

# Net-Zero America - Utah data

# October 29, 2021 (updated November 17, 2023)

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

| lable 1: E+ scenario - IMPACTS - Health   |      |       |       |         |       |       |       |
|---|------|-------|-------|---------|-------|-------|-------|
| Item                                      | 2020 | 2025  | 2030  | 2035    | 2040  | 2045  | 2050  |
| Premature deaths from air pollution -     |      | 17.8  | 0.021 | 0.021   | 0.018 | 0.012 | 0     |
| Fuel Comb - Electric Generation - Coal    |      |       |       |         |       |       |       |
| (deaths)                                  |      |       |       |         |       |       |       |
| Premature deaths from air pollution -     |      | 4.37  | 3.31  | 2.48    | 2.19  | 1.72  | 1.28  |
| Fuel Comb - Electric Generation - Natural |      |       |       |         |       |       |       |
| Gas (deaths)                              |      |       |       |         |       |       |       |
| Premature deaths from air pollution -     |      | 83.8  | 81.5  | 64.3    | 38.3  | 18    | 7.23  |
| Mobile - On-Road (deaths)                 |      | 00.0  | 00    | 0       | 00.0  |       | 0     |
| Premature deaths from air pollution - Gas |      | 3.94  | 3.78  | 3       | 1.9   | 1.04  | 0.599 |
| Stations (deaths)                         |      | 0.74  | 0.10  | 0       | 1.7   | 1.04  | 0.077 |
| Premature deaths from air pollution -     |      | 16.6  | 15.9  | 12.3    | 7.43  | 3.73  | 1.49  |
| Fuel Comb - Residential - Natural Gas     |      | 10.0  | 13.9  | 12.5    | 1.43  | 3.13  | 1.47  |
|   |      |       |       |         |       |       |       |
| (deaths)                                  |      | 0.075 | 0.070 | 0.057   | 0.000 | 0.000 | 0.010 |
| Premature deaths from air pollution -     |      | 0.075 | 0.068 | 0.054   | 0.039 | 0.028 | 0.019 |
| Fuel Comb - Residential - Oil (deaths)    |      |       |       | 2 - 2 2 |       |       |       |
| Premature deaths from air pollution -     |      | 0.626 | 0.623 | 0.533   | 0.39  | 0.241 | 0.134 |
| Fuel Comb - Residential - Other (deaths)  |      |       |       |         |       |       |       |
| Premature deaths from air pollution -     |      | 0.053 | 0.053 | 0.052   | 0.051 | 0.05  | 0.048 |
| Fuel Comb - Comm/Institutional - Coal     |      |       |       |         |       |       |       |
| (deaths)                                  |      |       |       |         |       |       |       |
| Premature deaths from air pollution -     |      | 5.19  | 4.84  | 3.82    | 2.47  | 1.34  | 0.6   |
| Fuel Comb - Comm/Institutional - Natural  |      |       |       |         |       |       |       |
| Gas (deaths)                              |      |       |       |         |       |       |       |
| Premature deaths from air pollution -     |      | 0.423 | 0.351 | 0.286   | 0.224 | 0.165 | 0.11  |
| Fuel Comb - Comm/Institutional - Oil      |      | 0.120 | 0.001 | 0.200   | 0.22  | 0.100 | 0     |
| (deaths)                                  |      |       |       |         |       |       |       |
| Premature deaths from air pollution -     |      | 0.842 | 0.734 | 0.62    | 0.499 | 0.376 | 0.253 |
|   |      | 0.042 | 0.134 | 0.02    | 0.477 | 0.370 | 0.233 |
| Fuel Comb - Comm/Institutional - Other    |      |       |       |         |       |       |       |
| (deaths)                                  |      | 0.100 | 0.005 | 0.007   | 0.000 | 0.001 |       |
| Premature deaths from air pollution -     |      | 0.188 | 0.025 | 0.024   | 0.022 | 0.021 | 0.02  |
| Industrial Processes - Coal Mining        |      |       |       |         |       |       |       |
| (deaths)                                  |      |       |       |         |       |       |       |
| Premature deaths from air pollution -     |      | 21.4  | 20.7  | 19.3    | 15.4  | 11.7  | 7.37  |
| Industrial Processes - Oil & Gas          |      |       |       |         |       |       |       |
| Production (deaths)                       |      |       |       |         |       |       |       |
| Monetary damages from air pollution -     |      | 158   | 0.183 | 0.183   | 0.163 | 0.107 | 0     |
| Fuel Comb - Electric Generation - Coal    |      |       |       |         |       |       |       |
| (million \$2019)                          |      |       |       |         |       |       |       |
| Monetary damages from air pollution -     |      | 38.7  | 29.3  | 22      | 19.4  | 15.2  | 11.3  |
| Fuel Comb - Electric Generation - Natural |      |       |       |         |       |       |       |
| Gas (million \$2019)                      |      |       |       |         |       |       |       |
| Monetary damages from air pollution -     |      | 745   | 724   | 572     | 341   | 160   | 64.3  |
| Mobile - On-Road (million \$2019)         |      | 0     |       | 5.2     | · · · | .55   | 2 110 |
| Monetary damages from air pollution -     |      | 34.9  | 33.5  | 26.6    | 16.8  | 9.17  | 5.31  |
| Gas Stations (million \$2019)             |      | 34.7  | 33.5  | 20.0    | 10.0  | 7.11  | 3.31  |
| Monetary damages from air pollution -     |      | 147   | 141   | 109     | 65.8  | 33.1  | 13.2  |
|   |      | 141   | 141   | 109     | 65.6  | 33.1  | 13.2  |
| Fuel Comb - Residential - Natural Gas     |      |       |       |         |       |       |       |
| (million \$2019)                          |      | 0.440 |       | 0.470   | 0.017 | 2011  |       |
| Monetary damages from air pollution -     |      | 0.668 | 0.6   | 0.479   | 0.347 | 0.244 | 0.165 |
| Fuel Comb - Residential - Oil (million    |      |       |       |         |       |       |       |
| \$2019)                                   |      |       |       |         |       |       |       |
| Monetary damages from air pollution -     |      | 5.55  | 5.52  | 4.73    | 3.46  | 2.13  | 1.19  |
| Fuel Comb - Residential - Other (million  |      |       |       |         |       |       |       |
| \$2019)                                   |      |       |       |         |       |       |       |
| Monetary damages from air pollution -     |      | 0.473 | 0.47  | 0.463   | 0.453 | 0.439 | 0.422 |
| Fuel Comb - Comm/Institutional - Coal     |      |       |       |         |       |       |       |
| (million \$2019)                          |      |       |       |         |       |       |       |
| Monetary damages from air pollution -     |      | 46    | 42.9  | 33.8    | 21.9  | 11.9  | 5.31  |
| Fuel Comb - Comm/Institutional - Natural  |      | -     |       | _       |       |       | -     |
| Gas (million \$2019)                      |      |       |       |         |       |       |       |
| 222 (                                     |      |       |       |         |       |       |       |

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

| Item                                   | 2020 | 2025 | 2030  | 2035  | 2040  | 2045  | 2050  |
|--|------|------|-------|-------|-------|-------|-------|
| Monetary damages from air pollution -  |      | 3.75 | 3.11  | 2.54  | 1.98  | 1.46  | 0.971 |
| Fuel Comb - Comm/Institutional - Oil   |      |      |       |       |       |       |       |
| (million \$2019)                       |      |      |       |       |       |       |       |
| Monetary damages from air pollution -  |      | 7.46 | 6.49  | 5.48  | 4.42  | 3.33  | 2.24  |
| Fuel Comb - Comm/Institutional - Other |      |      |       |       |       |       |       |
| (million \$2019)                       |      |      |       |       |       |       |       |
| Monetary damages from air pollution -  |      | 1.66 | 0.225 | 0.213 | 0.194 | 0.184 | 0.18  |
| Industrial Processes - Coal Mining     |      |      |       |       |       |       |       |
| (million \$2019)                       |      |      |       |       |       |       |       |
| Monetary damages from air pollution -  |      | 190  | 184   | 171   | 137   | 104   | 65.5  |
| Industrial Processes - Oil & Gas       |      |      |       |       |       |       |       |
| Production (million \$2019)            |      |      |       |       |       |       |       |

Table 2: E+ scenario - IMPACTS - Jobs

| 2020 | 2025   | 2030  | 2035  | 2040  | 2045   | 2050  |
|------|--------|---|---|---|--|---|
|      |        |   |   |   |  | 17.2  |
|      |        |   |   |   |  | 7,255   |
|      | 3,781  | 4,984   | 5,212   | 4,443   | 3,713  | 3,718   |
|      |        |   |   |   |  |   |
|      |        |   |   |   |  | 655   |
|      |        |   |   |   |  | 1,431   |
|      | I      |   |   |   |  | 108   |
|      |        |   |   |   |  | 4,109   |
|      | 2,770  | 2,739   | 2,610   | 2,334   | 2,251  | 2,822   |
|      | 3,968  | 6,953   | 6,608   | 5,595   | 5,294  | 5,494   |
|      | 18     | 34.3  | 26.7  | 23.3  | 21.4   | 73.6  |
|      | 0      | 0   | 0   | 0   | 0  | 29.4  |
|      | 2,670  | 1,040   | 529   | 460   | 414  | 367   |
|      | 4,821  | 11,903  | 11,865  | 9,886   | 9,238  | 9,960   |
|      | 4,855  | 4,123   | 3,305   | 2,617   | 2,125  | 1,389   |
|      | 0      | 0   | 0   | 0   | 0  | 0   |
|      | 6,802  | 5,928   | 5,041   | 3,591   | 2,603  | 1,588   |
|      |        |   | 4,066   |   |  | 8,080   |
|      |        |   |   |   |  | 4,124   |
|      |        |   | -   |   |  | 10,743  |
|      | ·      | ,   | , -   | -,  | ,  | -, -  |
|      | 7,191  | 9,105   | 8,819   | 7,692   | 7,153  | 8,228   |
|      | .      |   |   |   | ,  | •   |
|      | 5,237  | 6,163   | 5,842   | 5,010   | 4,588  | 5,156   |
|      | ,      | .   |   |   |  | •   |
|      | 1,244  | 1,476   | 1,397   | 1,209   | 1,125  | 1,290   |
|      |        |   |   |   |  | •   |
|      | 176    | 199   | 189   | 168   | 161  | 193   |
|      |        |   |   |   |  |   |
|      | 3,349  | 4,178   | 4,029   | 3,496   | 3,235  | 3,705   |
|      |        | .   |   |   |  | •   |
|      | 4,656  | 5,695   | 5,534   | 4,819   | 4,453  | 5,155   |
|      | .      | .   |   |   |  | •   |
|      | 8,776  | 10,652  | 10,220  | 8,828   | 8,130  | 9,220   |
|      |        |   |   |   |  |   |
|      | 5,535  | 6,833   | 6,562   | 5,683   | 5,251  | 5,964   |
|      | .      | ,   |   | ,   | ,  | •   |
|      | 1,510  | 1,852   | 1,778   | 1,530   | 1,398  | 1,566   |
|      | .      | -   | •   | •   |  | ,   |
|      | 1,307  | 1,554   | 1,490   | 1,293   | 1,195  | 1,391   |
|      | ,      | ,   | ,   | ,   | ,  | ,   |
|      | 15,983 | 19,360  | 18,628  | 16,090  | 14,779   | 16,773  |
|      |        |   |   |   |  | , -   |
|      | 2020   | 4.2 4,780 3,781  4,907 470 401 2,744 2,770 3,968 18 0 2,670 4,821 4,855 0 6,802 3,397 1,263 9,977 7,191 5,237 7,191 5,237 1,244 176 3,349 4,656 8,776 5,535 1,510 | 4.2       12.4         4,780       6,666         3,781       4,984         4,907       3,453         470       632         401       356         2,744       3,415         2,770       2,739         3,968       6,953         18       34.3         0       0         2,670       1,040         4,821       11,903         4,855       4,123         0       0         6,802       5,928         3,397       3,395         1,263       2,786         9,977       12,266         7,191       9,105         5,237       6,163         1,244       1,476         176       199         3,349       4,178         4,656       5,695         8,776       10,652         5,535       6,833         1,510       1,852         1,307       1,554 | 4.2         12.4         9.37           4,780         6,666         6,701           3,781         4,984         5,212           4,907         3,453         2,594           470         632         706           401         356         302           2,744         3,415         3,383           2,770         2,739         2,610           3,968         6,953         6,608           18         34.3         26.7           0         0         0           2,670         1,040         529           4,821         11,903         11,865           4,855         4,123         3,305           0         0         0           6,802         5,928         5,041           3,397         3,395         4,066           1,263         2,786         3,292           9,977         12,266         11,877           7,191         9,105         8,819           5,237         6,163         5,842           1,244         1,476         1,397           176         199         189           3,349         4,178         4, | 4.2         12.4         9.37         7.75           4,780         6,666         6,701         6,082           3,781         4,984         5,212         4,443           4,907         3,453         2,594         1,720           470         632         706         753           401         356         302         229           2,744         3,415         3,383         3,192           2,770         2,739         2,610         2,334           3,968         6,953         6,608         5,595           18         34.3         26.7         23.3           0         0         0         0           2,670         1,040         529         460           4,821         11,903         11,865         9,886           4,855         4,123         3,305         2,617           0         0         0         0         0           6,802         5,928         5,041         3,591           3,397         3,395         4,066         4,323           1,263         2,786         3,292         3,458           9,977         12,266         11,877 | 4.2         12.4         9.37         7.75         5.85           4,780         6,666         6,701         6,082         5,857           3,781         4,984         5,212         4,443         3,713           4,907         3,453         2,594         1,720         1,121           470         632         706         753         833           401         356         302         229         161           2,744         3,415         3,383         3,192         3,230           2,770         2,739         2,610         2,334         2,251           3,968         6,953         6,608         5,595         5,294           18         34.3         26.7         23.3         21.4           0         0         0         0         0           2,670         1,040         529         460         414           4,821         11,903         11,865         9,886         9,238           4,855         4,123         3,305         2,617         2,125           0         0         0         0         0         0           6,802         5,928         5,041         3, |

| Table 2: E+ scen   | ιανίο - ΤΜΟΛΥΤΟ     | - Inhe Leontini  | ındl |
|--------------------|---------------------|------------------|------|
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| Item   | 2020 | 2025   | 2030   | 2035   | 2040   | 2045   | 2050   |
|--|------|--------|--------|--------|--------|--------|--------|
| On-the-Job Training - All sectors - 1 to 4 years (jobs)              |      | 4,868  | 6,139  | 5,919  | 5,141  | 4,767  | 5,439  |
| On-the-Job Training - All sectors - 4 to 10 years (jobs)             |      | 1,441  | 1,881  | 1,818  | 1,599  | 1,512  | 1,763  |
| On-the-Job Training - All sectors - Over 10 years (jobs)             |      | 226    | 275    | 268    | 233    | 213    | 245    |
| On-Site or In-Plant Training - All sectors -<br>None (jobs)          |      | 3,786  | 4,630  | 4,464  | 3,885  | 3,598  | 4,157  |
| On-Site or In-Plant Training - All sectors -<br>Up to 1 year (jobs)  |      | 14,521 | 17,605 | 16,933 | 14,621 | 13,431 | 15,236 |
| On-Site or In-Plant Training - All sectors -<br>1 to 4 years (jobs)  |      | 3,812  | 4,780  | 4,611  | 4,000  | 3,701  | 4,217  |
| On-Site or In-Plant Training - All sectors -<br>4 to 10 years (jobs) |      | 1,522  | 1,950  | 1,875  | 1,640  | 1,539  | 1,774  |
| On-Site or In-Plant Training - All sectors -<br>Over 10 years (jobs) |      | 184    | 246    | 239    | 210    | 197    | 226    |
| Wage income - All (million \$2019)                                   |      | 1,290  | 1,588  | 1,534  | 1,336  | 1,242  | 1,414  |

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

| Item                                    | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050  |
|---|------|------|------|------|------|------|-------|
| Oil consumption - Annual (million bbls) |      | 53.1 | 45.7 | 34.9 | 24.7 | 16.6 | 10    |
| Oil consumption - Cumulative (million   |      |      |      |      |      |      | 1,076 |
| bbls)                                   |      |      |      |      |      |      |       |
| Oil production - Annual (million bbls)  |      | 48   | 48.2 | 48.1 | 38.1 | 31   | 20.6  |
| Natural gas consumption - Annual (tcf)  |      | 189  | 159  | 128  | 96   | 60.4 | 41.9  |
| Natural gas consumption - Cumulative    |      |      |      |      |      |      | 3,842 |
| (tcf)                                   |      |      |      |      |      |      |       |
| Natural gas production - Annual (tcf)   |      | 348  | 329  | 287  | 242  | 192  | 149   |

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

| Item                                   | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|------|------|------|------|------|------|------|
| Final energy use - Transportation (PJ) | 304  | 290  | 260  | 223  | 188  | 168  | 161  |
| Final energy use - Residential (PJ)    | 126  | 122  | 118  | 106  | 90.4 | 79.2 | 72.3 |
| Final energy use - Commercial (PJ)     | 103  | 103  | 101  | 94.8 | 87.6 | 82.5 | 80.3 |
| Final energy use - Industry (PJ)       | 86.5 | 89.3 | 90.2 | 96.9 | 111  | 116  | 122  |

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

| Item  | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|------|------|------|------|------|------|------|
| Electricity distribution capital invested - |      | 1.72 | 1.81 | 3.2  | 3.44 | 3.67 | 3.91 |
| Cumulative 5-yr (billion \$2018)            |      |      |      |      |      |      |      |

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

| Item                                       | 2020  | 2025  | 2030  | 2035  | 2040  | 2045  | 2050  |
|--|-------|-------|-------|-------|-------|-------|-------|
| Vehicle stocks - LDV – EV (1000 units)     | 48.6  | 240   | 431   | 1,101 | 1,770 | 2,306 | 2,841 |
| Vehicle stocks - LDV – All others (1000    | 2,369 | 2,255 | 2,142 | 1,561 | 980   | 554   | 129   |
| units)                                     |       |       |       |       |       |       |       |
| Light-duty vehicle capital costs vs. REF - |       | 449   | 1,171 | 1,866 | 2,839 | 3,076 | 2,940 |
| Cumulative 5-yr (million \$2018)           |       |       |       |       |       |       |       |
| Public EV charging plugs - DC Fast (1000   | 0.174 |       | 0.748 |       | 3.07  |       | 4.93  |
| units)                                     |       |       |       |       |       |       |       |
| Public EV charging plugs - L2 (1000 units) | 1.07  |       | 18    |       | 73.9  |       | 119   |

