |
| Land impacted for carbon sink - Moderate deployment - Total (1000 hectares) | | | | | | | 453 |
| Land impacted for carbon sink - Aggressive deployment - Corn-ethanol to energy grasses (1000 hectares) | | | | | | | 46.8 |
| Land impacted for carbon sink - Aggressive deployment - Cropland measures (1000 hectares) | | | | | | | 707 |
| Land impacted for carbon sink - Aggressive deployment - Permanent conservation cover (1000 hectares) | | | | | | | 70.4 |
| Land impacted for carbon sink - Aggressive deployment - Total (1000 hectares) | | | | | | | 824 |

Table 38: *E+RE- scenario - IMPACTS - Health*

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|------|------|-------|-------|-------|-------|-------|
| Premature deaths from air pollution - Fuel Comb - Electric Generation - Coal (deaths) | | 30.4 | 0.049 | 0.046 | 0.036 | 0.025 | 0.002 |
| Premature deaths from air pollution - Fuel Comb - Electric Generation - Natural Gas (deaths) | | 22.8 | 18.9 | 18.1 | 13.9 | 4.5 | 1.45 |
| Premature deaths from air pollution - Mobile - On-Road (deaths) | | 117 | 110 | 84.4 | 49.2 | 22.6 | 8.97 |
| Premature deaths from air pollution - Gas Stations (deaths) | | 15.4 | 14.2 | 10.8 | 6.43 | 3.13 | 1.47 |

Table 38: E+RE- scenario - IMPACTS - Health (continued)

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|------|-------|-------|-------|-------|-------|-------|
| Premature deaths from air pollution - Fuel Comb - Residential - Natural Gas (deaths) | | 10.2 | 8.38 | 5.66 | 3.2 | 1.61 | 0.781 |
| Premature deaths from air pollution - Fuel Comb - Residential - Oil (deaths) | | 1.82 | 1.48 | 1.02 | 0.612 | 0.302 | 0.135 |
| Premature deaths from air pollution - Fuel Comb - Residential - Other (deaths) | | 2.11 | 1.9 | 1.49 | 1.02 | 0.602 | 0.339 |
| Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Coal (deaths) | | 1.58 | 1.52 | 1.46 | 1.4 | 1.33 | 1.25 |
| Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Natural Gas (deaths) | | 8.36 | 7.38 | 5.45 | 3.45 | 2.12 | 1.38 |
| Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Oil (deaths) | | 1.5 | 1.25 | 0.971 | 0.698 | 0.486 | 0.321 |
| Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Other (deaths) | | 1.47 | 1.27 | 1.06 | 0.843 | 0.63 | 0.422 |
| Premature deaths from air pollution - Industrial Processes - Coal Mining (deaths) | | 0.567 | 0.316 | 0.317 | 0.315 | 0.322 | 0.299 |
| Premature deaths from air pollution - Industrial Processes - Oil & Gas Production (deaths) | | 25.1 | 24.4 | 24.1 | 20.8 | 17.6 | 13.2 |
| Monetary damages from air pollution - Fuel Comb - Electric Generation - Coal (million \$2019) | | 269 | 0.437 | 0.407 | 0.323 | 0.225 | 0.019 |
| Monetary damages from air pollution - Fuel Comb - Electric Generation - Natural Gas (million \$2019) | | 202 | 168 | 161 | 123 | 39.9 | 12.9 |
| Monetary damages from air pollution - Mobile - On-Road (million \$2019) | | 1,041 | 979 | 750 | 437 | 201 | 79.7 |
| Monetary damages from air pollution - Gas Stations (million \$2019) | | 136 | 126 | 95.5 | 56.9 | 27.7 | 13 |
| Monetary damages from air pollution - Fuel Comb - Residential - Natural Gas (million \$2019) | | 90.7 | 74.2 | 50.2 | 28.3 | 14.3 | 6.92 |
| Monetary damages from air pollution - Fuel Comb - Residential - Oil (million \$2019) | | 16.1 | 13.1 | 9.05 | 5.43 | 2.68 | 1.2 |
| Monetary damages from air pollution - Fuel Comb - Residential - Other (million \$2019) | | 18.7 | 16.9 | 13.2 | 9.03 | 5.33 | 3.01 |
| Monetary damages from air pollution - Fuel Comb - Comm/Institutional - Coal (million \$2019) | | 14 | 13.5 | 12.9 | 12.4 | 11.7 | 11 |
| Monetary damages from air pollution - Fuel Comb - Comm/Institutional - Natural Gas (million \$2019) | | 74 | 65.3 | 48.2 | 30.5 | 18.8 | 12.2 |
| Monetary damages from air pollution - Fuel Comb - Comm/Institutional - Oil (million \$2019) | | 13.3 | 11.1 | 8.59 | 6.18 | 4.31 | 2.84 |
| Monetary damages from air pollution - Fuel Comb - Comm/Institutional - Other (million \$2019) | | 13 | 11.2 | 9.36 | 7.46 | 5.58 | 3.74 |
| Monetary damages from air pollution - Industrial Processes - Coal Mining (million \$2019) | | 5 | 2.79 | 2.8 | 2.78 | 2.84 | 2.64 |

Table 38: *E+RE- scenario - IMPACTS - Health (continued)*

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|------|------|------|------|------|------|------|
| Monetary damages from air pollution - Industrial Processes - Oil & Gas Production (million \$2019) | | 222 | 217 | 214 | 185 | 156 | 117 |

Table 39: *E+RE- scenario - IMPACTS - Jobs*

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|------|--------|--------|--------|--------|--------|--------|
| By economic sector - Agriculture (jobs) | | 208 | 298 | 99.8 | 397 | 818 | 944 |
| By economic sector - Construction (jobs) | | 9,003 | 10,749 | 16,938 | 14,615 | 16,772 | 15,873 |
| By economic sector - Manufacturing (jobs) | | 2,713 | 2,925 | 2,947 | 3,220 | 3,664 | 3,325 |
| By economic sector - Mining (jobs) | | 1,740 | 1,258 | 847 | 539 | 340 | 222 |
| By economic sector - Other (jobs) | | 1,261 | 1,692 | 3,029 | 2,465 | 3,062 | 2,826 |
| By economic sector - Pipeline (jobs) | | 376 | 327 | 510 | 351 | 400 | 430 |
| By economic sector - Professional (jobs) | | 4,160 | 4,706 | 6,719 | 7,504 | 8,904 | 8,721 |
| By economic sector - Trade (jobs) | | 2,872 | 3,204 | 4,595 | 4,410 | 5,209 | 5,000 |
| By economic sector - Utilities (jobs) | | 7,876 | 9,184 | 12,807 | 20,160 | 21,337 | 22,229 |
| By resource sector - Biomass (jobs) | | 729 | 765 | 342 | 1,482 | 3,205 | 3,923 |
| By resource sector - CO2 (jobs) | | 1.65 | 5.55 | 1,863 | 963 | 1,816 | 2,392 |
| By resource sector - Coal (jobs) | | 744 | 0 | 0 | 0 | 0 | 0 |
| By resource sector - Grid (jobs) | | 8,547 | 11,584 | 18,084 | 21,094 | 24,478 | 25,563 |
| By resource sector - Natural Gas (jobs) | | 3,315 | 3,678 | 2,833 | 3,249 | 3,365 | 2,710 |
| By resource sector - Nuclear (jobs) | | 2,635 | 2,593 | 2,555 | 10,720 | 9,394 | 9,957 |
| By resource sector - Oil (jobs) | | 4,310 | 3,403 | 2,397 | 1,583 | 1,054 | 743 |
| By resource sector - Solar (jobs) | | 9,864 | 12,233 | 20,409 | 14,544 | 17,131 | 14,254 |
| By resource sector - Wind (jobs) | | 65 | 82.2 | 8 | 23.8 | 63.4 | 27 |
| By education level - All sectors - High school diploma or less (jobs) | | 12,698 | 14,604 | 20,749 | 22,174 | 25,251 | 24,823 |
| By education level - All sectors - Associates degree or some college (jobs) | | 9,409 | 10,820 | 15,611 | 16,833 | 19,043 | 18,694 |
| By education level - All sectors - Bachelors degree (jobs) | | 6,305 | 6,936 | 9,417 | 11,320 | 12,512 | 12,381 |
| By education level - All sectors - Masters or professional degree (jobs) | | 1,563 | 1,728 | 2,364 | 2,905 | 3,222 | 3,201 |
| By education level - All sectors - Doctoral degree (jobs) | | 234 | 256 | 350 | 429 | 479 | 471 |
| Related work experience - All sectors - None (jobs) | | 4,349 | 4,989 | 7,107 | 7,721 | 8,789 | 8,660 |
| Related work experience - All sectors - Up to 1 year (jobs) | | 6,050 | 6,943 | 9,842 | 10,671 | 12,156 | 11,944 |
| Related work experience - All sectors - 1 to 4 years (jobs) | | 10,902 | 12,345 | 17,348 | 19,368 | 21,780 | 21,458 |
| Related work experience - All sectors - 4 to 10 years (jobs) | | 7,055 | 7,985 | 11,299 | 12,564 | 14,084 | 13,860 |
| Related work experience - All sectors - Over 10 years (jobs) | | 1,854 | 2,082 | 2,895 | 3,337 | 3,699 | 3,649 |
| On-the-Job Training - All sectors - None (jobs) | | 1,699 | 1,912 | 2,689 | 3,027 | 3,387 | 3,325 |
| On-the-Job Training - All sectors - Up to 1 year (jobs) | | 19,754 | 22,363 | 31,184 | 35,002 | 39,502 | 38,955 |
| On-the-Job Training - All sectors - 1 to 4 years (jobs) | | 6,376 | 7,308 | 10,524 | 11,406 | 12,827 | 12,603 |
| On-the-Job Training - All sectors - 4 to 10 years (jobs) | | 2,083 | 2,426 | 3,620 | 3,718 | 4,228 | 4,141 |
| On-the-Job Training - All sectors - Over 10 years (jobs) | | 297 | 335 | 475 | 509 | 563 | 545 |
| On-Site or In-Plant Training - All sectors - None (jobs) | | 4,940 | 5,592 | 7,864 | 8,782 | 9,883 | 9,703 |
| On-Site or In-Plant Training - All sectors - Up to 1 year (jobs) | | 17,955 | 20,349 | 28,460 | 31,864 | 35,936 | 35,442 |