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

| Item                                       | 2020  | 2025 | 2030 | 2035  | 2040  | 2045  | 2050  |
|--|-------|------|------|-------|-------|-------|-------|
| Sales of space heating units - Electric    | 3.03  | 9.9  | 34.8 | 79.5  | 87.6  | 88.4  | 88.2  |
| Heat Pump (%)                              |       |      |      |       |       |       |       |
| Sales of space heating units - Electric    | 3.81  | 7.35 | 5.69 | 2.51  | 1.97  | 1.95  | 1.97  |
| Resistance (%)                             |       |      |      |       |       |       |       |
| Sales of space heating units - Gas (%)     | 89.6  | 73.5 | 50.6 | 9.98  | 2.86  | 2.43  | 2.43  |
| Sales of space heating units - Fossil (%)  | 3.57  | 9.24 | 8.91 | 8.06  | 7.57  | 7.25  | 7.38  |
| Sales of water heating units - Electric    | 0     | 1.51 | 15.7 | 41.6  | 46.2  | 46.5  | 46.5  |
| Heat Pump (%)                              |       |      |      |       |       |       |       |
| Sales of water heating units - Electric    | 7.01  | 15.7 | 26.3 | 48.5  | 52.5  | 52.7  | 52.7  |
| Resistance (%)                             |       |      |      |       |       |       |       |
| Sales of water heating units - Gas Furnace | 92.3  | 82   | 57.3 | 9.09  | 0.535 | 0     | 0     |
| (%)  |       |      |      |       |       |       |       |
| Sales of water heating units - Other (%)   | 0.642 | 0.79 | 0.79 | 0.787 | 0.779 | 0.778 | 0.778 |
| Sales of cooking units - Electric          | 37.1  | 50.5 | 91.5 | 99.6  | 100   | 100   | 100   |
| Resistance (%)                             |       |      |      |       |       |       |       |
| Sales of cooking units - Gas (%)           | 62.9  | 49.5 | 8.47 | 0.426 | 0     | 0     | 0     |
| Residential HVAC investment in 2020s vs.   |       | 2.76 | 3.21 |       |       |       |       |
| REF - Cumulative 5-yr (billion \$2018)     |       |      |      |       |       |       |       |

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

| Item                                      | 2020  | 2025  | 2030  | 2035  | 2040  | 2045  | 2050  |
|---|-------|-------|-------|-------|-------|-------|-------|
| Sales of space heating units - Electric   | 0.749 | 8.98  | 33.5  | 81.9  | 90.4  | 91    | 91    |
| Heat Pump (%)                             |       |       |       |       |       |       |       |
| Sales of space heating units - Electric   | 0.855 | 3.41  | 4.83  | 7.94  | 8.5   | 8.54  | 8.55  |
| Resistance (%)                            |       |       |       |       |       |       |       |
| Sales of space heating units - Gas (%)    | 98.4  | 87.4  | 61.6  | 10.2  | 1.06  | 0.491 | 0.49  |
| Sales of space heating units - Fossil (%) | 0     | 0.208 | 0.04  | 0.002 | 0     | 0     | 0     |
| Sales of water heating units - Electric   | 0.008 | 1.61  | 16.7  | 45    | 50    | 50.3  | 50.3  |
| Heat Pump (%)                             |       |       |       |       |       |       |       |
| Sales of water heating units - Electric   | 0.41  | 2.69  | 16.3  | 44.1  | 49    | 49.3  | 49.3  |
| Resistance (%)                            |       |       |       |       |       |       |       |
| Sales of water heating units - Gas (%)    | 99.5  | 95.3  | 66.6  | 10.6  | 0.622 | 0     | 0     |
| Sales of water heating units - Other (%)  | 0.1   | 0.381 | 0.381 | 0.382 | 0.381 | 0.381 | 0.381 |
| Sales of cooking units - Electric         | 41.9  | 54.6  | 83    | 88.6  | 88.9  | 88.9  | 88.9  |
| Resistance (%)                            |       |       |       |       |       |       |       |
| Sales of cooking units - Gas (%)          | 58.1  | 45.4  | 17    | 11.4  | 11.1  | 11.1  | 11.1  |
| Commercial HVAC investment in 2020s -     |       | 7,533 | 8,381 |       |       |       |       |
| Cumulative 5-yr (million \$2018)          |       |       |       |       |       |       |       |

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

| Item  | 2020  | 2025  | 2030  | 2035   | 2040   | 2045   | 2050   |
|---|-------|-------|-------|--------|--------|--------|--------|
| Installed thermal - Coal (MW)   | 4,894 | 3,250 | 0     | 0      | 0      | 0      | 0      |
| Installed thermal - Natural gas (MW)                                    | 2,926 | 2,933 | 3,732 | 4,265  | 3,603  | 3,581  | 4,890  |
| Installed thermal - Nuclear (MW)  | 0     | 0     | 0     | 0      | 0      | 0      | 0      |
| Installed renewables - Rooftop PV (MW)                                  | 540   | 833   | 1,113 | 1,450  | 1,851  | 2,318  | 2,871  |
| Installed renewables - Solar - Base land use assumptions (MW)           | 768   | 768   | 768   | 768    | 768    | 768    | 1,335  |
| Installed renewables - Wind - Base land use assumptions (MW)            | 547   | 717   | 6,391 | 10,963 | 12,838 | 13,762 | 16,825 |
| Installed renewables - Solar -<br>Constrained land use assumptions (MW) | 767   | 767   | 767   | 767    | 7,665  | 8,703  | 9,779  |
| Installed renewables - Wind - Constrained land use assumptions (MW)     | 1,234 | 1,969 | 7,960 | 12,142 | 13,037 | 13,410 | 15,929 |
| Capital invested - Solar PV - Base (billion \$2018)                     |       | 0     | 0     | 0      | 0      | 0      | 0.525  |
| Capital invested - Wind - Base (billion<br>\$2018)                      |       | 0.251 | 7.55  | 5.67   | 2.22   | 1.04   | 3.24   |

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)          |      | 1.09  | 0     | 0    | 2.18  | 2.6   | 1.2   |
| Capital invested - Wind - Constrained (billion \$2018)              |      | 0.199 | 7.9   | 6.7  | 0.918 | 0.419 | 2.7   |
| Capital invested - Biomass power plant (billion \$2018)             | 0    | 0.003 | 0.029 | 0    | 0     | 0     | 0     |
| Capital invested - Biomass w/ccu allam power plant (billion \$2018) | 0    | 0     | 0     | 0    | 0     | 0     | 0     |
| Capital invested - Biomass w/ccu power plant (billion \$2018)       | 0    | 0     | 0     | 0    | 0     | 0     | 0.377 |

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

| Item                                     | 2020  | 2025  | 2030   | 2035   | 2040   | 2045   | 2050   |
|--|-------|-------|--------|--------|--------|--------|--------|
| Solar - Base land use assumptions (GWh)  | 2,042 | 2,042 | 2,042  | 2,042  | 2,042  | 2,042  | 3,288  |
| Wind - Base land use assumptions (GWh)   | 1,617 | 2,124 | 18,149 | 30,651 | 35,589 | 38,005 | 46,263 |
| OffshoreWind - Base land use             | 0     | 0     | 0      | 0      | 0      | 0      | 0      |
| assumptions (GWh)                        |       |       |        |        |        |        |        |
| Solar - Constrained land use assumptions | 2,037 | 2,037 | 2,037  | 2,037  | 17,645 | 20,004 | 22,417 |
| (GWh)                                    |       |       |        |        |        |        |        |
| Wind - Constrained land use assumptions  | 3,563 | 5,645 | 21,170 | 30,795 | 32,849 | 33,673 | 39,164 |
| (GWh)                                    |       |       |        |        |        |        |        |
| OffshoreWind - Constrained land use      | 0     | 0     | 0      | 0      | 0      | 0      | 0      |
| assumptions (GWh)                        |       |       |        |        |        |        |        |
| Biomass power plant (GWh)                | 0     | 4.9   | 61.8   | 61.8   | 61.8   | 61.8   | 61.8   |
| Biomass w/ccu power plant (GWh)          | 0     | 0     | 0      | 0      | 0      | 0      | 423    |
| Biomass w/ccu allam power plant (GWh)    | 0     | 0     | 0      | 0      | 0      | 0      | 0      |

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

| Item   | 2020 | 2025  | 2030 | 2035 | 2040 | 2045  | 2050 |
|--|------|-------|------|------|------|-------|------|
| Number of facilities - Power (quantity)      | 0    | 1     | 1    | 1    | 1    | 1     | 1    |
| Number of facilities - Power ccu             | 0    | 0     | 0    | 0    | 0    | 0     | 1    |
| (quantity)                                   |      |       |      |      |      |       |      |
| Number of facilities - Allam power w ccu     | 0    | 0     | 0    | 0    | 0    | 0     | 0    |
| (quantity)                                   |      |       |      |      |      |       |      |
| Number of facilities - Beccs hydrogen        | 0    | 0     | 0    | 0    | 0    | 0     | 0    |
| (quantity)                                   |      |       |      |      |      |       |      |
| Number of facilities - Diesel (quantity)     | 0    | 0     | 0    | 1    | 1    | 1     | 1    |
| Number of facilities - Diesel ccu (quantity) | 0    | 0     | 0    | 0    | 0    | 0     | 0    |
| Number of facilities - Pyrolysis (quantity)  | 0    | 0     | 0    | 1    | 1    | 1     | 1    |
| Number of facilities - Pyrolysis ccu         | 0    | 0     | 0    | 0    | 0    | 0     | 0    |
| (quantity)                                   |      |       |      |      |      |       |      |
| Number of facilities - Sng (quantity)        | 0    | 1     | 1    | 1    | 1    | 1     | 1    |
| Number of facilities - Sng ccu (quantity)    | 0    | 0     | 0    | 0    | 0    | 0     | 0    |
| Conversion capital investment -              |      | 2.83  | 32.3 | 18.6 | 2.91 | 0.542 | 346  |
| Cumulative 5-yr (million \$2018)             |      |       |      |      |      |       |      |
| Biomass purchases (million \$2018/y)         |      | 0.333 | 3.78 | 4.99 | 5.18 | 5.22  | 26.6 |

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

| Item                               | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|------------------------------------|------|------|------|------|------|------|------|
| Annual - All (MMT)                 |      | 0    | 0    | 0    | 0    | 0    | 0.4  |
| Annual - BECCS (MMT)               |      | 0    | 0    | 0    | 0    | 0    | 0.4  |
| Annual - NGCC (MMT)                |      | 0    | 0    | 0    | 0    | 0    | 0    |
| Annual - Cement and lime (MMT)     |      | 0    | 0    | 0    | 0    | 0    | 0    |
| Cumulative - All (MMT)             |      | 0    | 0    | 0    | 0    | 0    | 0.4  |
| Cumulative - BECCS (MMT)           |      | 0    | 0    | 0    | 0    | 0    | 0.4  |
| Cumulative - NGCC (MMT)            |      | 0    | 0    | 0    | 0    | 0    | 0    |
| Cumulative - Cement and lime (MMT) |      | 0    | 0    | 0    | 0    | 0    | 0    |

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

| Item  | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|------|------|------|------|------|------|------|
| Trunk (km)                                      |      | 0    | 0    | 0    | 0    | 0    | 0    |
| Spur (km)                                       |      | 0    | 0    | 0    | 0    | 0    | 22.6 |
| All (km)  |      | 0    | 0    | 0    | 0    | 0    | 22.6 |
| Cumulative investment - Trunk (million \$2018)  |      | 0    | 0    | 0    | 0    | 0    | 0    |
| Cumulative investment - Spur (million \$2018)   |      | 0    | 0    | 0    | 0    | 0    | 13.5 |
| Cumulative investment - All (million<br>\$2018) |      | 0    | 0    | 0    | 0    | 0    | 13.5 |

### 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    | 0    | 0    |
| Resource characterization, appraisal, permitting costs (million \$2020) |      | 0    | 0    | 0    | 0    | 0    | 0    |
| Wells and facilities construction costs (million \$2020)                |      | 0    | 0    | 0    | 0    | 0    | 0    |

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

| Item                                     | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050   |
|--|------|------|------|------|------|------|--------|
| Carbon sink potential - Low - Accelerate |      |      |      |      |      |      | -707   |
| regeneration (1000 tCO2e/y)              |      |      |      |      |      |      |        |
| Carbon sink potential - Low - Avoid      |      |      |      |      |      |      | -140   |
| deforestation (1000 tCO2e/y)             |      |      |      |      |      |      |        |
| Carbon sink potential - Low - Extend     |      |      |      |      |      |      | -2,919 |
| rotation length (1000 tCO2e/y)           |      |      |      |      |      |      |        |
| Carbon sink potential - Low - Improve    |      |      |      |      |      |      | -5.38  |
| plantations (1000 tCO2e/y)               |      |      |      |      |      |      |        |
| Carbon sink potential - Low - Increase   |      |      |      |      |      |      | -9.92  |
| retention of HWP (1000 tCO2e/y)          |      |      |      |      |      |      |        |
| Carbon sink potential - Low - Increase   |      |      |      |      |      |      | -116   |
| trees outside forests (1000 tC02e/y)     |      |      |      |      |      |      |        |
| Carbon sink potential - Low - Reforest   |      |      |      |      |      |      | -1,189 |
| cropland (1000 tCO2e/y)                  |      |      |      |      |      |      |        |
| Carbon sink potential - Low - Reforest   |      |      |      |      |      |      | -101   |
| pasture (1000 tCO2e/y)                   |      |      |      |      |      |      |        |
| Carbon sink potential - Low - Restore    |      |      |      |      |      |      | -1,568 |
| productivity (1000 tCO2e/y)              |      |      |      |      |      |      |        |
| Carbon sink potential - Low - All (not   |      |      |      |      |      |      | -6,755 |
| counting overlap) (1000 tCO2e/y)         |      |      |      |      |      |      |        |
| Carbon sink potential - Mid - Accelerate |      |      |      |      |      |      | -1,060 |
| regeneration (1000 tCO2e/y)              |      |      |      |      |      |      |        |
| Carbon sink potential - Mid - Avoid      |      |      |      |      |      |      | -489   |
| deforestation (1000 tCO2e/y)             |      |      |      |      |      |      |        |
| Carbon sink potential - Mid - Extend     |      |      |      |      |      |      | -5,260 |
| rotation length (1000 tCO2e/y)           |      |      |      |      |      |      |        |
| Carbon sink potential - Mid - Improve    |      |      |      |      |      |      | -7.89  |
| plantations (1000 tCO2e/y)               |      |      |      |      |      |      |        |
| Carbon sink potential - Mid - Increase   |      |      |      |      |      |      | -19.8  |
| retention of HWP (1000 tCO2e/y)          |      |      |      |      |      |      |        |
| Carbon sink potential - Mid - Increase   |      |      |      |      |      |      | -224   |
| trees outside forests (1000 tCO2e/y)     |      |      |      |      |      |      |        |
| Carbon sink potential - Mid - Reforest   |      |      |      |      |      |      | -1,783 |
| cropland (1000 tCO2e/y)                  |      |      |      |      |      |      | .,. 00 |

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

| Item                                      | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050    |
|---|------|------|------|------|------|------|---------|
| Carbon sink potential - Mid - Reforest    |      |      |      |      |      |      | -715    |
| pasture (1000 tCO2e/y)                    |      |      |      |      |      |      |         |
| Carbon sink potential - Mid - Restore     |      |      |      |      |      |      | -3,109  |
| productivity (1000 tC02e/y)               |      |      |      |      |      |      |         |
| Carbon sink potential - Mid - All (not    |      |      |      |      |      |      | -12,667 |
| counting overlap) (1000 tCO2e/y)          |      |      |      |      |      |      |         |
| Carbon sink potential - High - Accelerate |      |      |      |      |      |      | -1,412  |
| regeneration (1000 tCO2e/y)               |      |      |      |      |      |      |         |
| Carbon sink potential - High - Avoid      |      |      |      |      |      |      | -838    |
| deforestation (1000 tCO2e/y)              |      |      |      |      |      |      |         |
| Carbon sink potential - High - Extend     |      |      |      |      |      |      | -7,600  |
| rotation length (1000 tC02e/y)            |      |      |      |      |      |      |         |
| Carbon sink potential - High - Improve    |      |      |      |      |      |      | -10.6   |
| plantations (1000 tC02e/y)                |      |      |      |      |      |      |         |
| Carbon sink potential - High - Increase   |      |      |      |      |      |      | -29.8   |
| retention of HWP (1000 tCO2e/y)           |      |      |      |      |      |      |         |
| Carbon sink potential - High - Increase   |      |      |      |      |      |      | -332    |
| trees outside forests (1000 tCO2e/y)      |      |      |      |      |      |      |         |
| Carbon sink potential - High - Reforest   |      |      |      |      |      |      | -2,378  |
| cropland (1000 tCO2e/y)                   |      |      |      |      |      |      |         |
| Carbon sink potential - High - Reforest   |      |      |      |      |      |      | -1,329  |
| pasture (1000 tCO2e/y)                    |      |      |      |      |      |      |         |
| Carbon sink potential - High - All (not   |      |      |      |      |      |      | -18,580 |
| counting overlap) (1000 tCO2e/y)          |      |      |      |      |      |      |         |
| Carbon sink potential - High - Restore    |      |      |      |      |      |      | -4,651  |
| productivity (1000 tCO2e/y)               |      |      |      |      |      |      |         |
| Land impacted for carbon sink potential - |      |      |      |      |      |      | 116     |
| Low - Accelerate regeneration (1000       |      |      |      |      |      |      |         |
| hectares)                                 |      |      |      |      |      |      |         |
| Land impacted for carbon sink potential - |      |      |      |      |      |      | 106     |
| Low - Avoid deforestation (over 30 years) |      |      |      |      |      |      |         |
| (1000 hectares)                           |      |      |      |      |      |      |         |
| Land impacted for carbon sink potential - |      |      |      |      |      |      | 1,485   |
| Low - Extend rotation length (1000        |      |      |      |      |      |      | .,      |
| hectares)                                 |      |      |      |      |      |      |         |
| Land impacted for carbon sink potential - |      |      |      |      |      |      | 1.95    |
| Low - Improve plantations (1000           |      |      |      |      |      |      | 11.70   |
| hectares)                                 |      |      |      |      |      |      |         |
| Land impacted for carbon sink potential - |      |      |      |      |      |      | 0       |
| Low - Increase retention of HWP (1000     |      |      |      |      |      |      | U       |
| hectares)                                 |      |      |      |      |      |      |         |
| Land impacted for carbon sink potential - |      |      |      |      |      |      | 16.6    |
| Low - Increase trees outside forests      |      |      |      |      |      |      | 10.0    |
| (1000 hectares)                           |      |      |      |      |      |      |         |
| Land impacted for carbon sink potential - |      |      |      |      |      |      | 78.6    |
| Low - Reforest cropland (1000 hectares)   |      |      |      |      |      |      | 10.0    |
| Land impacted for carbon sink potential - | +    |      |      |      |      |      | 6.55    |
| Low - Reforest pasture (1000 hectares)    |      |      |      |      |      |      | 6.33    |
|   |      |      |      |      |      |      | 933     |
| Land impacted for carbon sink potential - |      |      |      |      |      |      | 933     |
| Low - Restore productivity (1000          |      |      |      |      |      |      |         |
| hectares)                                 |      |      |      |      |      |      | 0.7/.0  |
| Land impacted for carbon sink potential - |      |      |      |      |      |      | 2,743   |
| Low - Total impacted (over 30 years)      |      |      |      |      |      |      |         |
| (1000 hectares)                           |      |      |      |      |      |      |         |
| Land impacted for carbon sink potential - |      |      |      |      |      |      | 173     |
| Mid - Accelerate regeneration (1000       |      |      |      |      |      |      |         |
| hectares)                                 |      |      |      |      |      |      |         |
| Land impacted for carbon sink potential - |      |      |      |      |      |      | 110     |
| Mid - Avoid deforestation (over 30 years) |      |      |      |      |      |      |         |
| (1000 hectares)                           |      |      |      |      |      |      |         |