Table 39: *E+RE- scenario - IMPACTS - Jobs (continued)*

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|------|-------|-------|-------|-------|-------|-------|
| On-Site or In-Plant Training - All sectors - 1 to 4 years (jobs) | | 4,939 | 5,659 | 8,126 | 8,795 | 9,905 | 9,732 |
| On-Site or In-Plant Training - All sectors - 4 to 10 years (jobs) | | 2,122 | 2,449 | 3,608 | 3,770 | 4,268 | 4,186 |
| On-Site or In-Plant Training - All sectors - Over 10 years (jobs) | | 253 | 295 | 433 | 449 | 516 | 507 |
| Wage income - All (million \$2019) | | 1,534 | 1,746 | 2,456 | 2,883 | 3,261 | 3,281 |

Table 40: *E+RE- scenario - PILLAR 1: Efficiency/Electrification - Overview*

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|------|------|------|------|------|------|------|
| Final energy use - Transportation (PJ) | 463 | 438 | 386 | 323 | 267 | 233 | 218 |
| Final energy use - Residential (PJ) | 158 | 150 | 141 | 129 | 119 | 115 | 113 |
| Final energy use - Commercial (PJ) | 114 | 114 | 111 | 106 | 101 | 100 | 102 |
| Final energy use - Industry (PJ) | 358 | 374 | 380 | 387 | 398 | 399 | 404 |

Table 41: *E+RE- scenario - PILLAR 1: Efficiency/Electrification - Electricity demand*

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|------|------|------|------|------|------|------|
| Electricity distribution capital invested - Cumulative 5-yr (billion \$2018) | | 3.55 | 3.63 | 5.67 | 5.98 | 4.97 | 5.12 |

Table 42: *E+RE- scenario - PILLAR 1: Efficiency/Electrification - Transportation*

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|-------|-------|-------|-------|-------|-------|-------|
| Vehicle stocks - LDV – EV (1000 units) | 17.4 | 382 | 746 | 2,022 | 3,298 | 4,317 | 5,336 |
| Vehicle stocks - LDV – All others (1000 units) | 4,450 | 4,237 | 4,024 | 2,933 | 1,841 | 1,042 | 242 |
| Light-duty vehicle capital costs vs. REF - Cumulative 5-yr (million \$2018) | | 856 | 2,191 | 3,557 | 5,385 | 5,864 | 5,589 |
| Public EV charging plugs - DC Fast (1000 units) | 0.1 | | 1.63 | | 7.19 | | 11.6 |
| Public EV charging plugs - L2 (1000 units) | 0.476 | | 39.1 | | 173 | | 280 |

Table 43: *E+RE- scenario - PILLAR 1: Efficiency/Electrification - Residential*

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|------|------|------|-------|------|------|------|
| Sales of space heating units - Electric Heat Pump (%) | 37.5 | 51.9 | 80.7 | 87.2 | 87.5 | 87.4 | 87.4 |
| Sales of space heating units - Electric Resistance (%) | 25.8 | 25.3 | 10.7 | 7.34 | 7.15 | 7.29 | 7.33 |
| Sales of space heating units - Gas (%) | 30.5 | 15 | 4.16 | 1.77 | 1.69 | 1.69 | 1.68 |
| Sales of space heating units - Fossil (%) | 6.1 | 7.81 | 4.43 | 3.7 | 3.67 | 3.6 | 3.59 |
| Sales of water heating units - Electric Heat Pump (%) | 0 | 12.1 | 64.1 | 75.7 | 76.2 | 76.2 | 76.1 |
| Sales of water heating units - Electric Resistance (%) | 67.7 | 70.5 | 30.6 | 21.7 | 21.3 | 21.3 | 21.3 |
| Sales of water heating units - Gas Furnace (%) | 28.2 | 14.7 | 2.78 | 0.118 | 0 | 0 | 0 |
| Sales of water heating units - Other (%) | 4.1 | 2.65 | 2.54 | 2.53 | 2.55 | 2.56 | 2.57 |
| Sales of cooking units - Electric Resistance (%) | 82.7 | 86.4 | 97.7 | 99.9 | 100 | 100 | 100 |
| Sales of cooking units - Gas (%) | 17.3 | 13.6 | 2.33 | 0.117 | 0 | 0 | 0 |
| Residential HVAC investment in 2020s vs. REF - Cumulative 5-yr (billion \$2018) | | 3.83 | 4.21 | | | | |

Table 44: *E+RE- scenario - PILLAR 1: Efficiency/Electrification - Commercial*

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|-------|--------|--------|-------|------|------|------|
| Sales of space heating units - Electric Heat Pump (%) | 10.1 | 27.5 | 70.6 | 83.9 | 85.2 | 85.2 | 85.2 |
| Sales of space heating units - Electric Resistance (%) | 9.29 | 8.33 | 10.3 | 12.4 | 12.9 | 12.8 | 12.8 |
| Sales of space heating units - Gas (%) | 78.5 | 60.3 | 18.3 | 3.66 | 1.98 | 1.94 | 1.94 |
| Sales of space heating units - Fossil (%) | 2.15 | 3.92 | 0.743 | 0.032 | 0 | 0 | 0 |
| Sales of water heating units - Electric Heat Pump (%) | 0.316 | 10.5 | 54.5 | 64.3 | 64.7 | 64.8 | 64.8 |
| Sales of water heating units - Electric Resistance (%) | 7.81 | 11 | 28.4 | 32.3 | 32.5 | 32.5 | 32.5 |
| Sales of water heating units - Gas (%) | 88 | 74.5 | 14.1 | 0.593 | 0 | 0 | 0 |
| Sales of water heating units - Other (%) | 3.86 | 4.03 | 2.99 | 2.74 | 2.74 | 2.73 | 2.73 |
| Sales of cooking units - Electric Resistance (%) | 32 | 46 | 79.9 | 86.5 | 86.9 | 86.9 | 86.9 |
| Sales of cooking units - Gas (%) | 68 | 54 | 20.1 | 13.5 | 13.1 | 13.1 | 13.1 |
| Commercial HVAC investment in 2020s - Cumulative 5-yr (million \$2018) | | 15,755 | 17,550 | | | | |

Table 45: *E+RE- scenario - PILLAR 2: Clean Electricity - Generating capacity*

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|-------|-------|--------|--------|--------|--------|--------|
| Installed thermal - Coal (MW) | 5,499 | 0 | 0 | 0 | 0 | 0 | 0 |
| Installed thermal - Natural gas (MW) | 6,485 | 6,487 | 8,026 | 8,032 | 9,312 | 9,770 | 10,893 |
| Installed thermal - Nuclear (MW) | 5,220 | 5,220 | 5,220 | 5,222 | 7,094 | 9,709 | 12,099 |
| Installed renewables - Rooftop PV (MW) | 353 | 569 | 805 | 1,146 | 1,626 | 2,248 | 3,044 |
| Installed renewables - Solar - Base land use assumptions (MW) | 1,471 | 7,495 | 14,451 | 26,864 | 32,648 | 40,459 | 41,102 |
| Installed renewables - Solar - Constrained land use assumptions (MW) | 1,486 | 9,861 | 15,524 | 30,822 | 36,745 | 44,553 | 45,091 |
| Installed renewables - Wind - Constrained land use assumptions (MW) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Installed renewables - Offshore Wind - Constrained land use assumptions (MW) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Capital invested - Solar PV - Base (billion \$2018) | | 8.07 | 8.33 | 13.7 | 6.01 | 7.66 | 0.596 |
| Capital invested - Solar PV - Constrained (billion \$2018) | | 11.2 | 6.78 | 16.9 | 6.15 | 7.66 | 0.498 |

Table 46: *E+RE- scenario - PILLAR 2: Clean Electricity - Generation*

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|-------|--------|--------|--------|--------|--------|--------|
| Solar - Base land use assumptions (GWh) | 3,487 | 15,460 | 29,258 | 53,860 | 65,319 | 80,718 | 81,989 |
| Wind - Base land use assumptions (GWh) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| OffshoreWind - Base land use assumptions (GWh) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Solar - Constrained land use assumptions (GWh) | 3,487 | 20,088 | 31,297 | 61,561 | 73,246 | 88,648 | 89,707 |
| Wind - Constrained land use assumptions (GWh) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| OffshoreWind - Constrained land use assumptions (GWh) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

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

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|------|------|------|------|------|------|------|
| Carbon sink potential - Low - Accelerate regeneration (1000 tCO ₂ e/y) | | | | | | | -158 |
| Carbon sink potential - Low - Avoid deforestation (1000 tCO ₂ e/y) | | | | | | | -274 |

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

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|------|------|------|------|------|------|---------|
| Carbon sink potential - Low - Extend rotation length (1000 tCO2e/y) | | | | | | | -2,808 |
| Carbon sink potential - Low - Improve plantations (1000 tCO2e/y) | | | | | | | -1,420 |
| Carbon sink potential - Low - Increase retention of HWP (1000 tCO2e/y) | | | | | | | -5,902 |
| Carbon sink potential - Low - Increase trees outside forests (1000 tCO2e/y) | | | | | | | -187 |
| Carbon sink potential - Low - Reforest cropland (1000 tCO2e/y) | | | | | | | -407 |
| Carbon sink potential - Low - Reforest pasture (1000 tCO2e/y) | | | | | | | -183 |
| Carbon sink potential - Low - Restore productivity (1000 tCO2e/y) | | | | | | | -922 |
| Carbon sink potential - Low - All (not counting overlap) (1000 tCO2e/y) | | | | | | | -12,261 |
| Carbon sink potential - Mid - Accelerate regeneration (1000 tCO2e/y) | | | | | | | -236 |
| Carbon sink potential - Mid - Avoid deforestation (1000 tCO2e/y) | | | | | | | -960 |
| Carbon sink potential - Mid - Extend rotation length (1000 tCO2e/y) | | | | | | | -5,059 |
| Carbon sink potential - Mid - Improve plantations (1000 tCO2e/y) | | | | | | | -2,081 |
| Carbon sink potential - Mid - Increase retention of HWP (1000 tCO2e/y) | | | | | | | -11,805 |
| Carbon sink potential - Mid - Increase trees outside forests (1000 tCO2e/y) | | | | | | | -360 |
| Carbon sink potential - Mid - Reforest cropland (1000 tCO2e/y) | | | | | | | -610 |
| Carbon sink potential - Mid - Reforest pasture (1000 tCO2e/y) | | | | | | | -1,303 |
| Carbon sink potential - Mid - Restore productivity (1000 tCO2e/y) | | | | | | | -1,829 |
| Carbon sink potential - Mid - All (not counting overlap) (1000 tCO2e/y) | | | | | | | -24,243 |
| Carbon sink potential - High - Accelerate regeneration (1000 tCO2e/y) | | | | | | | -315 |
| Carbon sink potential - High - Avoid deforestation (1000 tCO2e/y) | | | | | | | -1,646 |
| Carbon sink potential - High - Extend rotation length (1000 tCO2e/y) | | | | | | | -7,310 |
| Carbon sink potential - High - Improve plantations (1000 tCO2e/y) | | | | | | | -2,791 |
| Carbon sink potential - High - Increase retention of HWP (1000 tCO2e/y) | | | | | | | -17,707 |
| Carbon sink potential - High - Increase trees outside forests (1000 tCO2e/y) | | | | | | | -534 |
| Carbon sink potential - High - Reforest cropland (1000 tCO2e/y) | | | | | | | -813 |
| Carbon sink potential - High - Reforest pasture (1000 tCO2e/y) | | | | | | | -2,422 |
| Carbon sink potential - High - All (not counting overlap) (1000 tCO2e/y) | | | | | | | -36,273 |
| Carbon sink potential - High - Restore productivity (1000 tCO2e/y) | | | | | | | -2,736 |
| Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares) | | | | | | | 25.7 |

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

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|------|------|------|------|------|------|-------|
| Land impacted for carbon sink potential - Low - Avoid deforestation (over 30 years) (1000 hectares) | | | | | | | 209 |
| Land impacted for carbon sink potential - Low - Extend rotation length (1000 hectares) | | | | | | | 1,428 |
| Land impacted for carbon sink potential - Low - Improve plantations (1000 hectares) | | | | | | | 514 |
| Land impacted for carbon sink potential - Low - Increase retention of HWP (1000 hectares) | | | | | | | 0 |
| Land impacted for carbon sink potential - Low - Increase trees outside forests (1000 hectares) | | | | | | | 26.7 |
| Land impacted for carbon sink potential - Low - Reforest cropland (1000 hectares) | | | | | | | 26.9 |
| Land impacted for carbon sink potential - Low - Reforest pasture (1000 hectares) | | | | | | | 11.9 |
| Land impacted for carbon sink potential - Low - Restore productivity (1000 hectares) | | | | | | | 549 |
| Land impacted for carbon sink potential - Low - Total impacted (over 30 years) (1000 hectares) | | | | | | | 2,791 |
| Land impacted for carbon sink potential - Mid - Accelerate regeneration (1000 hectares) | | | | | | | 38.6 |
| Land impacted for carbon sink potential - Mid - Avoid deforestation (over 30 years) (1000 hectares) | | | | | | | 216 |
| Land impacted for carbon sink potential - Mid - Extend rotation length (1000 hectares) | | | | | | | 2,578 |
| Land impacted for carbon sink potential - Mid - Improve plantations (1000 hectares) | | | | | | | 774 |
| Land impacted for carbon sink potential - Mid - Increase retention of HWP (1000 hectares) | | | | | | | 0 |
| Land impacted for carbon sink potential - Mid - Increase trees outside forests (1000 hectares) | | | | | | | 38.7 |
| Land impacted for carbon sink potential - Mid - Reforest cropland (1000 hectares) | | | | | | | 40.3 |
| Land impacted for carbon sink potential - Mid - Reforest pasture (1000 hectares) | | | | | | | 86.2 |
| Land impacted for carbon sink potential - Mid - Restore productivity (1000 hectares) | | | | | | | 1,105 |
| Land impacted for carbon sink potential - Mid - Total impacted (over 30 years) (1000 hectares) | | | | | | | 4,876 |
| Land impacted for carbon sink potential - High - Accelerate regeneration (1000 hectares) | | | | | | | 51.5 |
| Land impacted for carbon sink potential - High - Avoid deforestation (over 30 years) (1000 hectares) | | | | | | | 223 |
| Land impacted for carbon sink potential - High - Extend rotation length (1000 hectares) | | | | | | | 3,727 |

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

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|------|------|------|------|------|------|-------|
| Land impacted for carbon sink potential - High - Improve plantations (1000 hectares) | | | | | | | 1,028 |
| Land impacted for carbon sink potential - High - Increase retention of HWP (1000 hectares) | | | | | | | 0 |
| Land impacted for carbon sink potential - High - Increase trees outside forests (1000 hectares) | | | | | | | 50.7 |
| Land impacted for carbon sink potential - High - Reforest cropland (1000 hectares) | | | | | | | 53.8 |
| Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares) | | | | | | | 68.8 |
| Land impacted for carbon sink potential - High - Restore productivity (1000 hectares) | | | | | | | 907 |
| Land impacted for carbon sink potential - High - Total impacted (over 30 years) (1000 hectares) | | | | | | | 6,110 |

Table 48: *E+RE- scenario - PILLAR 6: Land sinks - Agriculture*

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|------|------|------|------|------|------|--------|
| Carbon sink potential - Moderate deployment - Corn-ethanol to energy grasses (1000 tCO ₂ e/y) | | | | | | | -81.8 |
| Carbon sink potential - Moderate deployment - Cropland measures (1000 tCO ₂ e/y) | | | | | | | -677 |
| Carbon sink potential - Moderate deployment - Permanent conservation cover (1000 tCO ₂ e/y) | | | | | | | -19.4 |
| Carbon sink potential - Moderate deployment - Total (1000 tCO ₂ e/y) | | | | | | | -778 |
| Carbon sink potential - Aggressive deployment - Corn-ethanol to energy grasses (1000 tCO ₂ e/y) | | | | | | | -81.8 |
| Carbon sink potential - Aggressive deployment - Cropland measures (1000 tCO ₂ e/y) | | | | | | | -1,291 |
| Carbon sink potential - Aggressive deployment - Permanent conservation cover (1000 tCO ₂ e/y) | | | | | | | -38.7 |
| Carbon sink potential - Aggressive deployment - Total (1000 tCO ₂ e/y) | | | | | | | -1,411 |
| Land impacted for carbon sink - Moderate deployment - Corn-ethanol to energy grasses (1000 hectares) | | | | | | | 46.8 |
| Land impacted for carbon sink - Moderate deployment - Cropland measures (1000 hectares) | | | | | | | 371 |
| Land impacted for carbon sink - Moderate deployment - Permanent conservation cover (1000 hectares) | | | | | | | 35.2 |
| Land impacted for carbon sink - Moderate deployment - Total (1000 hectares) | | | | | | | 453 |
| Land impacted for carbon sink - Aggressive deployment - Corn-ethanol to energy grasses (1000 hectares) | | | | | | | 46.8 |

Table 48: *E+RE- scenario - PILLAR 6: Land sinks - Agriculture (continued)*

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|------|------|------|------|------|------|------|
| Land impacted for carbon sink - Aggressive deployment - Cropland measures (1000 hectares) | | | | | | | 707 |
| Land impacted for carbon sink - Aggressive deployment - Permanent conservation cover (1000 hectares) | | | | | | | 70.4 |
| Land impacted for carbon sink - Aggressive deployment - Total (1000 hectares) | | | | | | | 824 |

Table 49: *E-B+ scenario - IMPACTS - Health*

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|------|-------|-------|-------|-------|-------|-------|
| Premature deaths from air pollution - Fuel Comb - Electric Generation - Coal (deaths) | | 30.4 | 0.049 | 0.046 | 0.036 | 0.025 | 0.002 |
| Premature deaths from air pollution - Fuel Comb - Electric Generation - Natural Gas (deaths) | | 21.8 | 14.4 | 6.94 | 4.27 | 2.24 | 0.928 |
| Premature deaths from air pollution - Mobile - On-Road (deaths) | | 119 | 121 | 119 | 108 | 86.8 | 60.1 |
| Premature deaths from air pollution - Gas Stations (deaths) | | 15.7 | 16 | 15.5 | 14 | 11.2 | 7.83 |
| Premature deaths from air pollution - Fuel Comb - Residential - Natural Gas (deaths) | | 10.3 | 9.4 | 8.34 | 6.91 | 5.21 | 3.52 |
| Premature deaths from air pollution - Fuel Comb - Residential - Oil (deaths) | | 1.85 | 1.76 | 1.67 | 1.46 | 1.11 | 0.74 |
| Premature deaths from air pollution - Fuel Comb - Residential - Other (deaths) | | 2.14 | 2.15 | 2.14 | 1.98 | 1.62 | 1.2 |
| Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Coal (deaths) | | 1.58 | 1.52 | 1.46 | 1.4 | 1.33 | 1.25 |
| Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Natural Gas (deaths) | | 8.43 | 8.39 | 8.1 | 7.2 | 5.81 | 4.32 |
| Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Oil (deaths) | | 1.51 | 1.38 | 1.25 | 1.08 | 0.911 | 0.742 |
| Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Other (deaths) | | 1.47 | 1.36 | 1.24 | 1.11 | 0.986 | 0.861 |
| Premature deaths from air pollution - Industrial Processes - Coal Mining (deaths) | | 0.613 | 0.317 | 0.32 | 0.32 | 0.327 | 0.324 |
| Premature deaths from air pollution - Industrial Processes - Oil & Gas Production (deaths) | | 24.7 | 22.4 | 19.3 | 16.8 | 14.9 | 10.6 |
| Monetary damages from air pollution - Fuel Comb - Electric Generation - Coal (million \$2019) | | 269 | 0.437 | 0.407 | 0.323 | 0.225 | 0.019 |
| Monetary damages from air pollution - Fuel Comb - Electric Generation - Natural Gas (million \$2019) | | 193 | 127 | 61.5 | 37.8 | 19.9 | 8.22 |
| Monetary damages from air pollution - Mobile - On-Road (million \$2019) | | 1,058 | 1,078 | 1,057 | 961 | 772 | 534 |
| Monetary damages from air pollution - Gas Stations (million \$2019) | | 139 | 141 | 138 | 124 | 99.6 | 69.4 |
| Monetary damages from air pollution - Fuel Comb - Residential - Natural Gas (million \$2019) | | 91.5 | 83.3 | 73.9 | 61.3 | 46.2 | 31.2 |

Table 49: E-B+ scenario - IMPACTS - Health (continued)