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

| Item                                       | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050  |
|--|------|------|------|------|------|------|-------|
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 2,680 |
| Mid - Extend rotation length (1000         |      |      |      |      |      |      |       |
| hectares)                                  |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 2.93  |
| Mid - Improve plantations (1000 hectares)  |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 0     |
| Mid - Increase retention of HWP (1000      |      |      |      |      |      |      |       |
| hectares)                                  |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 24.1  |
| Mid - Increase trees outside forests (1000 |      |      |      |      |      |      |       |
| hectares)                                  |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 118   |
| Mid - Reforest cropland (1000 hectares)    |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 47.3  |
| Mid - Reforest pasture (1000 hectares)     |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 1,879 |
| Mid - Restore productivity (1000           |      |      |      |      |      |      |       |
| hectares)                                  |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 5,034 |
| Mid - Total impacted (over 30 years) (1000 |      |      |      |      |      |      |       |
| hectares)                                  |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 231   |
| High - Accelerate regeneration (1000       |      |      |      |      |      |      |       |
| hectares)                                  |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 113   |
| High - Avoid deforestation (over 30 years) |      |      |      |      |      |      |       |
| (1000 hectares)                            |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 3,876 |
| High - Extend rotation length (1000        |      |      |      |      |      |      |       |
| hectares)                                  |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 3.9   |
| High - Improve plantations (1000           |      |      |      |      |      |      |       |
| hectares)                                  |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 0     |
| High - Increase retention of HWP (1000     |      |      |      |      |      |      |       |
| hectares)                                  |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 31.5  |
| High - Increase trees outside forests      |      |      |      |      |      |      |       |
| (1000 hectares)                            |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 157   |
| High - Reforest cropland (1000 hectares)   |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 37.8  |
| High - Reforest pasture (1000 hectares)    |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 1,542 |
| High - Restore productivity (1000          |      |      |      |      |      |      |       |
| hectares)                                  |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 5,992 |
| High - Total impacted (over 30 years)      |      |      |      |      |      |      | •     |
| (1000 hectares)                            |      |      |      |      |      |      |       |

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

| Item                                 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--------------------------------------|------|------|------|------|------|------|------|
| Carbon sink potential - Moderate     |      |      |      |      |      |      | 0    |
| deployment - Corn-ethanol to energy  |      |      |      |      |      |      |      |
| grasses (1000 tCO2e/y)               |      |      |      |      |      |      |      |
| Carbon sink potential - Moderate     |      |      |      |      |      |      | -184 |
| deployment - Cropland measures (1000 |      |      |      |      |      |      |      |
| tCO2e/y)                             |      |      |      |      |      |      |      |

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

| Table 10. L+ Scenario - PILLAN O. Lana Sink |      | •     | -     |       |       |       |       |
|---|------|-------|-------|-------|-------|-------|-------|
| Item  | 2020 | 2025  | 2030  | 2035  | 2040  | 2045  | 2050  |
| Carbon sink potential - Moderate            |      |       |       |       |       |       | -7.84 |
| deployment - Permanent conservation         |      |       |       |       |       |       |       |
| cover (1000 tC02e/y)                        |      |       |       |       |       |       |       |
| Carbon sink potential - Moderate            |      |       |       |       |       |       | -192  |
| deployment - Total (1000 tCO2e/y)           |      |       |       |       |       |       |       |
| Carbon sink potential - Aggressive          |      |       |       |       |       |       | 0     |
| deployment - Corn-ethanol to energy         |      |       |       |       |       |       |       |
| grasses (1000 tCO2e/y)                      |      |       |       |       |       |       |       |
| Carbon sink potential - Aggressive          |      |       |       |       |       |       | -360  |
| deployment - Cropland measures (1000        |      |       |       |       |       |       |       |
| tCO2e/y)                                    |      |       |       |       |       |       |       |
| Carbon sink potential - Aggressive          |      |       |       |       |       |       | -15.7 |
| deployment - Permanent conservation         |      |       |       |       |       |       |       |
| cover (1000 tCO2e/y)                        |      |       |       |       |       |       |       |
| Carbon sink potential - Aggressive          |      |       |       |       |       |       | -376  |
| deployment - Total (1000 tCO2e/y)           |      |       |       |       |       |       |       |
| Land impacted for carbon sink - Moderate    |      |       |       |       |       |       | 0     |
| deployment - Corn-ethanol to energy         |      |       |       |       |       |       |       |
| grasses (1000 hectares)                     |      |       |       |       |       |       |       |
| Land impacted for carbon sink - Moderate    |      |       |       |       |       |       | 329   |
| deployment - Cropland measures (1000        |      |       |       |       |       |       |       |
| hectares)                                   |      |       |       |       |       |       |       |
| Land impacted for carbon sink - Moderate    |      |       |       |       |       |       | 12.1  |
| deployment - Permanent conservation         |      |       |       |       |       |       |       |
| cover (1000 hectares)                       |      |       |       |       |       |       |       |
| Land impacted for carbon sink - Moderate    |      |       |       |       |       |       | 341   |
| deployment - Total (1000 hectares)          |      |       |       |       |       |       | 0-11  |
| Land impacted for carbon sink -             |      |       |       |       |       |       | 0     |
| Aggressive deployment - Corn-ethanol to     |      |       |       |       |       |       | U     |
| energy grasses (1000 hectares)              |      |       |       |       |       |       |       |
| Land impacted for carbon sink -             |      |       |       |       |       |       | 646   |
| Aggressive deployment - Cropland            |      |       |       |       |       |       | 040   |
| measures (1000 hectares)                    |      |       |       |       |       |       |       |
| Land impacted for carbon sink -             |      |       |       |       |       |       | 24.1  |
|   |      |       |       |       |       |       | 24.1  |
| Aggressive deployment - Permanent           |      |       |       |       |       |       |       |
| conservation cover (1000 hectares)          |      |       |       |       |       |       | /70   |
| Land impacted for carbon sink -             |      |       |       |       |       |       | 670   |
| Aggressive deployment - Total (1000         |      |       |       |       |       |       |       |
| hectares)                                   |      |       |       |       |       |       |       |
|   |      |       |       |       |       |       |       |
|   |      |       |       |       |       |       |       |
| Table 17: E- scenario - IMPACTS - Health    |      |       |       |       |       |       |       |
| Item  | 2020 | 2025  | 2030  | 2035  | 2040  | 2045  | 2050  |
| Premature deaths from air pollution -       |      | 17.8  | 0.021 | 0.021 | 0.018 | 0.012 | 0     |
| Fuel Comb - Electric Generation - Coal      |      |       |       |       |       |       |       |
| (deaths)                                    |      |       |       |       |       |       |       |
| Premature deaths from air pollution -       |      | 4.79  | 2.42  | 1.68  | 0.983 | 0.467 | 0.563 |
| Fuel Comb - Electric Generation - Natural   |      |       |       |       |       |       |       |
| Gas (deaths)                                |      |       |       |       |       |       |       |
| Premature deaths from air pollution -       |      | 85.1  | 89.6  | 90.6  | 84.5  | 69.4  | 49.1  |
| Mobile - On-Road (deaths)                   |      |       |       |       |       |       |       |
| Premature deaths from air pollution - Gas   |      | 4.01  | 4.21  | 4.23  | 3.95  | 3.28  | 2.4   |
| Stations (deaths)                           |      |       |       | 20    | 0.70  | 0.20  |       |
| Premature deaths from air pollution -       |      | 16.7  | 16.8  | 16.6  | 15.4  | 12.8  | 9.15  |
| Fuel Comb - Residential - Natural Gas       |      | 10.1  | 10.0  | 10.0  | 13.4  | 12.0  | 7.10  |
| (deaths)                                    |      |       |       |       |       |       |       |
| Premature deaths from air pollution -       |      | 0.078 | 0.076 | 0.071 | 0.063 | 0.054 | 0.045 |
| ·   |      | 0.078 | 0.076 | 0.071 | 0.063 | 0.054 | 0.045 |
| Fuel Comb - Residential - Oil (deaths)      |      | 0.701 | 0.770 | 0.744 | 0.700 | 0.744 | 0 / 0 |
| Premature deaths from air pollution -       |      | 0.631 | 0.673 | 0.711 | 0.702 | 0.611 | 0.48  |
| Fuel Comb - Residential - Other (deaths)    |      |       |       |       |       |       |       |
|   |      |       |       |       |       |       |       |

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

| Table 11. E- Scellul 10 - IMPAGI 3 - Heultil (C     | •    |       |       |       |       |       |       |
|---|------|-------|-------|-------|-------|-------|-------|
| Item  | 2020 | 2025  | 2030  | 2035  | 2040  | 2045  | 2050  |
| Premature deaths from air pollution -               |      | 0.053 | 0.053 | 0.052 | 0.051 | 0.05  | 0.048 |
| Fuel Comb - Comm/Institutional - Coal               |      |       |       |       |       |       |       |
| (deaths)  |      |       |       |       |       |       |       |
| Premature deaths from air pollution -               |      | 5.21  | 5.24  | 5.16  | 4.79  | 4.06  | 3.09  |
| Fuel Comb - Comm/Institutional - Natural            |      |       |       |       |       |       |       |
| Gas (deaths)  |      |       |       |       |       |       |       |
| Premature deaths from air pollution -               |      | 0.423 | 0.377 | 0.337 | 0.299 | 0.261 | 0.224 |
| Fuel Comb - Comm/Institutional - Oil                |      |       |       |       |       |       |       |
| (deaths)  |      |       |       |       |       |       |       |
| Premature deaths from air pollution -               |      | 0.842 | 0.787 | 0.727 | 0.66  | 0.588 | 0.516 |
| Fuel Comb - Comm/Institutional - Other              |      |       |       |       |       |       |       |
| (deaths)  |      | 2.1=2 |       | 2.22  |       |       |       |
| Premature deaths from air pollution -               |      | 0.178 | 0.026 | 0.026 | 0.025 | 0.021 | 0.014 |
| Industrial Processes - Coal Mining                  |      |       |       |       |       |       |       |
| (deaths)  |      |       |       |       |       |       |       |
| Premature deaths from air pollution -               |      | 21.4  | 19.9  | 17.7  | 15.9  | 14.3  | 10.3  |
| Industrial Processes - Oil & Gas                    |      |       |       |       |       |       |       |
| Production (deaths)                                 |      |       |       |       |       |       |       |
| Monetary damages from air pollution -               |      | 158   | 0.183 | 0.183 | 0.163 | 0.107 | 0     |
| Fuel Comb - Electric Generation - Coal              |      |       |       |       |       |       |       |
| (million \$2019)                                    |      |       |       | 11.0  |       |       |       |
| Monetary damages from air pollution -               |      | 42.5  | 21.4  | 14.9  | 8.71  | 4.13  | 4.99  |
| Fuel Comb - Electric Generation - Natural           |      |       |       |       |       |       |       |
| Gas (million \$2019)                                |      | 757   | 70.   | 001   | 754   | (47   |       |
| Monetary damages from air pollution -               |      | 757   | 796   | 806   | 751   | 617   | 436   |
| Mobile - On-Road (million \$2019)                   |      |       | 07.0  | 07.5  | 01.0  |       | 04.0  |
| Monetary damages from air pollution -               |      | 35.5  | 37.3  | 37.5  | 34.9  | 29    | 21.3  |
| Gas Stations (million \$2019)                       |      | 1/ 0  | 1/0   | 1/7   | 107   | 110   | 01.1  |
| Monetary damages from air pollution -               |      | 148   | 149   | 147   | 137   | 113   | 81.1  |
| Fuel Comb - Residential - Natural Gas               |      |       |       |       |       |       |       |
| (million \$2019)                                    |      | 0.701 | 0 (7) | 0.400 | 0.555 | 0.40  | 0.400 |
| Monetary damages from air pollution -               |      | 0.691 | 0.676 | 0.629 | 0.555 | 0.48  | 0.402 |
| Fuel Comb - Residential - Oil (million<br>\$2019)   |      |       |       |       |       |       |       |
|   |      | F F0  | 5.96  | ( )   | 4.00  | Г / 1 | 4.25  |
| Monetary damages from air pollution -               |      | 5.59  | 5.96  | 6.3   | 6.22  | 5.41  | 4.25  |
| Fuel Comb - Residential - Other (million<br>\$2019) |      |       |       |       |       |       |       |
| Monetary damages from air pollution -               |      | 0.473 | 0.47  | 0.463 | 0.453 | 0.439 | 0.422 |
| Fuel Comb - Comm/Institutional - Coal               |      | 0.473 | 0.47  | 0.463 | 0.453 | 0.439 | 0.422 |
| (million \$2019)                                    |      |       |       |       |       |       |       |
| Monetary damages from air pollution -               |      | 46.1  | 46.4  | 45.6  | 42.4  | 35.9  | 27.4  |
| Fuel Comb - Comm/Institutional - Natural            |      | 46.1  | 46.4  | 45.6  | 42.4  | 35.9  | 21.4  |
| Gas (million \$2019)                                |      |       |       |       |       |       |       |
| Monetary damages from air pollution -               |      | 3.75  | 3.34  | 2.99  | 2.64  | 2.31  | 1.98  |
| Fuel Comb - Comm/Institutional - Oil                |      | 3.13  | 3.34  | 2.77  | 2.04  | 2.31  | 1.70  |
| (million \$2019)                                    |      |       |       |       |       |       |       |
| Monetary damages from air pollution -               |      | 7.46  | 6.96  | 6.43  | 5.84  | 5.21  | 4.56  |
| Fuel Comb - Comm/Institutional - Other              |      | 1.40  | 0.90  | 0.43  | 5.64  | 5.21  | 4.50  |
| (million \$2019)                                    |      |       |       |       |       |       |       |
| Monetary damages from air pollution -               |      | 1.57  | 0.228 | 0.228 | 0.219 | 0.186 | 0.128 |
| Industrial Processes - Coal Mining                  |      | 1.51  | 0.220 | 0.220 | 0.217 | 0.100 | 0.120 |
| (million \$2019)                                    |      |       | [     |       |       |       |       |
| Monetary damages from air pollution -               |      | 190   | 177   | 157   | 141   | 127   | 91    |
| i ionotar y damagoo n om an ponduon                 |      | 170   | 111   | 101   | 171   | 141   | 71    |
| Industrial Processes - Oil & Gas                    |      |       | ļ     |       |       |       |       |

Table 18: E- scenario - IMPACTS - Jobs

| Item                                     | 2020 | 2025  | 2030  | 2035  | 2040  | 2045  | 2050  |
|--|------|-------|-------|-------|-------|-------|-------|
| By economic sector - Agriculture (jobs)  |      | 5.12  | 22.7  | 13.9  | 11.1  | 7.08  | 17.3  |
| By economic sector - Construction (jobs) |      | 4,754 | 6,706 | 5,981 | 5,730 | 6,203 | 7,759 |

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

| Table 18: E- Scellullo - IMPAG13 - Jobs (Colli | шиеиј |        |          |        |        |        |         |
|--|-------|--------|----------|--------|--------|--------|---------|
| Item   | 2020  | 2025   | 2030     | 2035   | 2040   | 2045   | 2050    |
| By economic sector - Manufacturing             |       | 3,824  | 5,086    | 4,694  | 4,383  | 4,625  | 4,495   |
| (jobs)   |       |        |          |        |        |        |         |
| By economic sector - Mining (jobs)             |       | 4,894  | 3,412    | 2,565  | 1,927  | 1,446  | 889     |
| By economic sector - Other (jobs)              |       | 470    | 639      | 653    | 716    | 845    | 1,474   |
| By economic sector - Pipeline (jobs)           |       | 402    | 348      | 299    | 261    | 225    | 166     |
| By economic sector - Professional (jobs)       |       | 2,731  | 3,442    | 3,076  | 3,073  | 3,453  | 4,526   |
| By economic sector - Trade (jobs)              |       | 2,766  | 2,764    | 2,491  | 2,387  | 2,517  | 3,149   |
| By economic sector - Utilities (jobs)          |       | 3,880  | 6,933    | 5,327  | 4,760  | 5,292  | 5,618   |
| By resource sector - Biomass (jobs)            |       | 19.4   | 61.1     | 46.1   | 46.7   | 30.1   | 71.2    |
| By resource sector - CO2 (jobs)                |       | 0      | 0        | 0      | 0      | 0      | 50.5    |
| By resource sector - Coal (jobs)               |       | 2,642  | 1,041    | 532    | 464    | 414    | 360     |
| By resource sector - Grid (jobs)               |       | 4,635  | 12,021   | 9,474  | 8,253  | 9,314  | 10,134  |
| By resource sector - Natural Gas (jobs)        |       | 4,844  | 3,805    | 2,742  | 2,284  | 2,007  | 1,473   |
| By resource sector - Nuclear (jobs)            |       | 0      | 0        | 0      | 0      | 0      | 0       |
| By resource sector - Oil (jobs)                |       | 6,829  | 6,068    | 5,411  | 4,704  | 3,990  | 2,535   |
| By resource sector - Solar (jobs)              |       | 3,442  | 3,449    | 3,837  | 4,134  | 4,720  | 8,131   |
| By resource sector - Wind (jobs)               |       | 1,316  | 2,909    | 3,058  | 3,364  | 4,140  | 5,339   |
| By education level - All sectors - High        |       | 9,933  | 12,340   | 10,601 | 9,805  | 10,355 | 11,758  |
| school diploma or less (jobs)                  |       | ,,,,,, |          | ,      | 1,222  | ,      | ,       |
| By education level - All sectors -             |       | 7,157  | 9,141    | 7,800  | 7,256  | 7,759  | 8,968   |
| Associates degree or some college (jobs)       |       | 1,101  | ,,,,,    | 1,222  | ,,     | 1,101  | 7,      |
| By education level - All sectors -             |       | 5,222  | 6,191    | 5,269  | 4,858  | 5,091  | 5,728   |
| Bachelors degree (jobs)                        |       | -,     | ,,,,,    | 7,20   | ,,,,,  | 7,511  | -7      |
| By education level - All sectors - Masters     |       | 1,239  | 1,481    | 1,257  | 1,166  | 1,233  | 1,425   |
| or professional degree (jobs)                  |       | ,,     | ,,,,,,,  | ,,=0   | ,,,,,  | ,,     | .,      |
| By education level - All sectors - Doctoral    |       | 175    | 200      | 174    | 165    | 176    | 215     |
| degree (jobs)                                  |       |        |          |        |        |        |         |
| Related work experience - All sectors -        |       | 3,334  | 4,198    | 3,585  | 3,324  | 3,529  | 4,048   |
| None (jobs)                                    |       | ,,,,,  | ,,,,,    | 5,555  | ,,,,   | 5,521  | 1,2 12  |
| Related work experience - All sectors - Up     |       | 4,638  | 5,736    | 4,952  | 4,604  | 4,884  | 5,644   |
| to 1 year (jobs)                               |       | ,      | .,       | , -    | ,      | ,      | -,-     |
| Related work experience - All sectors - 1      |       | 8,739  | 10,701   | 9,134  | 8,448  | 8,921  | 10,130  |
| to 4 years (jobs)                              |       | -, -   | -, -     | , -    | -,     | -,     | -,      |
| Related work experience - All sectors - 4      |       | 5,511  | 6,859    | 5,843  | 5,413  | 5,739  | 6,543   |
| to 10 years (jobs)                             |       | -,-    |          | .,.    | -,     | , -    | .,.     |
| Related work experience - All sectors -        |       | 1,505  | 1,860    | 1,585  | 1,461  | 1,542  | 1,729   |
| Over 10 years (jobs)                           |       | ,      | ,        | ,      | , -    | ,-     | •       |
| On-the-Job Training - All sectors - None       |       | 1,304  | 1,563    | 1,344  | 1,248  | 1,316  | 1,529   |
| (jobs)   |       |        | .        | -      | -      |        |         |
| On-the-Job Training - All sectors - Up to 1    |       | 15,923 | 19,471   | 16,679 | 15,431 | 16,288 | 18,469  |
| year (jobs)                                    |       | ,      | <i>,</i> | , -    | -, -   | -,     | -,      |
| On-the-Job Training - All sectors - 1 to 4     |       | 4,843  | 6,159    | 5,238  | 4,855  | 5,169  | 5,928   |
| years (jobs)                                   |       |        | ,        |        |        |        | ,       |
| On-the-Job Training - All sectors - 4 to 10    |       | 1,431  | 1,884    | 1,597  | 1,492  | 1,605  | 1,897   |
| years (jobs)                                   |       | , -    | ,        | ,-     | ,      | ,      | ,-      |
| On-the-Job Training - All sectors - Over 10    |       | 226    | 277      | 241    | 224    | 237    | 271     |
| years (jobs)                                   |       |        |          |        |        |        |         |
| On-Site or In-Plant Training - All sectors -   |       | 3,774  | 4,655    | 3,995  | 3,717  | 3,946  | 4,566   |
| None (jobs)                                    |       | -,     | ,        | ,      | -,     | ,      | ,       |
| On-Site or In-Plant Training - All sectors -   |       | 14,464 | 17,701   | 15,151 | 14,009 | 14,786 | 16,760  |
| Up to 1 year (jobs)                            |       |        | .        | ,      | ,      | .      | •       |
| On-Site or In-Plant Training - All sectors -   |       | 3,793  | 4,798    | 4,089  | 3,788  | 4,025  | 4,603   |
| 1 to 4 years (jobs)                            |       | ,,,,,  | ,,,,,    | ,,,,,  | 7,     | 1,525  | .,      |
| On-Site or In-Plant Training - All sectors -   |       | 1,513  | 1,952    | 1,655  | 1,541  | 1,647  | 1,920   |
| 4 to 10 years (jobs)                           |       | .,0.0  | .,, 52   | .,000  | .,     | .,     | .,. = 0 |
| On-Site or In-Plant Training - All sectors -   |       | 183    | 247      | 210    | 196    | 212    | 245     |
| Over 10 years (jobs)                           |       | .55    |          |        | .,,    | -:-    |         |
| Wage income - All (million \$2019)             |       | 1,284  | 1,594    | 1,368  | 1,276  | 1,361  | 1,553   |
|  |       | 1,204  | 1,074    | .,000  | 1,210  | .,001  | .,000   |