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|------|------|------|------|------|------|------|
| Monetary damages from air pollution - Fuel Comb - Residential - Oil (million \$2019) | | 16.4 | 15.6 | 14.8 | 12.9 | 9.87 | 6.56 |
| Monetary damages from air pollution - Fuel Comb - Residential - Other (million \$2019) | | 19 | 19.1 | 19 | 17.5 | 14.3 | 10.7 |
| Monetary damages from air pollution - Fuel Comb - Comm/Institutional - Coal (million \$2019) | | 14 | 13.5 | 12.9 | 12.4 | 11.7 | 11 |
| Monetary damages from air pollution - Fuel Comb - Comm/Institutional - Natural Gas (million \$2019) | | 74.6 | 74.3 | 71.7 | 63.7 | 51.4 | 38.2 |
| Monetary damages from air pollution - Fuel Comb - Comm/Institutional - Oil (million \$2019) | | 13.4 | 12.2 | 11.1 | 9.6 | 8.06 | 6.57 |
| Monetary damages from air pollution - Fuel Comb - Comm/Institutional - Other (million \$2019) | | 13 | 12 | 11 | 9.86 | 8.73 | 7.62 |
| Monetary damages from air pollution - Industrial Processes - Coal Mining (million \$2019) | | 5.41 | 2.8 | 2.82 | 2.83 | 2.88 | 2.86 |
| Monetary damages from air pollution - Industrial Processes - Oil & Gas Production (million \$2019) | | 219 | 199 | 172 | 150 | 132 | 94.3 |

Table 50: E-B+ scenario - IMPACTS - Jobs

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|------|-------|--------|--------|--------|--------|--------|
| By economic sector - Agriculture (jobs) | | 203 | 284 | 106 | 350 | 620 | 1,001 |
| By economic sector - Construction (jobs) | | 4,824 | 30,146 | 18,385 | 18,604 | 20,779 | 23,696 |
| By economic sector - Manufacturing (jobs) | | 3,035 | 5,536 | 4,409 | 4,009 | 5,544 | 6,204 |
| By economic sector - Mining (jobs) | | 1,739 | 1,294 | 964 | 721 | 474 | 254 |
| By economic sector - Other (jobs) | | 433 | 5,979 | 3,239 | 3,579 | 3,993 | 5,396 |
| By economic sector - Pipeline (jobs) | | 366 | 309 | 466 | 331 | 373 | 378 |
| By economic sector - Professional (jobs) | | 2,826 | 11,768 | 7,378 | 8,247 | 9,709 | 11,923 |
| By economic sector - Trade (jobs) | | 1,995 | 8,049 | 5,080 | 5,557 | 6,316 | 7,824 |
| By economic sector - Utilities (jobs) | | 7,102 | 13,304 | 14,328 | 14,913 | 18,419 | 18,660 |
| By resource sector - Biomass (jobs) | | 808 | 765 | 360 | 1,470 | 2,870 | 4,722 |
| By resource sector - CO2 (jobs) | | 1.63 | 4.77 | 1,692 | 876 | 1,650 | 2,172 |
| By resource sector - Coal (jobs) | | 744 | 0 | 0 | 0 | 0 | 0 |
| By resource sector - Grid (jobs) | | 6,974 | 20,010 | 21,799 | 24,261 | 31,816 | 32,925 |
| By resource sector - Natural Gas (jobs) | | 3,412 | 2,935 | 2,350 | 2,178 | 1,933 | 1,102 |
| By resource sector - Nuclear (jobs) | | 2,635 | 2,593 | 2,552 | 2,336 | 1,879 | 1,604 |
| By resource sector - Oil (jobs) | | 4,364 | 3,667 | 3,089 | 2,601 | 1,899 | 1,100 |
| By resource sector - Solar (jobs) | | 3,570 | 46,468 | 22,392 | 22,314 | 22,979 | 30,895 |
| By resource sector - Wind (jobs) | | 16.2 | 228 | 125 | 275 | 1,201 | 813 |
| By education level - All sectors - High school diploma or less (jobs) | | 9,258 | 33,265 | 23,291 | 24,088 | 28,365 | 32,274 |
| By education level - All sectors - Associates degree or some college (jobs) | | 6,918 | 24,469 | 17,472 | 18,040 | 21,269 | 24,118 |
| By education level - All sectors - Bachelors degree (jobs) | | 4,963 | 14,664 | 10,575 | 10,992 | 12,867 | 14,640 |
| By education level - All sectors - Masters or professional degree (jobs) | | 1,213 | 3,682 | 2,635 | 2,778 | 3,254 | 3,741 |
| By education level - All sectors - Doctoral degree (jobs) | | 171 | 591 | 384 | 412 | 472 | 562 |
| Related work experience - All sectors - None (jobs) | | 3,219 | 11,170 | 7,954 | 8,266 | 9,758 | 11,126 |

Table 50: *E-B+ scenario - IMPACTS - Jobs (continued)*

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|------|--------|--------|--------|--------|--------|--------|
| Related work experience - All sectors - Up to 1 year (jobs) | | 4,378 | 16,107 | 11,049 | 11,483 | 13,506 | 15,555 |
| Related work experience - All sectors - 1 to 4 years (jobs) | | 8,207 | 27,224 | 19,449 | 20,161 | 23,698 | 26,902 |
| Related work experience - All sectors - 4 to 10 years (jobs) | | 5,291 | 17,663 | 12,642 | 13,047 | 15,317 | 17,311 |
| Related work experience - All sectors - Over 10 years (jobs) | | 1,430 | 4,506 | 3,264 | 3,354 | 3,948 | 4,442 |
| On-the-Job Training - All sectors - None (jobs) | | 1,247 | 4,387 | 2,999 | 3,116 | 3,617 | 4,178 |
| On-the-Job Training - All sectors - Up to 1 year (jobs) | | 14,955 | 49,384 | 35,095 | 36,469 | 43,023 | 49,094 |
| On-the-Job Training - All sectors - 1 to 4 years (jobs) | | 4,677 | 16,421 | 11,747 | 12,083 | 14,185 | 15,969 |
| On-the-Job Training - All sectors - 4 to 10 years (jobs) | | 1,431 | 5,681 | 3,984 | 4,107 | 4,787 | 5,393 |
| On-the-Job Training - All sectors - Over 10 years (jobs) | | 213 | 798 | 531 | 536 | 615 | 701 |
| On-Site or In-Plant Training - All sectors - None (jobs) | | 3,661 | 12,673 | 8,800 | 9,120 | 10,674 | 12,244 |
| On-Site or In-Plant Training - All sectors - Up to 1 year (jobs) | | 13,562 | 44,969 | 32,011 | 33,238 | 39,196 | 44,660 |
| On-Site or In-Plant Training - All sectors - 1 to 4 years (jobs) | | 3,629 | 12,724 | 9,084 | 9,354 | 10,988 | 12,390 |
| On-Site or In-Plant Training - All sectors - 4 to 10 years (jobs) | | 1,490 | 5,638 | 3,978 | 4,098 | 4,775 | 5,370 |
| On-Site or In-Plant Training - All sectors - Over 10 years (jobs) | | 183 | 668 | 484 | 501 | 595 | 671 |
| Wage income - All (million \$2019) | | 1,176 | 3,749 | 2,752 | 2,888 | 3,438 | 3,934 |

Table 51: *E-B+ scenario - PILLAR 1: Efficiency/Electrification - Overview*

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|------|------|------|------|------|------|------|
| Final energy use - Transportation (PJ) | 464 | 441 | 404 | 373 | 350 | 323 | 290 |
| Final energy use - Residential (PJ) | 158 | 151 | 147 | 142 | 135 | 128 | 122 |
| Final energy use - Commercial (PJ) | 114 | 115 | 113 | 112 | 109 | 107 | 107 |
| Final energy use - Industry (PJ) | 358 | 374 | 381 | 391 | 402 | 403 | 407 |

Table 52: *E-B+ scenario - PILLAR 1: Efficiency/Electrification - Electricity demand*

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|------|------|------|------|------|------|------|
| Electricity distribution capital invested - Cumulative 5-yr (billion \$2018) | | 2.92 | 2.93 | 3.93 | 4.05 | 5.12 | 5.35 |

Table 53: *E-B+ scenario - PILLAR 1: Efficiency/Electrification - Transportation*

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|-------|-------|-------|-------|-------|-------|-------|
| Vehicle stocks - LDV – EV (1000 units) | 13.5 | 121 | 228 | 724 | 1,221 | 2,319 | 3,418 |
| Vehicle stocks - LDV – All others (1000 units) | 4,468 | 4,468 | 4,468 | 4,238 | 4,008 | 3,089 | 2,169 |
| Light-duty vehicle capital costs vs. REF - Cumulative 5-yr (million \$2018) | | 0 | 138 | 291 | 982 | 3,094 | 4,506 |
| Public EV charging plugs - DC Fast (1000 units) | 0.1 | | 0.496 | | 2.66 | | 7.45 |
| Public EV charging plugs - L2 (1000 units) | 0.476 | | 11.9 | | 63.9 | | 179 |

Table 54: E-B+ scenario - PILLAR 1: Efficiency/Electrification - Residential

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|------|------|------|------|------|------|-------|
| Sales of space heating units - Electric Heat Pump (%) | 37.5 | 46.3 | 49.6 | 59.1 | 73.7 | 83 | 86.3 |
| Sales of space heating units - Electric Resistance (%) | 25.8 | 28.1 | 26.5 | 21.5 | 14 | 9.4 | 7.8 |
| Sales of space heating units - Gas (%) | 30.5 | 17.1 | 15.8 | 12.4 | 7.01 | 3.39 | 2.12 |
| Sales of space heating units - Fossil (%) | 6.1 | 8.46 | 8.09 | 7 | 5.31 | 4.17 | 3.78 |
| Sales of water heating units - Electric Heat Pump (%) | 0 | 2.08 | 8 | 25 | 51.1 | 68.2 | 74.1 |
| Sales of water heating units - Electric Resistance (%) | 67.7 | 78.2 | 73.7 | 60.5 | 40.4 | 27.4 | 22.9 |
| Sales of water heating units - Gas Furnace (%) | 28.2 | 17 | 15.7 | 11.9 | 5.84 | 1.86 | 0.487 |
| Sales of water heating units - Other (%) | 4.1 | 2.66 | 2.65 | 2.64 | 2.62 | 2.58 | 2.57 |
| Sales of cooking units - Electric Resistance (%) | 82.6 | 83.1 | 84.7 | 88.9 | 94.7 | 98.3 | 99.5 |
| Sales of cooking units - Gas (%) | 17.4 | 16.9 | 15.3 | 11.1 | 5.31 | 1.72 | 0.462 |
| Residential HVAC investment in 2020s vs. REF - Cumulative 5-yr (billion \$2018) | | 3.78 | 4.05 | | | | |

Table 55: E-B+ scenario - PILLAR 1: Efficiency/Electrification - Commercial

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|-------|--------|--------|------|------|-------|------|
| Sales of space heating units - Electric Heat Pump (%) | 10.1 | 19.3 | 24.3 | 38.5 | 60.9 | 76.8 | 82.9 |
| Sales of space heating units - Electric Resistance (%) | 9.29 | 8.02 | 8.23 | 8.98 | 10.4 | 11.8 | 12.5 |
| Sales of space heating units - Gas (%) | 78.5 | 68.1 | 63.3 | 49.4 | 27.1 | 10.9 | 4.44 |
| Sales of space heating units - Fossil (%) | 2.15 | 4.53 | 4.19 | 3.17 | 1.56 | 0.496 | 0.13 |
| Sales of water heating units - Electric Heat Pump (%) | 0.316 | 2.04 | 7.05 | 21.5 | 43.6 | 58 | 63 |
| Sales of water heating units - Electric Resistance (%) | 7.81 | 7.62 | 9.51 | 15.3 | 24.1 | 29.8 | 31.8 |
| Sales of water heating units - Gas (%) | 88 | 86.1 | 79.2 | 59.5 | 29.1 | 9.29 | 2.42 |
| Sales of water heating units - Other (%) | 3.86 | 4.23 | 4.21 | 3.8 | 3.27 | 2.9 | 2.77 |
| Sales of cooking units - Electric Resistance (%) | 32 | 36.2 | 40.9 | 53.4 | 71 | 81.7 | 85.5 |
| Sales of cooking units - Gas (%) | 68 | 63.8 | 59.1 | 46.6 | 29 | 18.3 | 14.5 |
| Commercial HVAC investment in 2020s - Cumulative 5-yr (million \$2018) | | 15,746 | 17,554 | | | | |

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

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|-------|-------|-------|-------|-------|-------|-------|
| Installed thermal - Coal (MW) | 5,499 | 2,251 | 0 | 0 | 0 | 0 | 0 |
| Installed thermal - Natural gas (MW) | 6,450 | 8,486 | 7,413 | 7,268 | 5,747 | 3,513 | 3,996 |
| Installed thermal - Nuclear (MW) | 5,220 | 5,220 | 5,220 | 5,220 | 4,333 | 3,440 | 3,440 |
| Capital invested - Biomass power plant (billion \$2018) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Capital invested - Biomass w/ccu allam power plant (billion \$2018) | 0 | 0 | 0 | 0 | 0.008 | 0 | 0.047 |
| Capital invested - Biomass w/ccu power plant (billion \$2018) | 0 | 0 | 0 | 0 | 7.26 | 0 | 0 |

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

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---------------------------------------|------|------|------|------|-------|-------|-------|
| Biomass power plant (GWh) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Biomass w/ccu power plant (GWh) | 0 | 0 | 0 | 0 | 8,149 | 8,149 | 8,149 |
| Biomass w/ccu allam power plant (GWh) | 0 | 0 | 0 | 0 | 7.93 | 7.93 | 55.2 |

Table 58: E-B+ scenario - PILLAR 3: Clean fuels - Bioenergy

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|------|------|------|------|-------|-------|-------|
| Number of facilities - Power (quantity) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Number of facilities - Power ccu (quantity) | 0 | 0 | 0 | 0 | 7 | 7 | 7 |
| Number of facilities - Allam power w ccu (quantity) | 0 | 0 | 0 | 0 | 1 | 1 | 2 |
| Number of facilities - Beccs hydrogen (quantity) | 0 | 0 | 0 | 0 | 0 | 5 | 12 |
| Number of facilities - Diesel (quantity) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Number of facilities - Diesel ccu (quantity) | 0 | 0 | 0 | 0 | 1 | 1 | 2 |
| Number of facilities - Pyrolysis (quantity) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Number of facilities - Pyrolysis ccu (quantity) | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Number of facilities - Sng (quantity) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Number of facilities - Sng ccu (quantity) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Conversion capital investment - Cumulative 5-yr (million \$2018) | | 0 | 0 | 0 | 6,674 | 4,475 | 6,984 |
| Biomass purchases (million \$2018/y) | | 0 | 0 | 0 | 463 | 822 | 1,376 |

Table 59: E-B+ scenario - PILLAR 4: CCUS - CO2 capture

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|------------------------------------|------|------|------|------|------|------|------|
| Annual - All (MMT) | | 0 | 0 | 0 | 11.4 | 17.2 | 27 |
| Annual - BECCS (MMT) | | 0 | 0 | 0 | 8.07 | 13.8 | 23.5 |
| Annual - NGCC (MMT) | | 0 | 0 | 0 | 0 | 0 | 0 |
| Annual - Cement and lime (MMT) | | 0 | 0 | 0 | 3.32 | 3.42 | 3.53 |
| Cumulative - All (MMT) | | 0 | 0 | 0 | 11.4 | 28.6 | 55.6 |
| Cumulative - BECCS (MMT) | | 0 | 0 | 0 | 8.07 | 21.9 | 45.4 |
| Cumulative - NGCC (MMT) | | 0 | 0 | 0 | 0 | 0 | 0 |
| Cumulative - Cement and lime (MMT) | | 0 | 0 | 0 | 3.32 | 6.74 | 10.3 |

Table 60: E-B+ scenario - PILLAR 4: CCUS - CO2 pipelines

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|------|------|------|------|-------|-------|-------|
| Trunk (km) | | 0 | 0 | 159 | 159 | 159 | 159 |
| Spur (km) | | 0 | 0 | 0 | 773 | 1,018 | 1,489 |
| All (km) | | 0 | 0 | 159 | 932 | 1,177 | 1,649 |
| Cumulative investment - Trunk (million \$2018) | | 0 | 0 | 951 | 951 | 951 | 951 |
| Cumulative investment - Spur (million \$2018) | | 0 | 0 | 0 | 993 | 1,199 | 1,755 |
| Cumulative investment - All (million \$2018) | | 0 | 0 | 951 | 1,943 | 2,149 | 2,706 |

Table 61: E-B+ scenario - PILLAR 4: CCUS - CO2 storage

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|------|------|------|------|------|------|------|
| Annual (MMT) | | 0 | 0 | 0 | 0 | 0 | 0 |
| Injection wells (wells) | | 0 | 0 | 0 | 0 | 2 | 2 |
| Resource characterization, appraisal, permitting costs (million \$2020) | | 3.29 | 7.9 | 10.5 | 10.5 | 10.5 | 10.5 |
| Wells and facilities construction costs (million \$2020) | | 0 | 4.11 | 16 | 28.5 | 47.7 | 59.2 |

Table 62: E-B+ scenario - PILLAR 6: Land sinks - Forests

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|------|------|------|------|------|------|---------|
| Carbon sink potential - Low - Accelerate regeneration (1000 tCO2e/y) | | | | | | | -158 |
| Carbon sink potential - Low - Avoid deforestation (1000 tCO2e/y) | | | | | | | -274 |
| Carbon sink potential - Low - Extend rotation length (1000 tCO2e/y) | | | | | | | -2,808 |
| Carbon sink potential - Low - Improve plantations (1000 tCO2e/y) | | | | | | | -1,420 |
| Carbon sink potential - Low - Increase retention of HWP (1000 tCO2e/y) | | | | | | | -5,902 |
| Carbon sink potential - Low - Increase trees outside forests (1000 tCO2e/y) | | | | | | | -187 |
| Carbon sink potential - Low - Reforest cropland (1000 tCO2e/y) | | | | | | | -407 |
| Carbon sink potential - Low - Reforest pasture (1000 tCO2e/y) | | | | | | | -183 |
| Carbon sink potential - Low - Restore productivity (1000 tCO2e/y) | | | | | | | -922 |
| Carbon sink potential - Low - All (not counting overlap) (1000 tCO2e/y) | | | | | | | -12,261 |
| Carbon sink potential - Mid - Accelerate regeneration (1000 tCO2e/y) | | | | | | | -236 |
| Carbon sink potential - Mid - Avoid deforestation (1000 tCO2e/y) | | | | | | | -960 |
| Carbon sink potential - Mid - Extend rotation length (1000 tCO2e/y) | | | | | | | -5,059 |
| Carbon sink potential - Mid - Improve plantations (1000 tCO2e/y) | | | | | | | -2,081 |
| Carbon sink potential - Mid - Increase retention of HWP (1000 tCO2e/y) | | | | | | | -11,805 |
| Carbon sink potential - Mid - Increase trees outside forests (1000 tCO2e/y) | | | | | | | -360 |
| Carbon sink potential - Mid - Reforest cropland (1000 tCO2e/y) | | | | | | | -610 |
| Carbon sink potential - Mid - Reforest pasture (1000 tCO2e/y) | | | | | | | -1,303 |
| Carbon sink potential - Mid - Restore productivity (1000 tCO2e/y) | | | | | | | -1,829 |
| Carbon sink potential - Mid - All (not counting overlap) (1000 tCO2e/y) | | | | | | | -24,243 |
| Carbon sink potential - High - Accelerate regeneration (1000 tCO2e/y) | | | | | | | -315 |
| Carbon sink potential - High - Avoid deforestation (1000 tCO2e/y) | | | | | | | -1,646 |
| Carbon sink potential - High - Extend rotation length (1000 tCO2e/y) | | | | | | | -7,310 |
| Carbon sink potential - High - Improve plantations (1000 tCO2e/y) | | | | | | | -2,791 |
| Carbon sink potential - High - Increase retention of HWP (1000 tCO2e/y) | | | | | | | -17,707 |
| Carbon sink potential - High - Increase trees outside forests (1000 tCO2e/y) | | | | | | | -534 |
| Carbon sink potential - High - Reforest cropland (1000 tCO2e/y) | | | | | | | -813 |
| Carbon sink potential - High - Reforest pasture (1000 tCO2e/y) | | | | | | | -2,422 |
| Carbon sink potential - High - All (not counting overlap) (1000 tCO2e/y) | | | | | | | -36,273 |
| Carbon sink potential - High - Restore productivity (1000 tCO2e/y) | | | | | | | -2,736 |