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

| Item                                   | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|------|------|------|------|------|------|------|
| Final energy use - Transportation (PJ) | 304  | 292  | 270  | 253  | 241  | 225  | 207  |
| Final energy use - Residential (PJ)    | 126  | 122  | 121  | 118  | 114  | 105  | 94.6 |
| Final energy use - Commercial (PJ)     | 103  | 103  | 103  | 102  | 99.5 | 96.4 | 92.8 |
| Final energy use - Industry (PJ)       | 86.5 | 89.4 | 90.4 | 97.9 | 112  | 117  | 124  |

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

| Item  | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|------|------|------|------|------|------|------|
| Electricity distribution capital invested - |      | 1.43 | 1.48 | 1.97 | 2.07 | 2.75 | 2.92 |
| Cumulative 5-yr (billion \$2018)            |      |      |      |      |      |      |      |

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

| Item   | 2020  | 2025  | 2030  | 2035  | 2040  | 2045  | 2050  |
|--|-------|-------|-------|-------|-------|-------|-------|
| Vehicle stocks - LDV – EV (1000 units)   | 37.7  | 93.7  | 150   | 410   | 669   | 1,244 | 1,819 |
| Vehicle stocks - LDV – All others (1000 units)                                 | 2,378 | 2,378 | 2,378 | 2,256 | 2,134 | 1,644 | 1,155 |
| Light-duty vehicle capital costs vs. REF -<br>Cumulative 5-yr (million \$2018) |       | 0     | 76.1  | 152   | 522   | 1,618 | 2,366 |
| Public EV charging plugs - DC Fast (1000 units)                                | 0.174 |       | 0.26  |       | 1.16  |       | 3.16  |
| Public EV charging plugs - L2 (1000 units)                                     | 1.07  |       | 6.25  |       | 27.9  |       | 75.9  |

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

| 2020  | 2025   | 2030  | 2035  | 2040   | 2045  | 2050   |
|-------|--|---|---|--|---|--|
| 3.03  | 8.14   | 10.8  | 19.7  | 39.7   | 63.6  | 77.1   |
|       |  |   |   |  |   |  |
| 3.81  | 7.45   | 7.24  | 6.69  | 5.41   | 3.74  | 2.75   |
|       |  |   |   |  |   |  |
| 89.6  | 75.1   | 72.6  | 64.6  | 46.5   | 25  | 12.6   |
| 3.57  | 9.27   | 9.34  | 9.11  | 8.39   | 7.66  | 7.61   |
| 0     | 0.562  | 2.11  | 7.14  | 18.6   | 32.3  | 40.2   |
|       |  |   |   |  |   |  |
| 7.01  | 15.2   | 16.4  | 20.2  | 29.3   | 40.6  | 47.3   |
|       |  |   |   |  |   |  |
| 92.3  | 83.4   | 80.7  | 71.9  | 51.3   | 26.3  | 11.8   |
|       |  |   |   |  |   |  |
| 0.642 | 0.79   | 0.789   | 0.787   | 0.783  | 0.781   | 0.778  |
| 36.9  | 38.5   | 44.3  | 59.5  | 80.7   | 93.8  | 98.3   |
|       |  |   |   |  |   |  |
| 63.1  | 61.5   | 55.7  | 40.5  | 19.3   | 6.23  | 1.68   |
|       | 2.75   | 3.16  |   |  |   |  |
|       |  |   |   |  |   |  |
|       | 3.03<br>3.81<br>89.6<br>3.57<br>0<br>7.01<br>92.3<br>0.642<br>36.9 | 3.03 8.14  3.81 7.45  89.6 75.1  3.57 9.27  0 0.562  7.01 15.2  92.3 83.4  0.642 0.79  36.9 38.5  63.1 61.5 | 3.03     8.14     10.8       3.81     7.45     7.24       89.6     75.1     72.6       3.57     9.27     9.34       0     0.562     2.11       7.01     15.2     16.4       92.3     83.4     80.7       0.642     0.79     0.789       36.9     38.5     44.3       63.1     61.5     55.7 | 3.03     8.14     10.8     19.7       3.81     7.45     7.24     6.69       89.6     75.1     72.6     64.6       3.57     9.27     9.34     9.11       0     0.562     2.11     7.14       7.01     15.2     16.4     20.2       92.3     83.4     80.7     71.9       0.642     0.79     0.789     0.787       36.9     38.5     44.3     59.5       63.1     61.5     55.7     40.5 | 3.03     8.14     10.8     19.7     39.7       3.81     7.45     7.24     6.69     5.41       89.6     75.1     72.6     64.6     46.5       3.57     9.27     9.34     9.11     8.39       0     0.562     2.11     7.14     18.6       7.01     15.2     16.4     20.2     29.3       92.3     83.4     80.7     71.9     51.3       0.642     0.79     0.789     0.787     0.783       36.9     38.5     44.3     59.5     80.7       63.1     61.5     55.7     40.5     19.3 | 3.03         8.14         10.8         19.7         39.7         63.6           3.81         7.45         7.24         6.69         5.41         3.74           89.6         75.1         72.6         64.6         46.5         25           3.57         9.27         9.34         9.11         8.39         7.66           0         0.562         2.11         7.14         18.6         32.3           7.01         15.2         16.4         20.2         29.3         40.6           92.3         83.4         80.7         71.9         51.3         26.3           0.642         0.79         0.789         0.787         0.783         0.781           36.9         38.5         44.3         59.5         80.7         93.8           63.1         61.5         55.7         40.5         19.3         6.23 |

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

| Item                                      | 2020  | 2025  | 2030  | 2035  | 2040  | 2045  | 2050  |
|---|-------|-------|-------|-------|-------|-------|-------|
| Sales of space heating units - Electric   | 0.749 | 7.59  | 10.3  | 19    | 39.5  | 64.5  | 79    |
| Heat Pump (%)                             |       |       |       |       |       |       |       |
| Sales of space heating units - Electric   | 0.855 | 3.35  | 3.5   | 4.01  | 5.26  | 6.85  | 7.79  |
| Resistance (%)                            |       |       |       |       |       |       |       |
| Sales of space heating units - Gas (%)    | 98.4  | 88.8  | 86    | 76.8  | 55.2  | 28.6  | 13.2  |
| Sales of space heating units - Fossil (%) | 0     | 0.241 | 0.225 | 0.172 | 0.092 | 0.04  | 0.021 |
| Sales of water heating units - Electric   | 0.008 | 0.63  | 2.29  | 7.68  | 20    | 34.8  | 43.4  |
| Heat Pump (%)                             |       |       |       |       |       |       |       |
| Sales of water heating units - Electric   | 0.41  | 2     | 3.48  | 8.38  | 19.9  | 34.2  | 42.5  |
| Resistance (%)                            |       |       |       |       |       |       |       |
| Sales of water heating units - Gas (%)    | 99.5  | 97    | 93.8  | 83.6  | 59.7  | 30.6  | 13.7  |
| Sales of water heating units - Other (%)  | 0.1   | 0.381 | 0.381 | 0.382 | 0.381 | 0.381 | 0.381 |

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

| Item                                  | 2020 | 2025  | 2030  | 2035 | 2040 | 2045 | 2050 |
|---------------------------------------|------|-------|-------|------|------|------|------|
| Sales of cooking units - Electric     | 41.9 | 46.2  | 50.2  | 60.8 | 75.4 | 84.6 | 87.8 |
| Resistance (%)                        |      |       |       |      |      |      |      |
| Sales of cooking units - Gas (%)      | 58.1 | 53.8  | 49.8  | 39.2 | 24.6 | 15.4 | 12.2 |
| Commercial HVAC investment in 2020s - |      | 7,532 | 8,365 |      |      |      |      |
| Cumulative 5-yr (million \$2018)      |      |       |       |      |      |      |      |

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

| Item                                 | 2020  | 2025  | 2030  | 2035  | 2040  | 2045  | 2050  |
|--------------------------------------|-------|-------|-------|-------|-------|-------|-------|
| Installed thermal - Coal (MW)        | 4,894 | 3,250 | 0     | 0     | 0     | 0     | 0     |
| Installed thermal - Natural gas (MW) | 2,926 | 2,930 | 3,451 | 3,446 | 3,032 | 2,376 | 3,645 |
| Installed thermal - Nuclear (MW)     | 0     | 0     | 0     | 0     | 0     | 0     | 0     |

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

| Item  | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050    |
|---|------|------|------|------|------|------|---------|
| Carbon sink potential - Low - Accelerate regeneration (1000 tC02e/y)        |      |      |      |      |      |      | -707    |
| Carbon sink potential - Low - Avoid deforestation (1000 tC02e/y)            |      |      |      |      |      |      | -140    |
| Carbon sink potential - Low - Extend rotation length (1000 tC02e/y)         |      |      |      |      |      |      | -2,919  |
| Carbon sink potential - Low - Improve plantations (1000 tC02e/y)            |      |      |      |      |      |      | -5.38   |
| Carbon sink potential - Low - Increase retention of HWP (1000 tC02e/y)      |      |      |      |      |      |      | -9.92   |
| Carbon sink potential - Low - Increase trees outside forests (1000 tC02e/y) |      |      |      |      |      |      | -116    |
| Carbon sink potential - Low - Reforest cropland (1000 tCO2e/y)              |      |      |      |      |      |      | -1,189  |
| Carbon sink potential - Low - Reforest pasture (1000 tC02e/y)               |      |      |      |      |      |      | -101    |
| Carbon sink potential - Low - Restore productivity (1000 tCO2e/y)           |      |      |      |      |      |      | -1,568  |
| Carbon sink potential - Low - All (not counting overlap) (1000 tC02e/y)     |      |      |      |      |      |      | -6,755  |
| Carbon sink potential - Mid - Accelerate regeneration (1000 tCO2e/y)        |      |      |      |      |      |      | -1,060  |
| Carbon sink potential - Mid - Avoid deforestation (1000 tCO2e/y)            |      |      |      |      |      |      | -489    |
| Carbon sink potential - Mid - Extend rotation length (1000 tCO2e/y)         |      |      |      |      |      |      | -5,260  |
| Carbon sink potential - Mid - Improve plantations (1000 tCO2e/y)            |      |      |      |      |      |      | -7.89   |
| Carbon sink potential - Mid - Increase retention of HWP (1000 tC02e/y)      |      |      |      |      |      |      | -19.8   |
| Carbon sink potential - Mid - Increase trees outside forests (1000 tC02e/y) |      |      |      |      |      |      | -224    |
| Carbon sink potential - Mid - Reforest                                      |      |      |      |      |      |      | -1,783  |
| cropland (1000 tC02e/y)  Carbon sink potential - Mid - Reforest             |      |      |      |      |      |      | -715    |
| pasture (1000 tC02e/y) Carbon sink potential - Mid - Restore                |      |      |      |      |      |      | -3,109  |
| productivity (1000 tCO2e/y) Carbon sink potential - Mid - All (not          |      |      |      |      |      |      | -12,667 |
| counting overlap) (1000 tCO2e/y) Carbon sink potential - High - Accelerate  |      |      |      |      |      |      | -1,412  |
| regeneration (1000 tCO2e/y)  Carbon sink potential - High - Avoid           |      |      |      |      |      |      | -838    |
| deforestation (1000 tCO2e/y)  |      |      |      |      |      |      |         |

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

| Item  | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050    |
|---|------|------|------|------|------|------|---------|
| Carbon sink potential - High - Extend   |      |      |      |      |      |      | -7,600  |
| rotation length (1000 tC02e/y)  |      |      |      |      |      |      | 10 (    |
| Carbon sink potential - High - Improve  |      |      |      |      |      |      | -10.6   |
| plantations (1000 tC02e/y)  |      |      |      |      |      |      | 00.0    |
| Carbon sink potential - High - Increase                                       |      |      |      |      |      |      | -29.8   |
| retention of HWP (1000 tC02e/y)   |      |      |      |      |      |      | 000     |
| Carbon sink potential - High - Increase                                       |      |      |      |      |      |      | -332    |
| trees outside forests (1000 tC02e/y)  Carbon sink potential - High - Reforest |      |      |      |      |      |      | -2,378  |
| cropland (1000 tCO2e/y)   |      |      |      |      |      |      | -2,310  |
| Carbon sink potential - High - Reforest                                       |      |      |      |      |      |      | -1,329  |
| pasture (1000 tCO2e/y)  |      |      |      |      |      |      | -1,327  |
| Carbon sink potential - High - All (not                                       |      |      |      |      |      |      | -18,580 |
| counting overlap) (1000 tC02e/y)  |      |      |      |      |      |      | -10,500 |
| Carbon sink potential - High - Restore  |      |      |      |      |      |      | -4,651  |
| productivity (1000 tCO2e/y)   |      |      |      |      |      |      | -4,001  |
| Land impacted for carbon sink potential -                                     |      |      |      |      |      |      | 116     |
| Low - Accelerate regeneration (1000   |      |      |      |      |      |      | 110     |
| hectares)   |      |      |      |      |      |      |         |
| Land impacted for carbon sink potential -                                     |      |      |      |      |      |      | 106     |
| Low - Avoid deforestation (over 30 years)                                     |      |      |      |      |      |      | 100     |
| (1000 hectares)   |      |      |      |      |      |      |         |
| Land impacted for carbon sink potential -                                     |      |      |      |      |      |      | 1,485   |
| Low - Extend rotation length (1000  |      |      |      |      |      |      | 1,400   |
| hectares)   |      |      |      |      |      |      |         |
| Land impacted for carbon sink potential -                                     |      |      |      |      |      |      | 1.95    |
| Low - Improve plantations (1000   |      |      |      |      |      |      |         |
| hectares)   |      |      |      |      |      |      |         |
| Land impacted for carbon sink potential -                                     |      |      |      |      |      |      | 0       |
| Low - Increase retention of HWP (1000   |      |      |      |      |      |      |         |
| hectares)   |      |      |      |      |      |      |         |
| Land impacted for carbon sink potential -                                     |      |      |      |      |      |      | 16.6    |
| Low - Increase trees outside forests  |      |      |      |      |      |      |         |
| (1000 hectares)   |      |      |      |      |      |      |         |
| Land impacted for carbon sink potential -                                     |      |      |      |      |      |      | 78.6    |
| Low - Reforest cropland (1000 hectares)                                       |      |      |      |      |      |      |         |
| Land impacted for carbon sink potential -                                     |      |      |      |      |      |      | 6.55    |
| Low - Reforest pasture (1000 hectares)  |      |      |      |      |      |      |         |
| Land impacted for carbon sink potential -                                     |      |      |      |      |      |      | 933     |
| Low - Restore productivity (1000  |      |      |      |      |      |      |         |
| hectares)   |      |      |      |      |      |      |         |
| Land impacted for carbon sink potential -                                     |      |      |      |      |      |      | 2,743   |
| Low - Total impacted (over 30 years)  |      |      |      |      |      |      |         |
| (1000 hectares)   |      |      |      |      |      |      |         |
| Land impacted for carbon sink potential -                                     |      |      |      |      |      |      | 173     |
| Mid - Accelerate regeneration (1000   |      |      |      |      |      |      |         |
| hectares)   |      |      |      |      |      |      |         |
| Land impacted for carbon sink potential -                                     |      |      |      |      |      |      | 110     |
| Mid - Avoid deforestation (over 30 years)                                     |      |      |      |      |      |      |         |
| (1000 hectares)   |      |      |      |      |      |      | 0.400   |
| Land impacted for carbon sink potential -                                     |      |      |      |      |      |      | 2,680   |
| Mid - Extend rotation length (1000  |      |      |      |      |      |      |         |
| hectares)   |      |      |      |      |      |      | 0.00    |
| Land impacted for carbon sink potential -                                     |      |      |      |      |      |      | 2.93    |
| Mid - Improve plantations (1000 hectares)                                     |      |      |      |      |      |      |         |
| Land impacted for carbon sink potential -                                     |      |      |      |      |      |      | 0       |
| Mid - Increase retention of HWP (1000   |      |      |      |      |      |      |         |
| hectares)   |      |      |      |      |      |      | 07.5    |
| Land impacted for carbon sink potential -                                     |      |      |      |      |      |      | 24.1    |
| Mid - Increase trees outside forests (1000                                    |      |      |      |      | 1    |      |         |

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

| Item                                       | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050  |
|--|------|------|------|------|------|------|-------|
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 118   |
| Mid - Reforest cropland (1000 hectares)    |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 47.3  |
| Mid - Reforest pasture (1000 hectares)     |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 1,879 |
| Mid - Restore productivity (1000           |      |      |      |      |      |      |       |
| hectares)                                  |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 5,034 |
| Mid - Total impacted (over 30 years) (1000 |      |      |      |      |      |      |       |
| hectares)                                  |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 231   |
| High - Accelerate regeneration (1000       |      |      |      |      |      |      |       |
| hectares)                                  |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 113   |
| High - Avoid deforestation (over 30 years) |      |      |      |      |      |      |       |
| (1000 hectares)                            |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 3,876 |
| High - Extend rotation length (1000        |      |      |      |      |      |      | -,-   |
| hectares                                   |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 3.9   |
| High - Improve plantations (1000           |      |      |      |      |      |      |       |
| hectares)                                  |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 0     |
| High - Increase retention of HWP (1000     |      |      |      |      |      |      | _     |
| hectares)                                  |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 31.5  |
| High - Increase trees outside forests      |      |      |      |      |      |      |       |
| (1000 hectares)                            |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 157   |
| High - Reforest cropland (1000 hectares)   |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 37.8  |
| High - Reforest pasture (1000 hectares)    |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 1,542 |
| High - Restore productivity (1000          |      |      |      |      |      |      | .,    |
| hectares)                                  |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 5,992 |
| High - Total impacted (over 30 years)      |      |      |      |      |      |      | 3,772 |
| (1000 hectares)                            |      |      |      |      |      |      |       |
| (1000 Hootal co)                           |      |      |      |      |      |      |       |