Table 62: E-B+ scenario - PILLAR 6: Land sinks - Forests (continued)

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|------|------|------|------|------|------|-------|
| Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares) | | | | | | | 25.7 |
| Land impacted for carbon sink potential - Low - Avoid deforestation (over 30 years) (1000 hectares) | | | | | | | 209 |
| Land impacted for carbon sink potential - Low - Extend rotation length (1000 hectares) | | | | | | | 1,428 |
| Land impacted for carbon sink potential - Low - Improve plantations (1000 hectares) | | | | | | | 514 |
| Land impacted for carbon sink potential - Low - Increase retention of HWP (1000 hectares) | | | | | | | 0 |
| Land impacted for carbon sink potential - Low - Increase trees outside forests (1000 hectares) | | | | | | | 26.7 |
| Land impacted for carbon sink potential - Low - Reforest cropland (1000 hectares) | | | | | | | 26.9 |
| Land impacted for carbon sink potential - Low - Reforest pasture (1000 hectares) | | | | | | | 11.9 |
| Land impacted for carbon sink potential - Low - Restore productivity (1000 hectares) | | | | | | | 549 |
| Land impacted for carbon sink potential - Low - Total impacted (over 30 years) (1000 hectares) | | | | | | | 2,791 |
| Land impacted for carbon sink potential - Mid - Accelerate regeneration (1000 hectares) | | | | | | | 38.6 |
| Land impacted for carbon sink potential - Mid - Avoid deforestation (over 30 years) (1000 hectares) | | | | | | | 216 |
| Land impacted for carbon sink potential - Mid - Extend rotation length (1000 hectares) | | | | | | | 2,578 |
| Land impacted for carbon sink potential - Mid - Improve plantations (1000 hectares) | | | | | | | 774 |
| Land impacted for carbon sink potential - Mid - Increase retention of HWP (1000 hectares) | | | | | | | 0 |
| Land impacted for carbon sink potential - Mid - Increase trees outside forests (1000 hectares) | | | | | | | 38.7 |
| Land impacted for carbon sink potential - Mid - Reforest cropland (1000 hectares) | | | | | | | 40.3 |
| Land impacted for carbon sink potential - Mid - Reforest pasture (1000 hectares) | | | | | | | 86.2 |
| Land impacted for carbon sink potential - Mid - Restore productivity (1000 hectares) | | | | | | | 1,105 |
| Land impacted for carbon sink potential - Mid - Total impacted (over 30 years) (1000 hectares) | | | | | | | 4,876 |
| Land impacted for carbon sink potential - High - Accelerate regeneration (1000 hectares) | | | | | | | 51.5 |
| Land impacted for carbon sink potential - High - Avoid deforestation (over 30 years) (1000 hectares) | | | | | | | 223 |

Table 62: E-B+ scenario - PILLAR 6: Land sinks - Forests (continued)

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|------|------|------|------|------|------|-------|
| Land impacted for carbon sink potential - High - Extend rotation length (1000 hectares) | | | | | | | 3,727 |
| Land impacted for carbon sink potential - High - Improve plantations (1000 hectares) | | | | | | | 1,028 |
| Land impacted for carbon sink potential - High - Increase retention of HWP (1000 hectares) | | | | | | | 0 |
| Land impacted for carbon sink potential - High - Increase trees outside forests (1000 hectares) | | | | | | | 50.7 |
| Land impacted for carbon sink potential - High - Reforest cropland (1000 hectares) | | | | | | | 53.8 |
| Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares) | | | | | | | 68.8 |
| Land impacted for carbon sink potential - High - Restore productivity (1000 hectares) | | | | | | | 907 |
| Land impacted for carbon sink potential - High - Total impacted (over 30 years) (1000 hectares) | | | | | | | 6,110 |

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

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|------|------|------|------|------|------|--------|
| Carbon sink potential - Moderate deployment - Corn-ethanol to energy grasses (1000 tCO ₂ e/y) | | | | | | | -218 |
| Carbon sink potential - Moderate deployment - Cropland measures (1000 tCO ₂ e/y) | | | | | | | -600 |
| Carbon sink potential - Moderate deployment - Permanent conservation cover (1000 tCO ₂ e/y) | | | | | | | -16.9 |
| Carbon sink potential - Moderate deployment - Cropland to woody energy crops (1000 tCO ₂ e/y) | | | | | | | 0 |
| Carbon sink potential - Moderate deployment - Pasture to energy crops (1000 tCO ₂ e/y) | | | | | | | 0 |
| Carbon sink potential - Moderate deployment - Total (1000 tCO ₂ e/y) | | | | | | | -834 |
| Carbon sink potential - Aggressive deployment - Corn-ethanol to energy grasses (1000 tCO ₂ e/y) | | | | | | | -218 |
| Carbon sink potential - Aggressive deployment - Cropland measures (1000 tCO ₂ e/y) | | | | | | | -1,143 |
| Carbon sink potential - Aggressive deployment - Permanent conservation cover (1000 tCO ₂ e/y) | | | | | | | -33.8 |
| Carbon sink potential - Aggressive deployment - Cropland to woody energy crops (1000 tCO ₂ e/y) | | | | | | | 0 |
| Carbon sink potential - Aggressive deployment - Pasture to energy crops (1000 tCO ₂ e/y) | | | | | | | 0 |
| Carbon sink potential - Aggressive deployment - Total (1000 tCO ₂ e/y) | | | | | | | -1,395 |

Table 63: *E-B+ scenario - PILLAR 6: Land sinks - Agriculture (continued)*

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|------|------|------|------|------|------|-------|
| Land impacted for carbon sink - Moderate deployment - Corn-ethanol to energy grasses (1000 hectares) | | | | | | | 132 |
| Land impacted for carbon sink - Moderate deployment - Cropland measures (1000 hectares) | | | | | | | 328 |
| Land impacted for carbon sink - Moderate deployment - Permanent conservation cover (1000 hectares) | | | | | | | 30.7 |
| Land impacted for carbon sink - Moderate deployment - Cropland to woody energy crops (1000 hectares) | | | | | | | 45.9 |
| Land impacted for carbon sink - Moderate deployment - Pasture to energy crops (1000 hectares) | | | | | | | 85.4 |
| Land impacted for carbon sink - Moderate deployment - Total (1000 hectares) | | | | | | | 623 |
| Land impacted for carbon sink - Aggressive deployment - Corn-ethanol to energy grasses (1000 hectares) | | | | | | | 132 |
| Land impacted for carbon sink - Aggressive deployment - Cropland measures (1000 hectares) | | | | | | | 1,546 |
| Land impacted for carbon sink - Aggressive deployment - Permanent conservation cover (1000 hectares) | | | | | | | 61.4 |
| Land impacted for carbon sink - Aggressive deployment - Cropland to woody energy crops (1000 hectares) | | | | | | | 45.9 |
| Land impacted for carbon sink - Aggressive deployment - Pasture to energy crops (1000 hectares) | | | | | | | 85.4 |
| Land impacted for carbon sink - Aggressive deployment - Total (1000 hectares) | | | | | | | 1,871 |

Table 64: *REF scenario - IMPACTS - Health*

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|------|------|------|------|-------|-------|-------|
| Premature deaths from air pollution - Fuel Comb - Electric Generation - Coal (deaths) | | 114 | 75.8 | 63.5 | 57.8 | 55.6 | 54.2 |
| Premature deaths from air pollution - Fuel Comb - Electric Generation - Natural Gas (deaths) | | 19.6 | 20.9 | 22.8 | 22.8 | 26.3 | 27.6 |
| Premature deaths from air pollution - Mobile - On-Road (deaths) | | 119 | 123 | 127 | 131 | 136 | 141 |
| Premature deaths from air pollution - Gas Stations (deaths) | | 15.6 | 16.1 | 16.5 | 17.1 | 17.6 | 18 |
| Premature deaths from air pollution - Fuel Comb - Residential - Natural Gas (deaths) | | 10.2 | 9.29 | 8.58 | 8.19 | 8.11 | 8.07 |
| Premature deaths from air pollution - Fuel Comb - Residential - Oil (deaths) | | 1.79 | 1.51 | 1.11 | 0.763 | 0.512 | 0.372 |
| Premature deaths from air pollution - Fuel Comb - Residential - Other (deaths) | | 2.04 | 2.02 | 2.03 | 2.08 | 2.14 | 2.2 |
| Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Coal (deaths) | | 1.65 | 1.67 | 1.68 | 1.69 | 1.69 | 1.68 |

Table 64: REF scenario - IMPACTS - Health (continued)

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|------|-------|-------|-------|-------|-------|-------|
| Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Natural Gas (deaths) | | 8.47 | 8.34 | 7.78 | 7.16 | 6.96 | 7.22 |
| Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Oil (deaths) | | 1.56 | 1.53 | 1.47 | 1.39 | 1.33 | 1.31 |
| Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Other (deaths) | | 1.54 | 1.61 | 1.69 | 1.76 | 1.82 | 1.9 |
| Premature deaths from air pollution - Industrial Processes - Coal Mining (deaths) | | 1.18 | 0.862 | 0.73 | 0.704 | 0.694 | 0.663 |
| Premature deaths from air pollution - Industrial Processes - Oil & Gas Production (deaths) | | 24.8 | 26.6 | 27.6 | 26.7 | 26.9 | 25.6 |
| Monetary damages from air pollution - Fuel Comb - Electric Generation - Coal (million \$2019) | | 1,014 | 672 | 563 | 513 | 493 | 480 |
| Monetary damages from air pollution - Fuel Comb - Electric Generation - Natural Gas (million \$2019) | | 173 | 185 | 202 | 202 | 233 | 244 |
| Monetary damages from air pollution - Mobile - On-Road (million \$2019) | | 1,057 | 1,092 | 1,127 | 1,167 | 1,208 | 1,251 |
| Monetary damages from air pollution - Gas Stations (million \$2019) | | 138 | 143 | 146 | 151 | 155 | 160 |
| Monetary damages from air pollution - Fuel Comb - Residential - Natural Gas (million \$2019) | | 90 | 82.3 | 76 | 72.6 | 71.9 | 71.5 |
| Monetary damages from air pollution - Fuel Comb - Residential - Oil (million \$2019) | | 15.9 | 13.4 | 9.85 | 6.76 | 4.53 | 3.29 |
| Monetary damages from air pollution - Fuel Comb - Residential - Other (million \$2019) | | 18.1 | 17.9 | 18 | 18.5 | 19 | 19.5 |
| Monetary damages from air pollution - Fuel Comb - Comm/Institutional - Coal (million \$2019) | | 14.6 | 14.8 | 14.9 | 14.9 | 14.9 | 14.9 |
| Monetary damages from air pollution - Fuel Comb - Comm/Institutional - Natural Gas (million \$2019) | | 75 | 73.8 | 68.9 | 63.4 | 61.6 | 64 |
| Monetary damages from air pollution - Fuel Comb - Comm/Institutional - Oil (million \$2019) | | 13.8 | 13.5 | 13.1 | 12.3 | 11.8 | 11.6 |
| Monetary damages from air pollution - Fuel Comb - Comm/Institutional - Other (million \$2019) | | 13.6 | 14.3 | 14.9 | 15.5 | 16.2 | 16.8 |
| Monetary damages from air pollution - Industrial Processes - Coal Mining (million \$2019) | | 10.4 | 7.61 | 6.44 | 6.22 | 6.12 | 5.85 |
| Monetary damages from air pollution - Industrial Processes - Oil & Gas Production (million \$2019) | | 220 | 236 | 245 | 237 | 239 | 227 |

Table 65: REF scenario - IMPACTS - Jobs

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|------|-------|-------|-------|-------|-------|-------|
| By economic sector - Agriculture (jobs) | | 193 | 173 | 171 | 139 | 139 | 150 |
| By economic sector - Construction (jobs) | | 4,151 | 5,153 | 5,941 | 5,628 | 6,064 | 7,402 |
| By economic sector - Manufacturing (jobs) | | 1,827 | 1,884 | 1,974 | 1,857 | 1,851 | 2,662 |
| By economic sector - Mining (jobs) | | 1,913 | 1,542 | 1,255 | 940 | 800 | 680 |

Table 65: REF scenario - IMPACTS - Jobs (continued)

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|------|--------|--------|--------|--------|--------|--------|
| By economic sector - Other (jobs) | | 210 | 449 | 584 | 673 | 808 | 1,237 |
| By economic sector - Pipeline (jobs) | | 376 | 384 | 386 | 368 | 373 | 374 |
| By economic sector - Professional (jobs) | | 2,731 | 2,855 | 3,055 | 2,810 | 2,881 | 3,460 |
| By economic sector - Trade (jobs) | | 2,013 | 2,045 | 2,101 | 1,900 | 2,003 | 2,464 |
| By economic sector - Utilities (jobs) | | 8,143 | 7,870 | 8,639 | 7,366 | 7,282 | 7,868 |
| By resource sector - Biomass (jobs) | | 743 | 696 | 646 | 577 | 591 | 601 |
| By resource sector - CO2 (jobs) | | 0 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 |
| By resource sector - Coal (jobs) | | 1,477 | 1,050 | 995 | 359 | 0 | 0 |
| By resource sector - Grid (jobs) | | 8,782 | 8,533 | 10,229 | 7,889 | 8,375 | 10,145 |
| By resource sector - Natural Gas (jobs) | | 3,505 | 3,600 | 3,570 | 4,047 | 4,553 | 4,041 |
| By resource sector - Nuclear (jobs) | | 2,635 | 2,593 | 2,552 | 2,160 | 1,629 | 1,604 |
| By resource sector - Oil (jobs) | | 4,388 | 3,744 | 3,292 | 3,054 | 2,914 | 2,819 |
| By resource sector - Solar (jobs) | | | 2,063 | 2,752 | 3,528 | 4,132 | 6,624 |
| By resource sector - Wind (jobs) | | 26.3 | 77.5 | 70.2 | 66.5 | 6.73 | 463 |
| By education level - All sectors - High school diploma or less (jobs) | | 8,765 | 9,222 | 10,021 | 9,011 | 9,305 | 11,111 |
| By education level - All sectors - Associates degree or some college (jobs) | | 6,625 | 6,930 | 7,553 | 6,824 | 7,043 | 8,375 |
| By education level - All sectors - Bachelors degree (jobs) | | 4,811 | 4,838 | 5,093 | 4,553 | 4,561 | 5,310 |
| By education level - All sectors - Masters or professional degree (jobs) | | 1,192 | 1,198 | 1,265 | 1,132 | 1,132 | 1,316 |
| By education level - All sectors - Doctoral degree (jobs) | | 164 | 168 | 175 | 160 | 159 | 186 |
| Related work experience - All sectors - None (jobs) | | 3,090 | 3,217 | 3,488 | 3,149 | 3,247 | 3,851 |
| Related work experience - All sectors - Up to 1 year (jobs) | | 4,080 | 4,308 | 4,667 | 4,204 | 4,325 | 5,208 |
| Related work experience - All sectors - 1 to 4 years (jobs) | | 7,926 | 8,167 | 8,779 | 7,877 | 8,050 | 9,497 |
| Related work experience - All sectors - 4 to 10 years (jobs) | | 5,100 | 5,268 | 5,675 | 5,107 | 5,219 | 6,137 |
| Related work experience - All sectors - Over 10 years (jobs) | | 1,361 | 1,397 | 1,497 | 1,343 | 1,360 | 1,604 |
| On-the-Job Training - All sectors - None (jobs) | | 1,173 | 1,221 | 1,304 | 1,179 | 1,198 | 1,427 |
| On-the-Job Training - All sectors - Up to 1 year (jobs) | | 14,281 | 14,719 | 15,793 | 14,161 | 14,455 | 17,148 |
| On-the-Job Training - All sectors - 1 to 4 years (jobs) | | 4,508 | 4,712 | 5,131 | 4,630 | 4,767 | 5,625 |
| On-the-Job Training - All sectors - 4 to 10 years (jobs) | | 1,405 | 1,501 | 1,660 | 1,510 | 1,576 | 1,850 |
| On-the-Job Training - All sectors - Over 10 years (jobs) | | 188 | 202 | 218 | 201 | 205 | 246 |
| On-Site or In-Plant Training - All sectors - None (jobs) | | 3,444 | 3,583 | 3,848 | 3,480 | 3,549 | 4,221 |
| On-Site or In-Plant Training - All sectors - Up to 1 year (jobs) | | 12,981 | 13,390 | 14,384 | 12,893 | 13,171 | 15,617 |
| On-Site or In-Plant Training - All sectors - 1 to 4 years (jobs) | | 3,490 | 3,647 | 3,968 | 3,577 | 3,683 | 4,355 |
| On-Site or In-Plant Training - All sectors - 4 to 10 years (jobs) | | 1,464 | 1,548 | 1,699 | 1,543 | 1,602 | 1,872 |
| On-Site or In-Plant Training - All sectors - Over 10 years (jobs) | | 177 | 187 | 207 | 187 | 196 | 232 |
| Wage income - All (million \$2019) | | 1,145 | 1,185 | 1,285 | 1,167 | 1,200 | 1,420 |

Table 66: REF scenario - PILLAR 1: Efficiency/Electrification - Overview

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|------|------|------|------|------|------|------|
| Final energy use - Transportation (PJ) | 463 | 441 | 406 | 385 | 385 | 396 | 410 |

Table 66: REF scenario - PILLAR 1: Efficiency/Electrification - Overview (continued)

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|-------------------------------------|------|------|------|------|------|------|------|
| Final energy use - Residential (PJ) | 158 | 152 | 151 | 152 | 156 | 160 | 165 |
| Final energy use - Commercial (PJ) | 114 | 116 | 117 | 119 | 121 | 125 | 132 |
| Final energy use - Industry (PJ) | 358 | 383 | 402 | 413 | 428 | 438 | 452 |

Table 67: REF scenario - PILLAR 1: Efficiency/Electrification - Electricity demand

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|------|------|------|------|------|------|------|
| Electricity distribution capital invested - Cumulative 5-yr (billion \$2018) | | 3.94 | 4.06 | 5.79 | 6.1 | 5.26 | 5.44 |

Table 68: REF scenario - PILLAR 1: Efficiency/Electrification - Residential

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|------|------|------|------|------|------|------|
| Sales of space heating units - Electric Heat Pump (%) | 36.1 | 57.9 | 58.6 | 59.8 | 60.9 | 62.4 | 64.6 |
| Sales of space heating units - Electric Resistance (%) | 26.4 | 22.4 | 22.2 | 21.4 | 20.5 | 19.2 | 16.9 |
| Sales of space heating units - Gas (%) | 31.3 | 13.3 | 13.7 | 13.6 | 13.5 | 13.4 | 13.4 |
| Sales of space heating units - Fossil (%) | 6.23 | 6.42 | 5.5 | 5.15 | 5.08 | 5.05 | 5.09 |
| Sales of water heating units - Electric Heat Pump (%) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sales of water heating units - Electric Resistance (%) | 67.7 | 79.8 | 79.8 | 79.6 | 79.5 | 79.5 | 79.4 |
| Sales of water heating units - Gas Furnace (%) | 28.2 | 17.5 | 17.5 | 17.7 | 17.8 | 17.8 | 17.9 |
| Sales of water heating units - Other (%) | 4.1 | 2.67 | 2.66 | 2.69 | 2.72 | 2.72 | 2.73 |
| Sales of cooking units - Electric Resistance (%) | 82.5 | 82.5 | 82.5 | 82.5 | 82.5 | 82.5 | 82.5 |
| Sales of cooking units - Gas (%) | 17.5 | 17.5 | 17.5 | 17.5 | 17.5 | 17.5 | 17.5 |
| Residential HVAC investment in 2020s vs. REF - Cumulative 5-yr (billion \$2018) | | 3.77 | 3.56 | | | | |