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

| Item                                 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050  |
|--------------------------------------|------|------|------|------|------|------|-------|
| Carbon sink potential - Moderate     |      |      |      |      |      |      | 0     |
| deployment - Corn-ethanol to energy  |      |      |      |      |      |      |       |
| grasses (1000 tCO2e/y)               |      |      |      |      |      |      |       |
| Carbon sink potential - Moderate     |      |      |      |      |      |      | -184  |
| deployment - Cropland measures (1000 |      |      |      |      |      |      |       |
| tCO2e/y)                             |      |      |      |      |      |      |       |
| Carbon sink potential - Moderate     |      |      |      |      |      |      | -7.84 |
| deployment - Permanent conservation  |      |      |      |      |      |      |       |
| cover (1000 tCO2e/y)                 |      |      |      |      |      |      |       |
| Carbon sink potential - Moderate     |      |      |      |      |      |      | -192  |
| deployment - Total (1000 tCO2e/y)    |      |      |      |      |      |      |       |
| Carbon sink potential - Aggressive   |      |      |      |      |      |      | 0     |
| deployment - Corn-ethanol to energy  |      |      |      |      |      |      |       |
| grasses (1000 tCO2e/y)               |      |      |      |      |      |      |       |
| Carbon sink potential - Aggressive   |      |      |      |      |      |      | -360  |
| deployment - Cropland measures (1000 |      |      |      |      |      |      |       |
| tCO2e/y)                             |      |      |      |      |      |      |       |

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

| Item                                     | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050  |
|--|------|------|------|------|------|------|-------|
| Carbon sink potential - Aggressive       |      |      |      |      |      |      | -15.7 |
| deployment - Permanent conservation      |      |      |      |      |      |      |       |
| cover (1000 tCO2e/y)                     |      |      |      |      |      |      |       |
| Carbon sink potential - Aggressive       |      |      |      |      |      |      | -376  |
| deployment - Total (1000 tCO2e/y)        |      |      |      |      |      |      |       |
| Land impacted for carbon sink - Moderate |      |      |      |      |      |      | 0     |
| deployment - Corn-ethanol to energy      |      |      |      |      |      |      |       |
| grasses (1000 hectares)                  |      |      |      |      |      |      |       |
| Land impacted for carbon sink - Moderate |      |      |      |      |      |      | 329   |
| deployment - Cropland measures (1000     |      |      |      |      |      |      |       |
| hectares)                                |      |      |      |      |      |      |       |
| Land impacted for carbon sink - Moderate |      |      |      |      |      |      | 12.1  |
| deployment - Permanent conservation      |      |      |      |      |      |      |       |
| cover (1000 hectares)                    |      |      |      |      |      |      |       |
| Land impacted for carbon sink - Moderate |      |      |      |      |      |      | 341   |
| deployment - Total (1000 hectares)       |      |      |      |      |      |      |       |
| Land impacted for carbon sink -          |      |      |      |      |      |      | 0     |
| Aggressive deployment - Corn-ethanol to  |      |      |      |      |      |      |       |
| energy grasses (1000 hectares)           |      |      |      |      |      |      |       |
| Land impacted for carbon sink -          |      |      |      |      |      |      | 646   |
| Aggressive deployment - Cropland         |      |      |      |      |      |      |       |
| measures (1000 hectares)                 |      |      |      |      |      |      |       |
| Land impacted for carbon sink -          |      |      |      |      |      |      | 24.1  |
| Aggressive deployment - Permanent        |      |      |      |      |      |      |       |
| conservation cover (1000 hectares)       |      |      |      |      |      |      |       |
| Land impacted for carbon sink -          |      |      |      |      |      |      | 670   |
| Aggressive deployment - Total (1000      |      |      |      |      |      |      |       |
| hectares)                                |      |      |      |      |      |      |       |

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

| Item   | 2020 | 2025  | 2030  | 2035  | 2040  | 2045  | 2050  |
|--|------|-------|-------|-------|-------|-------|-------|
| Premature deaths from air pollution -<br>Fuel Comb - Electric Generation - Coal<br>(deaths)        |      | 17.8  | 0.021 | 0.021 | 0.018 | 0.012 | 0     |
| Premature deaths from air pollution -<br>Fuel Comb - Electric Generation - Natural<br>Gas (deaths) |      | 4.2   | 2.57  | 1.46  | 1.08  | 0.496 | 0.392 |
| Premature deaths from air pollution -<br>Mobile - On-Road (deaths)                                 |      | 83.8  | 81.5  | 64.3  | 38.3  | 18    | 7.23  |
| Premature deaths from air pollution - Gas<br>Stations (deaths)                                     |      | 3.94  | 3.78  | 3     | 1.9   | 1.04  | 0.599 |
| Premature deaths from air pollution -<br>Fuel Comb - Residential - Natural Gas<br>(deaths)         |      | 16.6  | 15.9  | 12.3  | 7.43  | 3.73  | 1.49  |
| Premature deaths from air pollution -<br>Fuel Comb - Residential - Oil (deaths)                    |      | 0.075 | 0.068 | 0.054 | 0.039 | 0.028 | 0.019 |
| Premature deaths from air pollution -<br>Fuel Comb - Residential - Other (deaths)                  |      | 0.626 | 0.623 | 0.533 | 0.39  | 0.241 | 0.134 |
| Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Coal (deaths)               |      | 0.053 | 0.053 | 0.052 | 0.051 | 0.05  | 0.048 |
| Premature deaths from air pollution -<br>Fuel Comb - Comm/Institutional - Natural<br>Gas (deaths)  |      | 5.19  | 4.84  | 3.82  | 2.47  | 1.34  | 0.6   |
| Premature deaths from air pollution -<br>Fuel Comb - Comm/Institutional - Oil<br>(deaths)          |      | 0.423 | 0.351 | 0.286 | 0.224 | 0.165 | 0.11  |
| Premature deaths from air pollution -<br>Fuel Comb - Comm/Institutional - Other<br>(deaths)        |      | 0.842 | 0.734 | 0.62  | 0.499 | 0.376 | 0.253 |

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

| Item   | 2020 | 2025  | 2030  | 2035  | 2040  | 2045  | 2050  |
|--|------|-------|-------|-------|-------|-------|-------|
| Premature deaths from air pollution -<br>Industrial Processes - Coal Mining<br>(deaths)                    |      | 0.216 | 0.025 | 0.024 | 0.022 | 0.021 | 0.007 |
| Premature deaths from air pollution -<br>Industrial Processes - Oil & Gas<br>Production (deaths)           |      | 21    | 20.4  | 18    | 13.3  | 8.3   | 1.25  |
| Monetary damages from air pollution -<br>Fuel Comb - Electric Generation - Coal<br>(million \$2019)        |      | 158   | 0.183 | 0.183 | 0.163 | 0.107 | 0     |
| Monetary damages from air pollution -<br>Fuel Comb - Electric Generation - Natural<br>Gas (million \$2019) |      | 37.2  | 22.7  | 13    | 9.6   | 4.4   | 3.47  |
| Monetary damages from air pollution -<br>Mobile - On-Road (million \$2019)                                 |      | 745   | 724   | 572   | 341   | 160   | 64.3  |
| Monetary damages from air pollution -<br>Gas Stations (million \$2019)                                     |      | 34.9  | 33.5  | 26.6  | 16.8  | 9.17  | 5.31  |
| Monetary damages from air pollution -<br>Fuel Comb - Residential - Natural Gas<br>(million \$2019)         |      | 147   | 141   | 109   | 65.8  | 33.1  | 13.2  |
| Monetary damages from air pollution -<br>Fuel Comb - Residential - Oil (million<br>\$2019)                 |      | 0.668 | 0.6   | 0.479 | 0.347 | 0.244 | 0.165 |
| Monetary damages from air pollution -<br>Fuel Comb - Residential - Other (million<br>\$2019)               |      | 5.55  | 5.52  | 4.73  | 3.46  | 2.13  | 1.19  |
| Monetary damages from air pollution -<br>Fuel Comb - Comm/Institutional - Coal<br>(million \$2019)         |      | 0.473 | 0.47  | 0.463 | 0.453 | 0.439 | 0.422 |
| Monetary damages from air pollution -<br>Fuel Comb - Comm/Institutional - Natural<br>Gas (million \$2019)  |      | 46    | 42.9  | 33.8  | 21.9  | 11.9  | 5.31  |
| Monetary damages from air pollution -<br>Fuel Comb - Comm/Institutional - Oil<br>(million \$2019)          |      | 3.75  | 3.11  | 2.54  | 1.98  | 1.46  | 0.971 |
| Monetary damages from air pollution -<br>Fuel Comb - Comm/Institutional - Other<br>(million \$2019)        |      | 7.46  | 6.49  | 5.48  | 4.42  | 3.33  | 2.24  |
| Monetary damages from air pollution -<br>Industrial Processes - Coal Mining<br>(million \$2019)            |      | 1.9   | 0.225 | 0.212 | 0.191 | 0.181 | 0.063 |
| Monetary damages from air pollution -<br>Industrial Processes - Oil & Gas<br>Production (million \$2019)   |      | 187   | 181   | 160   | 118   | 73.7  | 11.1  |

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

| Item                                     | 2020 | 2025  | 2030  | 2035   | 2040   | 2045   | 2050   |
|--|------|-------|-------|--------|--------|--------|--------|
| By economic sector - Agriculture (jobs)  |      | 4.23  | 8.78  | 8.83   | 6.88   | 5.07   | 17.1   |
| By economic sector - Construction (jobs) |      | 4,929 | 5,915 | 6,605  | 6,774  | 6,759  | 14,336 |
| By economic sector - Manufacturing       |      | 4,238 | 5,146 | 6,118  | 5,949  | 5,218  | 8,750  |
| (jobs)                                   |      |       |       |        |        |        |        |
| By economic sector - Mining (jobs)       |      | 4,959 | 3,408 | 2,454  | 1,521  | 857    | 256    |
| By economic sector - Other (jobs)        |      | 485   | 587   | 715    | 829    | 948    | 2,836  |
| By economic sector - Pipeline (jobs)     |      | 393   | 346   | 272    | 186    | 110    | 30.2   |
| By economic sector - Professional (jobs) |      | 2,861 | 3,163 | 3,436  | 3,670  | 3,948  | 7,682  |
| By economic sector - Trade (jobs)        |      | 2,883 | 2,595 | 2,601  | 2,522  | 2,538  | 5,007  |
| By economic sector - Utilities (jobs)    |      | 4,231 | 5,617 | 6,228  | 6,355  | 6,153  | 11,893 |
| By resource sector - Biomass (jobs)      |      | 16.5  | 24.8  | 23.8   | 22.5   | 18.8   | 75.5   |
| By resource sector - CO2 (jobs)          |      | 0     | 0     | 0      | 0      | 0      | 0      |
| By resource sector - Coal (jobs)         |      | 3,022 | 1,182 | 528    | 459    | 414    | 351    |
| By resource sector - Grid (jobs)         |      | 5,281 | 8,968 | 11,313 | 11,693 | 11,230 | 23,448 |

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

| 14510 2012 112 000114110 11 11 11010 000                    | o (oomemaa | · ~ j  |        |         |        |        |        |
|---|------------|--------|--------|---------|--------|--------|--------|
| Item  | 2020       | 2025   | 2030   | 2035    | 2040   | 2045   | 2050   |
| By resource sector - Natural Gas (jobs)                     |            | 4,700  | 3,973  | 2,796   | 2,051  | 1,495  | 742    |
| By resource sector - Nuclear (jobs)                         |            | 0      | 0      | 0       | 0      | 0      | 0      |
| By resource sector - Oil (jobs)                             |            | 6,802  | 5,905  | 4,898   | 3,260  | 1,961  | 335    |
| By resource sector - Solar (jobs)                           |            | 3,646  | 3,710  | 4,241   | 4,813  | 5,245  | 15,801 |
| By resource sector - Wind (jobs)                            |            | 1,515  | 3,023  | 4,637   | 5,515  | 6,175  | 10,056 |
| By education level - All sectors - High                     |            | 10,491 | 11,223 | 12,019  | 11,742 | 11,123 | 21,462 |
| school diploma or less (jobs)                               |            |        |        |         |        |        |        |
| By education level - All sectors -                          |            | 7,558  | 8,299  | 8,913   | 8,827  | 8,501  | 16,510 |
| Associates degree or some college (jobs)                    |            |        |        |         |        |        |        |
| By education level - All sectors -                          |            | 5,460  | 5,717  | 5,912   | 5,690  | 5,402  | 9,999  |
| Bachelors degree (jobs)                                     |            |        |        |         |        |        |        |
| By education level - All sectors - Masters                  |            | 1,292  | 1,360  | 1,403   | 1,366  | 1,323  | 2,482  |
| or professional degree (jobs)                               |            |        |        |         |        |        |        |
| By education level - All sectors - Doctoral                 |            | 181    | 187    | 191     | 189    | 189    | 357    |
| degree (jobs)   |            | 0.510  | 0.011  | / 050   | 0.000  | 0.005  | 70//   |
| Related work experience - All sectors -                     |            | 3,510  | 3,811  | 4,059   | 3,982  | 3,805  | 7,366  |
| None (jobs)   |            | 4.004  | F 0/1  | F / / 1 | E EE1  | F 000  | 10.000 |
| Related work experience - All sectors - Up                  |            | 4,904  | 5,241  | 5,641   | 5,551  | 5,308  | 10,339 |
| to 1 year (jobs)  Related work experience - All sectors - 1 |            | 9,193  | 9,770  | 10,310  | 10,042 | 9,561  | 18,176 |
| to 4 years (jobs)   |            | 9,193  | 9,770  | 10,310  | 10,042 | 9,561  | 18,176 |
| Related work experience - All sectors - 4                   |            | 5,793  | 6,256  | 6,619   | 6,480  | 6,200  | 11,802 |
| to 10 years (jobs)  |            | 5,195  | 6,256  | 0,019   | 0,400  | 6,200  | 11,002 |
| Related work experience - All sectors -                     |            | 1,583  | 1,708  | 1,809   | 1,759  | 1,665  | 3,126  |
| Over 10 years (jobs)  |            | 1,505  | 1,100  | 1,007   | 1,107  | 1,000  | 0,120  |
| On-the-Job Training - All sectors - None                    |            | 1,366  | 1,438  | 1,510   | 1,471  | 1,408  | 2,734  |
| (jobs)  |            | 1,000  | 1,400  | 1,010   | 1,-11  | 1,400  | 2,104  |
| On-the-Job Training - All sectors - Up to 1                 |            | 16,780 | 17,832 | 18,908  | 18,419 | 17,494 | 33,254 |
| year (jobs)   |            | .5,.55 | ,552   | .57.55  | ,      | ,      | 00,20  |
| On-the-Job Training - All sectors - 1 to 4                  |            | 5,099  | 5,580  | 5,951   | 5,861  | 5,623  | 10,849 |
| years (jobs)  |            | -,-    | -,     |         | ,      | -,     | -,-    |
| On-the-Job Training - All sectors - 4 to 10                 |            | 1,500  | 1,678  | 1,792   | 1,793  | 1,756  | 3,480  |
| years (jobs)  |            |        |        |         |        |        |        |
| On-the-Job Training - All sectors - Over 10                 |            | 237    | 258    | 277     | 271    | 257    | 492    |
| years (jobs)  |            |        |        |         |        |        |        |
| On-Site or In-Plant Training - All sectors -                |            | 3,969  | 4,273  | 4,541   | 4,461  | 4,285  | 8,257  |
| None (jobs)   |            |        |        |         |        |        |        |
| On-Site or In-Plant Training - All sectors -                |            | 15,243 | 16,190 | 17,164  | 16,717 | 15,875 | 30,210 |
| Up to 1 year (jobs)   |            |        |        |         |        |        |        |
| On-Site or In-Plant Training - All sectors -                |            | 3,995  | 4,352  | 4,642   | 4,561  | 4,363  | 8,408  |
| 1 to 4 years (jobs)   |            |        |        |         |        |        |        |
| On-Site or In-Plant Training - All sectors -                |            | 1,583  | 1,749  | 1,852   | 1,835  | 1,782  | 3,480  |
| 4 to 10 years (jobs)  |            |        |        |         |        |        |        |
| On-Site or In-Plant Training - All sectors -                |            | 193    | 221    | 240     | 240    | 233    | 454    |
| Over 10 years (jobs)  |            |        |        |         |        |        |        |
| Wage income - All (million \$2019)                          |            | 1,348  | 1,452  | 1,540   | 1,512  | 1,453  | 2,774  |

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

| Item                                   | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|------|------|------|------|------|------|------|
| Final energy use - Transportation (PJ) | 304  | 290  | 260  | 223  | 188  | 168  | 161  |
| Final energy use - Residential (PJ)    | 126  | 122  | 118  | 106  | 90.4 | 79.2 | 72.3 |
| Final energy use - Commercial (PJ)     | 103  | 103  | 101  | 94.8 | 87.6 | 82.5 | 80.3 |
| Final energy use - Industry (PJ)       | 86.5 | 89.3 | 90.2 | 96.9 | 111  | 116  | 122  |

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

| Item  | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|------|------|------|------|------|------|------|
| Electricity distribution capital invested - |      | 1.72 | 1.81 | 3.2  | 3.44 | 3.67 | 3.91 |
| Cumulative 5-yr (billion \$2018)            |      |      |      |      |      |      |      |

| Table 31: <i>E+RE+ scenario -</i> | PILLAR 1: Efficiency | /Electrification - | Transportation |
|-----------------------------------|----------------------|--------------------|----------------|
|-----------------------------------|----------------------|--------------------|----------------|

| Item                                       | 2020  | 2025  | 2030  | 2035  | 2040  | 2045  | 2050  |
|--|-------|-------|-------|-------|-------|-------|-------|
| Vehicle stocks - LDV – EV (1000 units)     | 48.6  | 240   | 431   | 1,101 | 1,770 | 2,306 | 2,841 |
| Vehicle stocks - LDV – All others (1000    | 2,369 | 2,255 | 2,142 | 1,561 | 980   | 554   | 129   |
| units)                                     |       |       |       |       |       |       |       |
| Light-duty vehicle capital costs vs. REF - |       | 449   | 1,171 | 1,866 | 2,839 | 3,076 | 2,940 |
| Cumulative 5-yr (million \$2018)           |       |       |       |       |       |       |       |
| Public EV charging plugs - DC Fast (1000   | 0.174 |       | 0.748 |       | 3.07  |       | 4.93  |
| units)                                     |       |       |       |       |       |       |       |
| Public EV charging plugs - L2 (1000 units) | 1.07  |       | 18    |       | 73.9  |       | 119   |

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

| Item                                       | 2020  | 2025 | 2030 | 2035  | 2040  | 2045  | 2050  |
|--|-------|------|------|-------|-------|-------|-------|
| Sales of space heating units - Electric    | 3.03  | 9.9  | 34.8 | 79.5  | 87.6  | 88.4  | 88.2  |
| Heat Pump (%)                              |       |      |      |       |       |       |       |
| Sales of space heating units - Electric    | 3.81  | 7.35 | 5.69 | 2.51  | 1.97  | 1.95  | 1.97  |
| Resistance (%)                             |       |      |      |       |       |       |       |
| Sales of space heating units - Gas (%)     | 89.6  | 73.5 | 50.6 | 9.98  | 2.86  | 2.43  | 2.43  |
| Sales of space heating units - Fossil (%)  | 3.57  | 9.24 | 8.91 | 8.06  | 7.57  | 7.25  | 7.38  |
| Sales of water heating units - Electric    | 0     | 1.51 | 15.7 | 41.6  | 46.2  | 46.5  | 46.5  |
| Heat Pump (%)                              |       |      |      |       |       |       |       |
| Sales of water heating units - Electric    | 7.01  | 15.7 | 26.3 | 48.5  | 52.5  | 52.7  | 52.7  |
| Resistance (%)                             |       |      |      |       |       |       |       |
| Sales of water heating units - Gas Furnace | 92.3  | 82   | 57.3 | 9.09  | 0.535 | 0     | 0     |
| (%)  |       |      |      |       |       |       |       |
| Sales of water heating units - Other (%)   | 0.642 | 0.79 | 0.79 | 0.787 | 0.779 | 0.778 | 0.778 |
| Sales of cooking units - Electric          | 37.1  | 50.5 | 91.5 | 99.6  | 100   | 100   | 100   |
| Resistance (%)                             |       |      |      |       |       |       |       |
| Sales of cooking units - Gas (%)           | 62.9  | 49.5 | 8.47 | 0.426 | 0     | 0     | 0     |
| Residential HVAC investment in 2020s vs.   |       | 2.76 | 3.21 |       |       |       |       |
| REF - Cumulative 5-yr (billion \$2018)     |       |      |      |       |       |       |       |

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

| Item                                      | 2020  | 2025  | 2030  | 2035  | 2040  | 2045  | 2050  |
|---|-------|-------|-------|-------|-------|-------|-------|
| Sales of space heating units - Electric   | 0.749 | 8.98  | 33.5  | 81.9  | 90.4  | 91    | 91    |
| Heat Pump (%)                             |       |       |       |       |       |       |       |
| Sales of space heating units - Electric   | 0.855 | 3.41  | 4.83  | 7.94  | 8.5   | 8.54  | 8.55  |
| Resistance (%)                            |       |       |       |       |       |       |       |
| Sales of space heating units - Gas (%)    | 98.4  | 87.4  | 61.6  | 10.2  | 1.06  | 0.491 | 0.49  |
| Sales of space heating units - Fossil (%) | 0     | 0.208 | 0.04  | 0.002 | 0     | 0     | 0     |
| Sales of water heating units - Electric   | 0.008 | 1.61  | 16.7  | 45    | 50    | 50.3  | 50.3  |
| Heat Pump (%)                             |       |       |       |       |       |       |       |
| Sales of water heating units - Electric   | 0.41  | 2.69  | 16.3  | 44.1  | 49    | 49.3  | 49.3  |
| Resistance (%)                            |       |       |       |       |       |       |       |
| Sales of water heating units - Gas (%)    | 99.5  | 95.3  | 66.6  | 10.6  | 0.622 | 0     | 0     |
| Sales of water heating units - Other (%)  | 0.1   | 0.381 | 0.381 | 0.382 | 0.381 | 0.381 | 0.381 |
| Sales of cooking units - Electric         | 41.9  | 54.6  | 83    | 88.6  | 88.9  | 88.9  | 88.9  |
| Resistance (%)                            |       |       |       |       |       |       |       |
| Sales of cooking units - Gas (%)          | 58.1  | 45.4  | 17    | 11.4  | 11.1  | 11.1  | 11.1  |
| Commercial HVAC investment in 2020s -     |       | 7,533 | 8,381 |       |       |       |       |
| Cumulative 5-yr (million \$2018)          |       |       |       |       |       |       |       |

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

| Item                                 | 2020  | 2025  | 2030  | 2035  | 2040  | 2045  | 2050  |
|--------------------------------------|-------|-------|-------|-------|-------|-------|-------|
| Installed thermal - Coal (MW)        | 4,894 | 4,316 | 0     | 0     | 0     | 0     | 0     |
| Installed thermal - Natural gas (MW) | 2,926 | 2,940 | 3,700 | 3,726 | 3,038 | 2,564 | 3,833 |

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

| Item  | 2020  | 2025  | 2030  | 2035   | 2040   | 2045   | 2050   |
|---|-------|-------|-------|--------|--------|--------|--------|
| Installed thermal - Nuclear (MW)            | 0     | 0     | 0     | 0      | 0      | 0      | 0      |
| Installed renewables - Rooftop PV (MW)      | 540   | 833   | 1,113 | 1,450  | 1,851  | 2,318  | 2,871  |
| Installed renewables - Solar - Base land    | 768   | 768   | 768   | 768    | 768    | 768    | 8,483  |
| use assumptions (MW)                        |       |       |       |        |        |        |        |
| Installed renewables - Wind - Base land     | 547   | 1,001 | 7,535 | 12,685 | 16,824 | 19,028 | 22,089 |
| use assumptions (MW)                        |       |       |       |        |        |        |        |
| Installed renewables - Solar -              | 769   | 769   | 769   | 5,567  | 7,586  | 9,769  | 17,297 |
| Constrained land use assumptions (MW)       |       |       |       |        |        |        |        |
| Installed renewables - Wind - Constrained   | 1,291 | 2,730 | 9,634 | 13,133 | 15,301 | 16,157 | 18,496 |
| land use assumptions (MW)                   |       |       |       |        |        |        |        |
| Installed renewables - Offshore Wind -      | 0     | 0     | 0     | 0      | 0      | 0      | 0      |
| Constrained land use assumptions (MW)       |       |       |       |        |        |        |        |
| Capital invested - Solar PV - Base (billion |       | 0     | 0     | 0      | 0      | 0      | 7.15   |
| \$2018)                                     |       |       |       |        |        |        |        |
| Capital invested - Wind - Base (billion     |       | 0.668 | 8.7   | 6.39   | 4.89   | 2.47   | 3.24   |
| \$2018)                                     |       |       |       |        |        |        |        |

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

| Item  | 2020  | 2025   | 2030   | 2035   | 2040   | 2045   | 2050   |
|---|-------|--------|--------|--------|--------|--------|--------|
| Solar - Base land use assumptions (GWh)               | 2,042 | 2,042  | 2,042  | 2,042  | 2,042  | 2,042  | 18,184 |
| Wind - Base land use assumptions (GWh)                | 1,617 | 2,948  | 21,310 | 35,224 | 46,069 | 51,530 | 59,186 |
| OffshoreWind - Base land use assumptions (GWh)        | 0     | 0      | 0      | 0      | 0      | 0      | 0      |
| Solar - Constrained land use assumptions (GWh)        | 4,085 | 4,085  | 4,085  | 25,752 | 34,830 | 44,503 | 76,079 |
| Wind - Constrained land use assumptions (GWh)         | 7,126 | 15,214 | 49,826 | 65,862 | 75,327 | 78,528 | 87,375 |
| OffshoreWind - Constrained land use assumptions (GWh) | 0     | 0      | 0      | 0      | 0      | 0      | 0      |

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

| Item                                     | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050   |
|--|------|------|------|------|------|------|--------|
| Carbon sink potential - Low - Accelerate |      |      |      |      |      |      | -707   |
| regeneration (1000 tCO2e/y)              |      |      |      |      |      |      |        |
| Carbon sink potential - Low - Avoid      |      |      |      |      |      |      | -140   |
| deforestation (1000 tCO2e/y)             |      |      |      |      |      |      |        |
| Carbon sink potential - Low - Extend     |      |      |      |      |      |      | -2,919 |
| rotation length (1000 tCO2e/y)           |      |      |      |      |      |      |        |
| Carbon sink potential - Low - Improve    |      |      |      |      |      |      | -5.38  |
| plantations (1000 tCO2e/y)               |      |      |      |      |      |      |        |
| Carbon sink potential - Low - Increase   |      |      |      |      |      |      | -9.92  |
| retention of HWP (1000 tCO2e/y)          |      |      |      |      |      |      |        |
| Carbon sink potential - Low - Increase   |      |      |      |      |      |      | -116   |
| trees outside forests (1000 tCO2e/y)     |      |      |      |      |      |      |        |
| Carbon sink potential - Low - Reforest   |      |      |      |      |      |      | -1,189 |
| cropland (1000 tCO2e/y)                  |      |      |      |      |      |      |        |
| Carbon sink potential - Low - Reforest   |      |      |      |      |      |      | -101   |
| pasture (1000 tCO2e/y)                   |      |      |      |      |      |      |        |
| Carbon sink potential - Low - Restore    |      |      |      |      |      |      | -1,568 |
| productivity (1000 tCO2e/y)              |      |      |      |      |      |      |        |
| Carbon sink potential - Low - All (not   |      |      |      |      |      |      | -6,755 |
| counting overlap) (1000 tCO2e/y)         |      |      |      |      |      |      |        |
| Carbon sink potential - Mid - Accelerate |      |      |      |      |      |      | -1,060 |
| regeneration (1000 tCO2e/y)              |      |      |      |      |      |      |        |
| Carbon sink potential - Mid - Avoid      |      |      |      |      |      |      | -489   |
| deforestation (1000 tCO2e/y)             |      |      |      |      |      |      |        |
| Carbon sink potential - Mid - Extend     |      |      |      |      |      |      | -5,260 |
| rotation length (1000 tCO2e/y)           |      |      |      |      |      |      |        |

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

| Item Conhon sink potential Mid Improve                           | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050    |
|--|------|------|------|------|------|------|---------|
| Carbon sink potential - Mid - Improve plantations (1000 tCO2e/y) |      |      |      |      |      |      | -7.89   |
| Carbon sink potential - Mid - Increase                           |      |      |      |      |      |      | -19.8   |
| retention of HWP (1000 tCO2e/y)                                  |      |      |      |      |      |      | -17.0   |
| Carbon sink potential - Mid - Increase                           |      |      |      |      |      |      | -224    |
| trees outside forests (1000 tC02e/y)                             |      |      |      |      |      |      | -224    |
| Carbon sink potential - Mid - Reforest                           |      |      |      |      |      |      | -1,783  |
| cropland (1000 tCO2e/y)  |      |      |      |      |      |      | -1,100  |
| Carbon sink potential - Mid - Reforest                           |      |      |      |      |      |      | -715    |
| pasture (1000 tC02e/y)   |      |      |      |      |      |      | 110     |
| Carbon sink potential - Mid - Restore                            |      |      |      |      |      |      | -3,109  |
| productivity (1000 tC02e/y)                                      |      |      |      |      |      |      | 0,107   |
| Carbon sink potential - Mid - All (not                           |      |      |      |      |      |      | -12,667 |
| counting overlap) (1000 tCO2e/y)                                 |      |      |      |      |      |      | ,       |
| Carbon sink potential - High - Accelerate                        |      |      |      |      |      |      | -1,412  |
| regeneration (1000 tCO2e/y)                                      |      |      |      |      |      |      | .,      |
| Carbon sink potential - High - Avoid                             |      |      |      |      |      |      | -838    |
| deforestation (1000 tC02e/y)                                     |      |      |      |      |      |      |         |
| Carbon sink potential - High - Extend                            |      |      |      |      |      |      | -7,600  |
| rotation length (1000 tC02e/y)                                   |      |      |      |      |      |      | .,000   |
| Carbon sink potential - High - Improve                           |      |      |      |      |      |      | -10.6   |
| plantations (1000 tCO2e/y)                                       |      |      |      |      |      |      | .0.0    |
| Carbon sink potential - High - Increase                          |      |      |      |      |      |      | -29.8   |
| retention of HWP (1000 tCO2e/y)                                  |      |      |      |      |      |      | 27.0    |
| Carbon sink potential - High - Increase                          |      |      |      |      |      |      | -332    |
| trees outside forests (1000 tC02e/y)                             |      |      |      |      |      |      | 002     |
| Carbon sink potential - High - Reforest                          |      |      |      |      |      |      | -2,378  |
| cropland (1000 tCO2e/y)  |      |      |      |      |      |      | _,0.0   |
| Carbon sink potential - High - Reforest                          |      |      |      |      |      |      | -1,329  |
| pasture (1000 tC02e/y)   |      |      |      |      |      |      | .,      |
| Carbon sink potential - High - All (not                          |      |      |      |      |      |      | -18,580 |
| counting overlap) (1000 tCO2e/y)                                 |      |      |      |      |      |      | ,       |
| Carbon sink potential - High - Restore                           |      |      |      |      |      |      | -4,651  |
| productivity (1000 tCO2e/y)                                      |      |      |      |      |      |      | ,       |
| Land impacted for carbon sink potential -                        |      |      |      |      |      |      | 116     |
| Low - Accelerate regeneration (1000                              |      |      |      |      |      |      |         |
| hectares)  |      |      |      |      |      |      |         |
| Land impacted for carbon sink potential -                        |      |      |      |      |      |      | 106     |
| Low - Avoid deforestation (over 30 years)                        |      |      |      |      |      |      |         |
| (1000 hectares)  |      |      |      |      |      |      |         |
| Land impacted for carbon sink potential -                        |      |      |      |      |      |      | 1,485   |
| Low - Extend rotation length (1000                               |      |      |      |      |      |      |         |
| hectares)  |      |      |      |      |      |      |         |
| Land impacted for carbon sink potential -                        |      |      |      |      |      |      | 1.95    |
| Low - Improve plantations (1000                                  |      |      |      |      |      |      |         |
| hectares)  |      |      |      |      |      |      |         |
| Land impacted for carbon sink potential -                        |      |      |      |      |      |      | 0       |
| Low - Increase retention of HWP (1000                            |      |      |      |      |      |      |         |
| hectares)  |      |      |      |      |      |      |         |
| Land impacted for carbon sink potential -                        |      |      |      |      |      |      | 16.6    |
| Low - Increase trees outside forests                             |      |      |      |      |      |      |         |
| (1000 hectares)  |      |      |      |      |      |      |         |
| Land impacted for carbon sink potential -                        |      |      |      |      |      |      | 78.6    |
| Low - Reforest cropland (1000 hectares)                          |      |      |      |      |      |      |         |
| Land impacted for carbon sink potential -                        |      |      |      |      |      |      | 6.55    |
| Low - Reforest pasture (1000 hectares)                           |      |      |      |      |      |      |         |
| Land impacted for carbon sink potential -                        |      |      |      |      |      |      | 933     |
| Low - Restore productivity (1000                                 |      |      |      |      |      |      |         |
| hectares)  |      |      |      |      |      |      |         |

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

| Table 36: E+RE+ scenario - PILLAR 6: Land Item      | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050  |
|---|------|------|------|------|------|------|-------|
| Land impacted for carbon sink potential -           | 2020 | 2020 | 2000 | 2000 | 2040 | 2040 | 2,743 |
| Low - Total impacted (over 30 years)                |      |      |      |      |      |      | 2,140 |
| (1000 hectares)                                     |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -           |      |      |      |      |      | +    | 173   |
| Mid - Accelerate regeneration (1000                 |      |      |      |      |      |      | 113   |
| hectares)   |      |      |      |      |      |      |       |
|   |      |      |      |      |      |      | 110   |
| Land impacted for carbon sink potential -           |      |      |      |      |      |      | 110   |
| Mid - Avoid deforestation (over 30 years)           |      |      |      |      |      |      |       |
| (1000 hectares)                                     |      |      |      |      |      |      | 0.400 |
| Land impacted for carbon sink potential -           |      |      |      |      |      |      | 2,680 |
| Mid - Extend rotation length (1000                  |      |      |      |      |      |      |       |
| hectares)   |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -           |      |      |      |      |      |      | 2.93  |
| Mid - Improve plantations (1000 hectares)           |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -           |      |      |      |      |      |      | 0     |
| Mid - Increase retention of HWP (1000               |      |      |      |      |      |      |       |
| hectares)   |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -           |      |      |      |      |      |      | 24.1  |
| Mid - Increase trees outside forests (1000          |      |      |      |      |      |      |       |
| hectares)   |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -           |      |      |      |      |      |      | 118   |
| Mid - Reforest cropland (1000 hectares)             |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -           |      |      |      |      |      |      | 47.3  |
| Mid - Reforest pasture (1000 hectares)              |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -           |      |      |      |      |      |      | 1,879 |
| Mid - Restore productivity (1000                    |      |      |      |      |      |      | .,    |
| hectares)   |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -           |      |      |      |      |      |      | 5,034 |
| Mid - Total impacted (over 30 years) (1000          |      |      |      |      |      |      | 0,004 |
| hectares)   |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -           |      |      |      |      |      | +    | 231   |
| High - Accelerate regeneration (1000                |      |      |      |      |      |      | 231   |
|   |      |      |      |      |      |      |       |
| hectares) Land impacted for carbon sink potential - |      |      |      |      |      |      | 113   |
| ·   |      |      |      |      |      |      | 113   |
| High - Avoid deforestation (over 30 years)          |      |      |      |      |      |      |       |
| (1000 hectares)                                     |      |      |      |      |      |      | 0.07/ |
| Land impacted for carbon sink potential -           |      |      |      |      |      |      | 3,876 |
| High - Extend rotation length (1000                 |      |      |      |      |      |      |       |
| hectares)   |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -           |      |      |      |      |      |      | 3.9   |
| High - Improve plantations (1000                    |      |      |      |      |      |      |       |
| hectares)   |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -           |      |      |      |      |      |      | 0     |
| High - Increase retention of HWP (1000              |      |      |      |      |      |      |       |
| hectares)   |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -           |      |      |      |      |      |      | 31.5  |
| High - Increase trees outside forests               |      |      |      |      |      |      |       |
| (1000 hectares)                                     |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -           |      |      |      |      |      |      | 157   |
| High - Reforest cropland (1000 hectares)            |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -           |      |      |      |      |      |      | 37.8  |
| High - Reforest pasture (1000 hectares)             |      |      |      |      |      |      | 01.0  |
| Land impacted for carbon sink potential -           |      |      |      |      |      | +    | 1,542 |
| High - Restore productivity (1000                   |      |      |      |      |      |      | 1,542 |
|   |      |      |      |      |      |      |       |
| hectares)   |      |      |      |      |      |      | F 000 |
| Land impacted for carbon sink potential -           |      |      |      |      |      |      | 5,992 |
| High - Total impacted (over 30 years)               |      |      |      |      |      |      |       |
| (1000 hectares)                                     |      |      |      |      |      |      |       |