Table 69: REF scenario - PILLAR 1: Efficiency/Electrification - Commercial

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|-------|--------|--------|-------|-------|-------|-------|
| Sales of space heating units - Electric Heat Pump (%) | 10.1 | 29.8 | 65.1 | 72 | 72.3 | 72.3 | 72.4 |
| Sales of space heating units - Electric Resistance (%) | 9.29 | 9.59 | 14.9 | 20.3 | 25 | 25.7 | 25.7 |
| Sales of space heating units - Gas (%) | 78.5 | 56.5 | 17.5 | 6.45 | 2.54 | 1.99 | 1.94 |
| Sales of space heating units - Fossil (%) | 2.15 | 4.14 | 2.51 | 1.22 | 0.185 | 0.016 | 0 |
| Sales of water heating units - Electric Heat Pump (%) | 0.316 | 0.281 | 0.275 | 0.277 | 0.278 | 0.276 | 0.277 |
| Sales of water heating units - Electric Resistance (%) | 7.81 | 6.92 | 6.81 | 6.83 | 6.85 | 6.81 | 6.81 |
| Sales of water heating units - Gas (%) | 88 | 88.5 | 88.5 | 88.6 | 88.5 | 88.5 | 88.5 |
| Sales of water heating units - Other (%) | 3.86 | 4.28 | 4.39 | 4.33 | 4.38 | 4.4 | 4.38 |
| Sales of cooking units - Electric Resistance (%) | 32 | 34.3 | 34.3 | 34.3 | 34.4 | 34.3 | 34.3 |
| Sales of cooking units - Gas (%) | 68 | 65.7 | 65.7 | 65.7 | 65.6 | 65.7 | 65.7 |
| Commercial HVAC investment in 2020s - Cumulative 5-yr (million \$2018) | | 15,522 | 16,121 | | | | |

Table 70: REF scenario - PILLAR 2: Clean Electricity - Generating capacity

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|-------|-------|-------|-------|-------|--------|--------|
| Installed thermal - Coal (MW) | 5,499 | 2,807 | 2,807 | 2,807 | 0 | 0 | 0 |
| Installed thermal - Natural gas (MW) | 6,450 | 8,486 | 8,010 | 8,486 | 7,328 | 10,349 | 13,941 |
| Installed thermal - Nuclear (MW) | 5,220 | 5,220 | 5,220 | 5,220 | 3,440 | 3,440 | 3,440 |
| Installed renewables - Rooftop PV (MW) | 353 | 569 | 805 | 1,146 | 1,626 | 2,248 | 3,044 |

Table 70: REF scenario - PILLAR 2: Clean Electricity - Generating capacity (continued)

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|-------|-------|-------|-------|-------|-------|-------|
| Installed renewables - Solar - Base land use assumptions (MW) | 1,464 | 1,464 | 1,464 | 1,464 | 1,464 | 1,464 | 1,464 |
| Installed renewables - Solar - Constrained land use assumptions (MW) | 7.69 | 7.69 | 7.69 | 7.69 | 7.69 | 7.69 | 7.69 |

Table 71: REF scenario - PILLAR 2: Clean Electricity - Generation

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|-------|-------|-------|-------|-------|-------|-------|
| Solar - Base land use assumptions (GWh) | 3,487 | 3,487 | 3,487 | 3,487 | 3,487 | 3,487 | 3,487 |
| Wind - Base land use assumptions (GWh) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| OffshoreWind - Base land use assumptions (GWh) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Table 72: REF scenario - PILLAR 6: Land sinks - Forests - REF only

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|-------|------|-------|------|------|------|-------|
| Business-as-usual carbon sink - Natural uptake (Mt CO2e/y) | -9.71 | | -9.95 | | | | -8.06 |
| Business-as-usual carbon sink - Retained in Hardwood Products (Mt CO2e/y) | -4.82 | | -8.04 | | | | -8.46 |
| Business-as-usual carbon sink - Total (Mt CO2e/y) | -14.5 | | -18 | | | | -16.5 |

Table 73: REF scenario - PILLAR 6: Land sinks - Forests

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|------|------|------|------|------|------|---------|
| Carbon sink potential - Low - Accelerate regeneration (1000 tCO2e/y) | | | | | | | -158 |
| Carbon sink potential - Low - Avoid deforestation (1000 tCO2e/y) | | | | | | | -274 |
| Carbon sink potential - Low - Extend rotation length (1000 tCO2e/y) | | | | | | | -2,808 |
| Carbon sink potential - Low - Improve plantations (1000 tCO2e/y) | | | | | | | -1,420 |
| Carbon sink potential - Low - Increase retention of HWP (1000 tCO2e/y) | | | | | | | -5,902 |
| Carbon sink potential - Low - Increase trees outside forests (1000 tCO2e/y) | | | | | | | -187 |
| Carbon sink potential - Low - Reforest cropland (1000 tCO2e/y) | | | | | | | -407 |
| Carbon sink potential - Low - Reforest pasture (1000 tCO2e/y) | | | | | | | -183 |
| Carbon sink potential - Low - Restore productivity (1000 tCO2e/y) | | | | | | | -922 |
| Carbon sink potential - Low - All (not counting overlap) (1000 tCO2e/y) | | | | | | | -12,261 |
| Carbon sink potential - Mid - Accelerate regeneration (1000 tCO2e/y) | | | | | | | -236 |
| Carbon sink potential - Mid - Avoid deforestation (1000 tCO2e/y) | | | | | | | -960 |
| Carbon sink potential - Mid - Extend rotation length (1000 tCO2e/y) | | | | | | | -5,059 |
| Carbon sink potential - Mid - Improve plantations (1000 tCO2e/y) | | | | | | | -2,081 |
| Carbon sink potential - Mid - Increase retention of HWP (1000 tCO2e/y) | | | | | | | -11,805 |
| Carbon sink potential - Mid - Increase trees outside forests (1000 tCO2e/y) | | | | | | | -360 |
| Carbon sink potential - Mid - Reforest cropland (1000 tCO2e/y) | | | | | | | -610 |

Table 73: REF scenario - PILLAR 6: Land sinks - Forests (continued)

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|------|------|------|------|------|------|---------|
| Carbon sink potential - Mid - Reforest pasture (1000 tCO ₂ e/y) | | | | | | | -1,303 |
| Carbon sink potential - Mid - Restore productivity (1000 tCO ₂ e/y) | | | | | | | -1,829 |
| Carbon sink potential - Mid - All (not counting overlap) (1000 tCO ₂ e/y) | | | | | | | -24,243 |
| Carbon sink potential - High - Accelerate regeneration (1000 tCO ₂ e/y) | | | | | | | -315 |
| Carbon sink potential - High - Avoid deforestation (1000 tCO ₂ e/y) | | | | | | | -1,646 |
| Carbon sink potential - High - Extend rotation length (1000 tCO ₂ e/y) | | | | | | | -7,310 |
| Carbon sink potential - High - Improve plantations (1000 tCO ₂ e/y) | | | | | | | -2,791 |
| Carbon sink potential - High - Increase retention of HWP (1000 tCO ₂ e/y) | | | | | | | -17,707 |
| Carbon sink potential - High - Increase trees outside forests (1000 tCO ₂ e/y) | | | | | | | -534 |
| Carbon sink potential - High - Reforest cropland (1000 tCO ₂ e/y) | | | | | | | -813 |
| Carbon sink potential - High - Reforest pasture (1000 tCO ₂ e/y) | | | | | | | -2,422 |
| Carbon sink potential - High - All (not counting overlap) (1000 tCO ₂ e/y) | | | | | | | -36,273 |
| Carbon sink potential - High - Restore productivity (1000 tCO ₂ e/y) | | | | | | | -2,736 |
| Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares) | | | | | | | 25.7 |
| Land impacted for carbon sink potential - Low - Avoid deforestation (over 30 years) (1000 hectares) | | | | | | | 209 |
| Land impacted for carbon sink potential - Low - Extend rotation length (1000 hectares) | | | | | | | 1,428 |
| Land impacted for carbon sink potential - Low - Improve plantations (1000 hectares) | | | | | | | 514 |
| Land impacted for carbon sink potential - Low - Increase retention of HWP (1000 hectares) | | | | | | | 0 |
| Land impacted for carbon sink potential - Low - Increase trees outside forests (1000 hectares) | | | | | | | 26.7 |
| Land impacted for carbon sink potential - Low - Reforest cropland (1000 hectares) | | | | | | | 26.9 |
| Land impacted for carbon sink potential - Low - Reforest pasture (1000 hectares) | | | | | | | 11.9 |
| Land impacted for carbon sink potential - Low - Restore productivity (1000 hectares) | | | | | | | 549 |
| Land impacted for carbon sink potential - Low - Total impacted (over 30 years) (1000 hectares) | | | | | | | 2,791 |
| Land impacted for carbon sink potential - Mid - Accelerate regeneration (1000 hectares) | | | | | | | 38.6 |
| Land impacted for carbon sink potential - Mid - Avoid deforestation (over 30 years) (1000 hectares) | | | | | | | 216 |

Table 73: REF scenario - PILLAR 6: Land sinks - Forests (continued)

| Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|------|------|------|------|------|------|-------|
| Land impacted for carbon sink potential - Mid - Extend rotation length (1000 hectares) | | | | | | | 2,578 |
| Land impacted for carbon sink potential - Mid - Improve plantations (1000 hectares) | | | | | | | 774 |
| Land impacted for carbon sink potential - Mid - Increase retention of HWP (1000 hectares) | | | | | | | 0 |
| Land impacted for carbon sink potential - Mid - Increase trees outside forests (1000 hectares) | | | | | | | 38.7 |
| Land impacted for carbon sink potential - Mid - Reforest cropland (1000 hectares) | | | | | | | 40.3 |
| Land impacted for carbon sink potential - Mid - Reforest pasture (1000 hectares) | | | | | | | 86.2 |
| Land impacted for carbon sink potential - Mid - Restore productivity (1000 hectares) | | | | | | | 1,105 |
| Land impacted for carbon sink potential - Mid - Total impacted (over 30 years) (1000 hectares) | | | | | | | 4,876 |
| Land impacted for carbon sink potential - High - Accelerate regeneration (1000 hectares) | | | | | | | 51.5 |
| Land impacted for carbon sink potential - High - Avoid deforestation (over 30 years) (1000 hectares) | | | | | | | 223 |
| Land impacted for carbon sink potential - High - Extend rotation length (1000 hectares) | | | | | | | 3,727 |
| Land impacted for carbon sink potential - High - Improve plantations (1000 hectares) | | | | | | | 1,028 |
| Land impacted for carbon sink potential - High - Increase retention of HWP (1000 hectares) | | | | | | | 0 |
| Land impacted for carbon sink potential - High - Increase trees outside forests (1000 hectares) | | | | | | | 50.7 |
| Land impacted for carbon sink potential - High - Reforest cropland (1000 hectares) | | | | | | | 53.8 |
| Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares) | | | | | | | 68.8 |
| Land impacted for carbon sink potential - High - Restore productivity (1000 hectares) | | | | | | | 907 |
| Land impacted for carbon sink potential - High - Total impacted (over 30 years) (1000 hectares) | | | | | | | 6,110 |