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

| Item                                     | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050  |
|--|------|------|------|------|------|------|-------|
| Carbon sink potential - Moderate         |      |      |      |      |      |      | 0     |
| deployment - Corn-ethanol to energy      |      |      |      |      |      |      |       |
| grasses (1000 tC02e/y)                   |      |      |      |      |      |      |       |
| Carbon sink potential - Moderate         |      |      |      |      |      |      | -184  |
| deployment - Cropland measures (1000     |      |      |      |      |      |      |       |
| tCO2e/y)                                 |      |      |      |      |      |      |       |
| Carbon sink potential - Moderate         |      |      |      |      |      |      | -7.84 |
| deployment - Permanent conservation      |      |      |      |      |      |      |       |
| cover (1000 tCO2e/y)                     |      |      |      |      |      |      |       |
| Carbon sink potential - Moderate         |      |      |      |      |      |      | -192  |
| deployment - Total (1000 tCO2e/y)        |      |      |      |      |      |      |       |
| Carbon sink potential - Aggressive       |      |      |      |      |      |      | 0     |
| deployment - Corn-ethanol to energy      |      |      |      |      |      |      |       |
| grasses (1000 tCO2e/y)                   |      |      |      |      |      |      |       |
| Carbon sink potential - Aggressive       |      |      |      |      |      |      | -360  |
| deployment - Cropland measures (1000     |      |      |      |      |      |      |       |
| tCO2e/y)                                 |      |      |      |      |      |      |       |
| Carbon sink potential - Aggressive       |      |      |      |      |      |      | -15.7 |
| deployment - Permanent conservation      |      |      |      |      |      |      |       |
| cover (1000 tC02e/y)                     |      |      |      |      |      |      |       |
| Carbon sink potential - Aggressive       |      |      |      |      |      |      | -376  |
| deployment - Total (1000 tCO2e/y)        |      |      |      |      |      |      |       |
| Land impacted for carbon sink - Moderate |      |      |      |      |      |      | 0     |
| deployment - Corn-ethanol to energy      |      |      |      |      |      |      |       |
| grasses (1000 hectares)                  |      |      |      |      |      |      |       |
| Land impacted for carbon sink - Moderate |      |      |      |      |      |      | 329   |
| deployment - Cropland measures (1000     |      |      |      |      |      |      |       |
| hectares)                                |      |      |      |      |      |      |       |
| Land impacted for carbon sink - Moderate |      |      |      |      |      |      | 12.1  |
| deployment - Permanent conservation      |      |      |      |      |      |      |       |
| cover (1000 hectares)                    |      |      |      |      |      |      |       |
| Land impacted for carbon sink - Moderate |      |      |      |      |      |      | 341   |
| deployment - Total (1000 hectares)       |      |      |      |      |      |      | •     |
| Land impacted for carbon sink -          |      |      |      |      |      |      | 0     |
| Aggressive deployment - Corn-ethanol to  |      |      |      |      |      |      | Ū     |
| energy grasses (1000 hectares)           |      |      |      |      |      |      |       |
| Land impacted for carbon sink -          |      |      |      |      |      |      | 646   |
| Aggressive deployment - Cropland         |      |      |      |      |      |      | 0-10  |
| measures (1000 hectares)                 |      |      |      |      |      |      |       |
| Land impacted for carbon sink -          |      |      |      |      |      |      | 24.1  |
| Aggressive deployment - Permanent        |      |      |      |      |      |      | ∠4.1  |
| conservation cover (1000 hectares)       |      |      |      |      |      |      |       |
| Land impacted for carbon sink -          |      |      |      |      |      |      | 670   |
| Aggressive deployment - Total (1000      |      |      |      |      |      |      | טוט   |
|  |      |      |      |      |      |      |       |
| hectares)                                |      |      |      |      |      |      |       |

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

| Item   | 2020 | 2025 | 2030  | 2035  | 2040  | 2045  | 2050  |
|--|------|------|-------|-------|-------|-------|-------|
| Premature deaths from air pollution -              |      | 17.8 | 0.021 | 0.021 | 0.018 | 0.012 | 0     |
| Fuel Comb - Electric Generation - Coal<br>(deaths) |      |      |       |       |       |       |       |
| Premature deaths from air pollution -              |      | 4.69 | 3.19  | 2.81  | 3.24  | 2.4   | 0.758 |
| Fuel Comb - Electric Generation - Natural          |      | 4.07 | 5.17  | 2.01  | 3.24  | 2.4   | 0.130 |
| Gas (deaths)                                       |      |      |       |       |       |       |       |
| Premature deaths from air pollution -              |      | 83.8 | 81.5  | 64.3  | 38.3  | 18    | 7.23  |
| Mobile - On-Road (deaths)                          |      |      |       |       |       |       |       |
| Premature deaths from air pollution - Gas          |      | 3.94 | 3.78  | 3     | 1.9   | 1.04  | 0.599 |
| Stations (deaths)                                  |      |      |       |       |       |       |       |

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

| Item   | 2020 | 2025  | 2030  | 2035  | 2040  | 2045  | 2050  |
|--|------|-------|-------|-------|-------|-------|-------|
| Premature deaths from air pollution -<br>Fuel Comb - Residential - Natural Gas                             |      | 16.6  | 15.9  | 12.3  | 7.43  | 3.73  | 1.49  |
| (deaths)  Premature deaths from air pollution - Fuel Comb - Residential - Oil (deaths)                     |      | 0.075 | 0.068 | 0.054 | 0.039 | 0.028 | 0.019 |
| Premature deaths from air pollution - Fuel Comb - Residential - Other (deaths)                             |      | 0.626 | 0.623 | 0.533 | 0.39  | 0.241 | 0.134 |
| Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Coal (deaths)                       |      | 0.053 | 0.053 | 0.052 | 0.051 | 0.05  | 0.048 |
| Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Natural Gas (deaths)                |      | 5.19  | 4.84  | 3.82  | 2.47  | 1.34  | 0.6   |
| Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Oil (deaths)                        |      | 0.423 | 0.351 | 0.286 | 0.224 | 0.165 | 0.11  |
| Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Other (deaths)                      |      | 0.842 | 0.734 | 0.62  | 0.499 | 0.376 | 0.253 |
| Premature deaths from air pollution - Industrial Processes - Coal Mining (deaths)                          |      | 0.161 | 0.025 | 0.024 | 0.022 | 0.021 | 0.007 |
| Premature deaths from air pollution - Industrial Processes - Oil & Gas Production (deaths)                 |      | 21.7  | 21.5  | 21.7  | 18.8  | 16    | 12.1  |
| Monetary damages from air pollution -<br>Fuel Comb - Electric Generation - Coal<br>(million \$2019)        |      | 158   | 0.183 | 0.183 | 0.163 | 0.107 | 0     |
| Monetary damages from air pollution -<br>Fuel Comb - Electric Generation - Natural<br>Gas (million \$2019) |      | 41.6  | 28.3  | 24.9  | 28.7  | 21.3  | 6.72  |
| Monetary damages from air pollution -<br>Mobile - On-Road (million \$2019)                                 |      | 745   | 724   | 572   | 341   | 160   | 64.3  |
| Monetary damages from air pollution -<br>Gas Stations (million \$2019)                                     |      | 34.9  | 33.5  | 26.6  | 16.8  | 9.17  | 5.31  |
| Monetary damages from air pollution -<br>Fuel Comb - Residential - Natural Gas<br>(million \$2019)         |      | 147   | 141   | 109   | 65.8  | 33.1  | 13.2  |
| Monetary damages from air pollution -<br>Fuel Comb - Residential - Oil (million<br>\$2019)                 |      | 0.668 | 0.6   | 0.479 | 0.347 | 0.244 | 0.165 |
| Monetary damages from air pollution -<br>Fuel Comb - Residential - Other (million<br>\$2019)               |      | 5.55  | 5.52  | 4.73  | 3.46  | 2.13  | 1.19  |
| Monetary damages from air pollution -<br>Fuel Comb - Comm/Institutional - Coal<br>(million \$2019)         |      | 0.473 | 0.47  | 0.463 | 0.453 | 0.439 | 0.422 |
| Monetary damages from air pollution -<br>Fuel Comb - Comm/Institutional - Natural<br>Gas (million \$2019)  |      | 46    | 42.9  | 33.8  | 21.9  | 11.9  | 5.31  |
| Monetary damages from air pollution -<br>Fuel Comb - Comm/Institutional - Oil<br>(million \$2019)          |      | 3.75  | 3.11  | 2.54  | 1.98  | 1.46  | 0.971 |
| Monetary damages from air pollution -<br>Fuel Comb - Comm/Institutional - Other<br>(million \$2019)        |      | 7.46  | 6.49  | 5.48  | 4.42  | 3.33  | 2.24  |
| Monetary damages from air pollution - Industrial Processes - Coal Mining (million \$2019)                  |      | 1.42  | 0.223 | 0.213 | 0.193 | 0.184 | 0.062 |

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

| Item                                  | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---------------------------------------|------|------|------|------|------|------|------|
| Monetary damages from air pollution - |      | 192  | 191  | 192  | 167  | 142  | 108  |
| Industrial Processes - Oil & Gas      |      |      |      |      |      |      |      |
| Production (million \$2019)           |      |      |      |      |      |      |      |

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

| Table 39: E+RE- Scenario - IMPACIS - Jobs    |      |        |          |        |        |         |         |
|--|------|--------|----------|--------|--------|---------|---------|
| Item   | 2020 | 2025   | 2030     | 2035   | 2040   | 2045    | 2050    |
| By economic sector - Agriculture (jobs)      |      | 4.81   | 24.3     | 13.9   | 9.5    | 6.25    | 17.3    |
| By economic sector - Construction (jobs)     |      | 6,154  | 6,789    | 7,149  | 7,840  | 7,038   | 6,871   |
| By economic sector - Manufacturing           |      | 4,165  | 4,200    | 4,551  | 4,308  | 3,193   | 3,010   |
| (jobs)                                       |      |        |          |        |        |         |         |
| By economic sector - Mining (jobs)           |      | 4,911  | 3,555    | 2,810  | 1,969  | 1,387   | 903     |
| By economic sector - Other (jobs)            |      | 690    | 764      | 832    | 973    | 1,045   | 1,374   |
| By economic sector - Pipeline (jobs)         |      | 409    | 372      | 345    | 289    | 233     | 187     |
| By economic sector - Professional (jobs)     |      | 3,227  | 3,363    | 3,429  | 3,675  | 3,402   | 3,451   |
| By economic sector - Trade (jobs)            |      | 3,059  | 2,781    | 2,718  | 2,701  | 2,492   | 2,562   |
| By economic sector - Utilities (jobs)        |      | 4,885  | 6,161    | 6,798  | 8,134  | 6,777   | 5,354   |
| By resource sector - Biomass (jobs)          |      | 16.8   | 62.4     | 47.5   | 35.5   | 24.5    | 72      |
| By resource sector - CO2 (jobs)              |      | 0      | 0        | 0      | 0      | 0       | 57      |
| By resource sector - Coal (jobs)             |      | 2,598  | 1,040    | 528    | 459    | 414     | 351     |
| By resource sector - Grid (jobs)             |      | 6,654  | 9,922    | 11,799 | 14,331 | 11,520  | 9,275   |
| By resource sector - Natural Gas (jobs)      |      | 5,007  | 4,626    | 4,268  | 4,170  | 3,706   | 2,540   |
| By resource sector - Nuclear (jobs)          |      | 0      | 0        | 0      | 0      | 0       | 0       |
| By resource sector - Oil (jobs)              |      | 6,801  | 5,928    | 5,041  | 3,591  | 2,673   | 1,833   |
| By resource sector - Solar (jobs)            |      | 5,299  | 4,782    | 4,742  | 5,096  | 5,441   | 7,977   |
| By resource sector - Wind (jobs)             |      | 1,129  | 1,652    | 2,217  | 2,215  | 1,794   | 1,625   |
| By education level - All sectors - High      |      | 11,573 | 11,774   | 12,110 | 12,672 | 10,815  | 10,045  |
| school diploma or less (jobs)                |      |        |          |        |        |         |         |
| By education level - All sectors -           |      | 8,394  | 8,704    | 8,993  | 9,540  | 8,196   | 7,623   |
| Associates degree or some college (jobs)     |      |        |          |        |        |         |         |
| By education level - All sectors -           |      | 5,924  | 5,912    | 5,922  | 6,025  | 5,125   | 4,719   |
| Bachelors degree (jobs)                      |      |        |          |        |        |         | •       |
| By education level - All sectors - Masters   |      | 1,414  | 1,424    | 1,425  | 1,464  | 1,261   | 1,172   |
| or professional degree (jobs)                |      | ,      | <i>,</i> | , -    | , -    | , -     | ,       |
| By education level - All sectors - Doctoral  |      | 200    | 198      | 194    | 197    | 175     | 170     |
| degree (jobs)                                |      |        |          |        |        |         |         |
| Related work experience - All sectors -      |      | 3,890  | 4,011    | 4,122  | 4,339  | 3,723   | 3,459   |
| None (jobs)                                  |      | ,      |          |        |        |         | •       |
| Related work experience - All sectors - Up   |      | 5,411  | 5,473    | 5,619  | 5,868  | 5,029   | 4,750   |
| to 1 year (jobs)                             |      | -,     | , -      | -,-    | -,     | -,-     | ,       |
| Related work experience - All sectors - 1    |      | 10,081 | 10,218   | 10,416 | 10,836 | 9,262   | 8,558   |
| to 4 years (jobs)                            |      | .,     | , -      | ,      | ,      | , -     | -,      |
| Related work experience - All sectors - 4    |      | 6,392  | 6,548    | 6,689  | 6,996  | 5,985   | 5,519   |
| to 10 years (jobs)                           |      | 5,51   | 5,5 15   | 5,551  | 7, 10  | 7, 55   | -,      |
| Related work experience - All sectors -      |      | 1,731  | 1,762    | 1,797  | 1,859  | 1,573   | 1,443   |
| Over 10 years (jobs)                         |      | , -    | , -      | ,      | ,      | ,       | , -     |
| On-the-Job Training - All sectors - None     |      | 1,507  | 1,509    | 1,524  | 1,569  | 1,352   | 1,284   |
| (jobs)                                       |      | .,001  | .,007    | .,62 . | .,007  | .,002   | .,_0 .  |
| On-the-Job Training - All sectors - Up to 1  |      | 18,340 | 18,523   | 18,894 | 19,583 | 16,690  | 15,493  |
| year (jobs)                                  |      | ,.     | ,        | ,      | ,      | ,       | ,       |
| On-the-Job Training - All sectors - 1 to 4   |      | 5,676  | 5,884    | 6,058  | 6,411  | 5,498   | 5,067   |
| years (jobs)                                 |      | 0,0.0  | 3,33 .   | 3,000  | 9,     | 0, ., 0 | 3,55.   |
| On-the-Job Training - All sectors - 4 to 10  |      | 1,719  | 1,830    | 1,897  | 2,057  | 1,796   | 1,662   |
| years (jobs)                                 |      | .,,    | .,000    | 1,671  | 2,001  | 1,1.70  | 1,002   |
| On-the-Job Training - All sectors - Over 10  |      | 263    | 266      | 271    | 278    | 237     | 225     |
| years (jobs)                                 |      | 200    | 200      |        | 2.0    | 20.     | 220     |
| On-Site or In-Plant Training - All sectors - |      | 4,382  | 4,454    | 4,538  | 4,719  | 4,052   | 3,813   |
| None (jobs)                                  |      | .,002  | .,,,,,,  | .,000  | .,, ., | .,002   | 3,010   |
| On-Site or In-Plant Training - All sectors - |      | 16,673 | 16,848   | 17,194 | 17,846 | 15,212  | 14,101  |
| Up to 1 year (jobs)                          |      | 10,010 | 10,040   | 11,174 | 11,040 | 10,212  | 1-1,101 |
| op to i your (Jobo)                          |      |        |          |        |        |         |         |

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

| Item   | 2020 | 2025  | 2030  | 2035  | 2040  | 2045  | 2050  |
|--|------|-------|-------|-------|-------|-------|-------|
| On-Site or In-Plant Training - All sectors - |      | 4,436 | 4,582 | 4,714 | 4,974 | 4,261 | 3,931 |
| 1 to 4 years (jobs)                          |      |       |       |       |       |       |       |
| On-Site or In-Plant Training - All sectors - |      | 1,798 | 1,894 | 1,952 | 2,093 | 1,819 | 1,674 |
| 4 to 10 years (jobs)                         |      |       |       |       |       |       |       |
| On-Site or In-Plant Training - All sectors - |      | 218   | 234   | 245   | 265   | 229   | 211   |
| Over 10 years (jobs)                         |      |       |       |       |       |       |       |
| Wage income - All (million \$2019)           |      | 1,479 | 1,522 | 1,567 | 1,650 | 1,424 | 1,318 |

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

| Item                                   | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|------|------|------|------|------|------|------|
| Final energy use - Transportation (PJ) | 304  | 290  | 260  | 223  | 188  | 168  | 161  |
| Final energy use - Residential (PJ)    | 126  | 122  | 118  | 106  | 90.4 | 79.2 | 72.3 |
| Final energy use - Commercial (PJ)     | 103  | 103  | 101  | 94.8 | 87.6 | 82.5 | 80.3 |
| Final energy use - Industry (PJ)       | 86.5 | 89.3 | 90.2 | 96.9 | 111  | 116  | 122  |

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

| Item  | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|------|------|------|------|------|------|------|
| Electricity distribution capital invested - |      | 1.72 | 1.81 | 3.2  | 3.44 | 3.67 | 3.91 |
| Cumulative 5-yr (billion \$2018)            |      |      |      |      |      |      |      |

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

| Item   | 2020  | 2025  | 2030  | 2035  | 2040  | 2045  | 2050  |
|--|-------|-------|-------|-------|-------|-------|-------|
| Vehicle stocks - LDV – EV (1000 units)   | 48.6  | 240   | 431   | 1,101 | 1,770 | 2,306 | 2,841 |
| Vehicle stocks - LDV – All others (1000 units)                                 | 2,369 | 2,255 | 2,142 | 1,561 | 980   | 554   | 129   |
| Light-duty vehicle capital costs vs. REF -<br>Cumulative 5-yr (million \$2018) |       | 449   | 1,171 | 1,866 | 2,839 | 3,076 | 2,940 |
| Public EV charging plugs - DC Fast (1000 units)                                | 0.174 |       | 0.748 |       | 3.07  |       | 4.93  |
| Public EV charging plugs - L2 (1000 units)                                     | 1.07  |       | 18    |       | 73.9  |       | 119   |

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

| Item                                       | 2020  | 2025 | 2030 | 2035  | 2040  | 2045  | 2050  |
|--|-------|------|------|-------|-------|-------|-------|
| Sales of space heating units - Electric    | 3.03  | 9.9  | 34.8 | 79.5  | 87.6  | 88.4  | 88.2  |
| Heat Pump (%)                              |       |      |      |       |       |       |       |
| Sales of space heating units - Electric    | 3.81  | 7.35 | 5.69 | 2.51  | 1.97  | 1.95  | 1.97  |
| Resistance (%)                             |       |      |      |       |       |       |       |
| Sales of space heating units - Gas (%)     | 89.6  | 73.5 | 50.6 | 9.98  | 2.86  | 2.43  | 2.43  |
| Sales of space heating units - Fossil (%)  | 3.57  | 9.24 | 8.91 | 8.06  | 7.57  | 7.25  | 7.38  |
| Sales of water heating units - Electric    | 0     | 1.51 | 15.7 | 41.6  | 46.2  | 46.5  | 46.5  |
| Heat Pump (%)                              |       |      |      |       |       |       |       |
| Sales of water heating units - Electric    | 7.01  | 15.7 | 26.3 | 48.5  | 52.5  | 52.7  | 52.7  |
| Resistance (%)                             |       |      |      |       |       |       |       |
| Sales of water heating units - Gas Furnace | 92.3  | 82   | 57.3 | 9.09  | 0.535 | 0     | 0     |
| (%)  |       |      |      |       |       |       |       |
| Sales of water heating units - Other (%)   | 0.642 | 0.79 | 0.79 | 0.787 | 0.779 | 0.778 | 0.778 |
| Sales of cooking units - Electric          | 37.1  | 50.5 | 91.5 | 99.6  | 100   | 100   | 100   |
| Resistance (%)                             |       |      |      |       |       |       |       |
| Sales of cooking units - Gas (%)           | 62.9  | 49.5 | 8.47 | 0.426 | 0     | 0     | 0     |
| Residential HVAC investment in 2020s vs.   |       | 2.76 | 3.21 |       |       |       |       |
| REF - Cumulative 5-yr (billion \$2018)     |       |      |      |       |       |       |       |

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

| Item                                      | 2020  | 2025  | 2030  | 2035  | 2040  | 2045  | 2050  |
|---|-------|-------|-------|-------|-------|-------|-------|
| Sales of space heating units - Electric   | 0.749 | 8.98  | 33.5  | 81.9  | 90.4  | 91    | 91    |
| Heat Pump (%)                             |       |       |       |       |       |       |       |
| Sales of space heating units - Electric   | 0.855 | 3.41  | 4.83  | 7.94  | 8.5   | 8.54  | 8.55  |
| Resistance (%)                            |       |       |       |       |       |       |       |
| Sales of space heating units - Gas (%)    | 98.4  | 87.4  | 61.6  | 10.2  | 1.06  | 0.491 | 0.49  |
| Sales of space heating units - Fossil (%) | 0     | 0.208 | 0.04  | 0.002 | 0     | 0     | 0     |
| Sales of water heating units - Electric   | 0.008 | 1.61  | 16.7  | 45    | 50    | 50.3  | 50.3  |
| Heat Pump (%)                             |       |       |       |       |       |       |       |
| Sales of water heating units - Electric   | 0.41  | 2.69  | 16.3  | 44.1  | 49    | 49.3  | 49.3  |
| Resistance (%)                            |       |       |       |       |       |       |       |
| Sales of water heating units - Gas (%)    | 99.5  | 95.3  | 66.6  | 10.6  | 0.622 | 0     | 0     |
| Sales of water heating units - Other (%)  | 0.1   | 0.381 | 0.381 | 0.382 | 0.381 | 0.381 | 0.381 |
| Sales of cooking units - Electric         | 41.9  | 54.6  | 83    | 88.6  | 88.9  | 88.9  | 88.9  |
| Resistance (%)                            |       |       |       |       |       |       |       |
| Sales of cooking units - Gas (%)          | 58.1  | 45.4  | 17    | 11.4  | 11.1  | 11.1  | 11.1  |
| Commercial HVAC investment in 2020s -     |       | 7,533 | 8,381 |       |       |       |       |
| Cumulative 5-yr (million \$2018)          |       |       |       |       |       |       |       |

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

| Item  | 2020  | 2025  | 2030  | 2035  | 2040   | 2045   | 2050   |
|---|-------|-------|-------|-------|--------|--------|--------|
| Installed thermal - Coal (MW)   | 4,894 | 3,250 | 0     | 0     | 0      | 0      | 0      |
| Installed thermal - Natural gas (MW)  | 2,926 | 2,933 | 4,654 | 5,524 | 6,790  | 6,910  | 6,101  |
| Installed thermal - Nuclear (MW)  | 0     | 0     | 0     | 0     | 0      | 0      | 0      |
| Installed renewables - Rooftop PV (MW)  | 540   | 833   | 1,113 | 1,450 | 1,851  | 2,318  | 2,871  |
| Installed renewables - Solar - Base land use assumptions (MW)                   | 2,257 | 3,429 | 4,275 | 4,632 | 5,170  | 6,025  | 6,025  |
| Installed renewables - Wind - Base land use assumptions (MW)                    | 547   | 648   | 2,256 | 6,188 | 9,180  | 10,692 | 12,254 |
| Installed renewables - Solar -<br>Constrained land use assumptions (MW)         | 846   | 1,192 | 1,192 | 1,192 | 3,836  | 6,047  | 6,047  |
| Installed renewables - Wind - Constrained land use assumptions (MW)             | 1,102 | 1,672 | 3,024 | 7,459 | 10,294 | 11,835 | 12,748 |
| Installed renewables - Offshore Wind -<br>Constrained land use assumptions (MW) | 0     | 0     | 0     | 0     | 0      | 0      | 0      |
| Capital invested - Solar PV - Base (billion<br>\$2018)                          |       | 1.57  | 1.01  | 0.394 | 0.559  | 0.839  | 0      |
| Capital invested - Wind - Base (billion<br>\$2018)                              |       | 0.149 | 2.14  | 4.88  | 3.54   | 1.7    | 1.52   |
| Capital invested - Solar PV - Constrained (billion \$2018)                      |       | 0.463 | 0     | 0     | 2.75   | 2.17   | 0      |
| Capital invested - Wind - Constrained (billion \$2018)                          |       | 0.838 | 1.8   | 5.5   | 3.35   | 1.73   | 0.966  |

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

| Item                                     | 2020  | 2025  | 2030  | 2035   | 2040   | 2045   | 2050   |
|--|-------|-------|-------|--------|--------|--------|--------|
| Solar - Base land use assumptions (GWh)  | 5,120 | 7,580 | 9,365 | 10,069 | 11,200 | 12,995 | 12,995 |
| Wind - Base land use assumptions (GWh)   | 1,617 | 1,915 | 6,527 | 17,598 | 25,700 | 29,753 | 33,712 |
| OffshoreWind - Base land use             | 0     | 0     | 0     | 0      | 0      | 0      | 0      |
| assumptions (GWh)                        |       |       |       |        |        |        |        |
| Solar - Constrained land use assumptions | 2,203 | 2,914 | 2,914 | 2,914  | 8,694  | 13,579 | 13,579 |
| (GWh)                                    |       |       |       |        |        |        |        |
| Wind - Constrained land use assumptions  | 3,189 | 4,803 | 8,587 | 19,993 | 26,629 | 30,153 | 32,202 |
| (GWh)                                    |       |       |       |        |        |        |        |
| OffshoreWind - Constrained land use      | 0     | 0     | 0     | 0      | 0      | 0      | 0      |
| assumptions (GWh)                        |       |       |       |        |        |        |        |

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

| Item                                      | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050    |
|---|------|------|------|------|------|------|---------|
| Carbon sink potential - Low - Accelerate  | 2020 | 2020 | 2030 | 2000 | 2040 | 2040 | -707    |
| regeneration (1000 tCO2e/y)               |      |      |      |      |      |      | 101     |
| Carbon sink potential - Low - Avoid       |      |      |      |      |      |      | -140    |
| deforestation (1000 tC02e/y)              |      |      |      |      |      |      | 140     |
| Carbon sink potential - Low - Extend      |      |      |      |      |      |      | -2,919  |
| rotation length (1000 tC02e/y)            |      |      |      |      |      |      | 2,7.17  |
| Carbon sink potential - Low - Improve     |      |      |      |      |      | -    | -5.38   |
| plantations (1000 tC02e/y)                |      |      |      |      |      |      | 0.00    |
| Carbon sink potential - Low - Increase    |      |      |      |      |      |      | -9.92   |
| retention of HWP (1000 tCO2e/y)           |      |      |      |      |      |      | 7.72    |
| Carbon sink potential - Low - Increase    |      |      |      |      |      |      | -116    |
| trees outside forests (1000 tC02e/y)      |      |      |      |      |      |      | 110     |
| Carbon sink potential - Low - Reforest    |      |      |      |      |      | -    | -1,189  |
| cropland (1000 tCO2e/y)                   |      |      |      |      |      |      | 1,107   |
| Carbon sink potential - Low - Reforest    |      |      |      |      |      |      | -101    |
| pasture (1000 tC02e/y)                    |      |      |      |      |      |      | -101    |
| Carbon sink potential - Low - Restore     |      |      |      |      |      |      | -1,568  |
| productivity (1000 tC02e/y)               |      |      |      |      |      |      | -1,500  |
| Carbon sink potential - Low - All (not    |      |      |      |      |      |      | -6,755  |
| counting overlap) (1000 tCO2e/y)          |      |      |      |      |      |      | -0,133  |
| Carbon sink potential - Mid - Accelerate  |      |      |      |      |      |      | -1,060  |
| regeneration (1000 tCO2e/y)               |      |      |      |      |      |      | -1,000  |
| Carbon sink potential - Mid - Avoid       |      |      |      |      |      |      | -489    |
| deforestation (1000 tCO2e/y)              |      |      |      |      |      |      | -469    |
| •   |      |      |      |      |      |      | F 0/ 0  |
| Carbon sink potential - Mid - Extend      |      |      |      |      |      |      | -5,260  |
| rotation length (1000 tC02e/y)            |      |      |      |      |      |      | 7.00    |
| Carbon sink potential - Mid - Improve     |      |      |      |      |      |      | -7.89   |
| plantations (1000 tC02e/y)                |      |      |      |      |      |      | 10.0    |
| Carbon sink potential - Mid - Increase    |      |      |      |      |      |      | -19.8   |
| retention of HWP (1000 tC02e/y)           |      |      |      |      |      |      |         |
| Carbon sink potential - Mid - Increase    |      |      |      |      |      |      | -224    |
| trees outside forests (1000 tC02e/y)      |      |      |      |      |      |      | 1700    |
| Carbon sink potential - Mid - Reforest    |      |      |      |      |      |      | -1,783  |
| cropland (1000 tC02e/y)                   |      |      |      |      |      |      |         |
| Carbon sink potential - Mid - Reforest    |      |      |      |      |      |      | -715    |
| pasture (1000 tCO2e/y)                    |      |      |      |      |      |      |         |
| Carbon sink potential - Mid - Restore     |      |      |      |      |      |      | -3,109  |
| productivity (1000 tCO2e/y)               |      |      |      |      |      |      |         |
| Carbon sink potential - Mid - All (not    |      |      |      |      |      |      | -12,667 |
| counting overlap) (1000 tCO2e/y)          |      |      |      |      |      |      |         |
| Carbon sink potential - High - Accelerate |      |      |      |      |      |      | -1,412  |
| regeneration (1000 tCO2e/y)               |      |      |      |      |      |      |         |
| Carbon sink potential - High - Avoid      |      |      |      |      |      |      | -838    |
| deforestation (1000 tCO2e/y)              |      |      |      |      |      |      |         |
| Carbon sink potential - High - Extend     |      |      |      |      |      |      | -7,600  |
| rotation length (1000 tCO2e/y)            |      |      |      |      |      |      |         |
| Carbon sink potential - High - Improve    |      |      |      |      |      |      | -10.6   |
| plantations (1000 tCO2e/y)                |      |      |      |      |      |      |         |
| Carbon sink potential - High - Increase   |      |      |      |      |      |      | -29.8   |
| retention of HWP (1000 tCO2e/y)           |      |      |      |      |      |      |         |
| Carbon sink potential - High - Increase   |      |      |      |      |      |      | -332    |
| trees outside forests (1000 tC02e/y)      |      |      |      |      |      |      |         |
| Carbon sink potential - High - Reforest   |      |      |      |      |      |      | -2,378  |
| cropland (1000 tCO2e/y)                   |      |      |      |      |      |      |         |
| Carbon sink potential - High - Reforest   |      |      |      |      |      | +    | -1,329  |
| pasture (1000 tC02e/y)                    |      |      |      |      |      |      | .,      |
| Carbon sink potential - High - All (not   |      |      |      |      |      |      | -18,580 |
| counting overlap) (1000 tCO2e/y)          |      |      |      |      |      |      | .5,555  |
| Carbon sink potential - High - Restore    |      |      |      |      |      | +    | -4,651  |
| productivity (1000 tCO2e/y)               |      |      |      |      |      |      | 1,501   |
| p. 3000, (.000 t0020//)                   |      |      |      |      |      |      |         |

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

| Item   | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 205  |
|--|------|------|------|------|------|------|------|
| Land impacted for carbon sink potential -<br>Low - Accelerate regeneration (1000     |      |      |      |      |      |      | 11   |
| hectares)  |      |      |      |      |      |      |      |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 10   |
| Low - Avoid deforestation (over 30 years)  |      |      |      |      |      |      | 10   |
| (1000 hectares)  |      |      |      |      |      |      |      |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 1,48 |
| Low - Extend rotation length (1000   |      |      |      |      |      |      |      |
| hectares)  |      |      |      |      |      |      |      |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 1.9  |
| Low - Improve plantations (1000  |      |      |      |      |      |      |      |
| hectares)  |      |      |      |      |      |      |      |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | (    |
| Low - Increase retention of HWP (1000  |      |      |      |      |      |      |      |
| hectares)  |      |      |      |      |      |      |      |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 16.  |
| Low - Increase trees outside forests   |      |      |      |      |      |      |      |
| (1000 hectares)  |      |      |      |      |      |      | 78.  |
| Land impacted for carbon sink potential -<br>Low - Reforest cropland (1000 hectares) |      |      |      |      |      |      | 10.  |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 6.5  |
| Low - Reforest pasture (1000 hectares)   |      |      |      |      |      |      | 0.0  |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 93   |
| Low - Restore productivity (1000   |      |      |      |      |      |      | ,0   |
| hectares)  |      |      |      |      |      |      |      |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 2,74 |
| Low - Total impacted (over 30 years)   |      |      |      |      |      |      |      |
| (1000 hectares)  |      |      |      |      |      |      |      |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 17   |
| Mid - Accelerate regeneration (1000  |      |      |      |      |      |      |      |
| hectares)  |      |      |      |      |      |      |      |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 11   |
| Mid - Avoid deforestation (over 30 years)  |      |      |      |      |      |      |      |
| (1000 hectares)  |      |      |      |      |      |      |      |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 2,68 |
| Mid - Extend rotation length (1000   |      |      |      |      |      |      |      |
| hectares) Land impacted for carbon sink potential -                                  |      |      |      |      |      |      | 2.9  |
| Mid - Improve plantations (1000 hectares)  |      |      |      |      |      |      | 2.7  |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 1    |
| Mid - Increase retention of HWP (1000  |      |      |      |      |      |      |      |
| hectares)  |      |      |      |      |      |      |      |
| Land impacted for carbon sink potential -  |      |      |      |      | +    |      | 24   |
| Mid - Increase trees outside forests (1000   |      |      |      |      |      |      |      |
| hectares)  |      |      |      |      |      |      |      |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 11   |
| Mid - Reforest cropland (1000 hectares)  |      |      |      |      |      |      |      |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 47.  |
| Mid - Reforest pasture (1000 hectares)   |      |      |      |      |      |      |      |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 1,87 |
| Mid - Restore productivity (1000   |      |      |      |      |      |      |      |
| hectares)  |      |      |      |      |      |      |      |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 5,03 |
| Mid - Total impacted (over 30 years) (1000   |      |      |      |      |      |      |      |
| hectares)  |      |      |      |      |      |      |      |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 23   |
| High - Accelerate regeneration (1000   |      |      |      |      |      |      |      |
| hectares) Land impacted for carbon sink potential -                                  |      |      |      |      |      |      | 11   |
| High - Avoid deforestation (over 30 years)   |      |      |      |      |      |      | 11   |
| (1000 hectares)  |      |      |      |      |      |      |      |

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 - |      |      |      |      |      |      | 3,876 |
| High - Extend rotation length (1000       |      |      |      |      |      |      |       |
| hectares)                                 |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential - |      |      |      |      |      |      | 3.9   |
| High - Improve plantations (1000          |      |      |      |      |      |      |       |
| hectares)                                 |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential - |      |      |      |      |      |      | 0     |
| High - Increase retention of HWP (1000    |      |      |      |      |      |      |       |
| hectares)                                 |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential - |      |      |      |      |      |      | 31.5  |
| High - Increase trees outside forests     |      |      |      |      |      |      |       |
| (1000 hectares)                           |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential - |      |      |      |      |      |      | 157   |
| High - Reforest cropland (1000 hectares)  |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential - |      |      |      |      |      |      | 37.8  |
| High - Reforest pasture (1000 hectares)   |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential - |      |      |      |      |      |      | 1,542 |
| High - Restore productivity (1000         |      |      |      |      |      |      |       |
| hectares)                                 |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential - |      |      |      |      |      |      | 5,992 |
| High - Total impacted (over 30 years)     |      |      |      |      |      |      |       |
| (1000 hectares)                           |      |      |      |      |      |      |       |

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

| Item   | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050  |
|--|------|------|------|------|------|------|-------|
| Carbon sink potential - Moderate<br>deployment - Corn-ethanol to energy<br>grasses (1000 tCO2e/y)    |      |      |      |      |      |      | 0     |
| Carbon sink potential - Moderate<br>deployment - Cropland measures (1000<br>tCO2e/y)                 |      |      |      |      |      |      | -184  |
| Carbon sink potential - Moderate<br>deployment - Permanent conservation<br>cover (1000 tCO2e/y)      |      |      |      |      |      |      | -7.84 |
| Carbon sink potential - Moderate<br>deployment - Total (1000 tCO2e/y)                                |      |      |      |      |      |      | -192  |
| Carbon sink potential - Aggressive<br>deployment - Corn-ethanol to energy<br>grasses (1000 tCO2e/y)  |      |      |      |      |      |      | 0     |
| Carbon sink potential - Aggressive<br>deployment - Cropland measures (1000<br>tCO2e/y)               |      |      |      |      |      |      | -360  |
| Carbon sink potential - Aggressive<br>deployment - Permanent conservation<br>cover (1000 tCO2e/y)    |      |      |      |      |      |      | -15.7 |
| Carbon sink potential - Aggressive deployment - Total (1000 tC02e/y)                                 |      |      |      |      |      |      | -376  |
| Land impacted for carbon sink - Moderate deployment - Corn-ethanol to energy grasses (1000 hectares) |      |      |      |      |      |      | 0     |
| Land impacted for carbon sink - Moderate<br>deployment - Cropland measures (1000<br>hectares)        |      |      |      |      |      |      | 329   |
| Land impacted for carbon sink - Moderate deployment - Permanent conservation cover (1000 hectares)   |      |      |      |      |      |      | 12.1  |
| Land impacted for carbon sink - Moderate deployment - Total (1000 hectares)                          |      |      |      |      |      |      | 341   |

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

| Item                                    | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|------|------|------|------|------|------|------|
| Land impacted for carbon sink -         |      |      |      |      |      |      | 0    |
| Aggressive deployment - Corn-ethanol to |      |      |      |      |      |      |      |
| energy grasses (1000 hectares)          |      |      |      |      |      |      |      |
| Land impacted for carbon sink -         |      |      |      |      |      |      | 646  |
| Aggressive deployment - Cropland        |      |      |      |      |      |      |      |
| measures (1000 hectares)                |      |      |      |      |      |      |      |
| Land impacted for carbon sink -         |      |      |      |      |      |      | 24.1 |
| Aggressive deployment - Permanent       |      |      |      |      |      |      |      |
| conservation cover (1000 hectares)      |      |      |      |      |      |      |      |
| Land impacted for carbon sink -         |      |      |      |      |      |      | 670  |
| Aggressive deployment - Total (1000     |      |      |      |      |      |      |      |
| hectares)                               |      |      |      |      |      |      |      |

| 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)                      |      | 17.8  | 0.021 | 0.021 | 0.018 | 0.012 | 0     |
| Premature deaths from air pollution -<br>Fuel Comb - Electric Generation - Natural<br>Gas (deaths)         |      | 4.53  | 2.69  | 1.98  | 1.59  | 1     | 0.951 |
| Premature deaths from air pollution -<br>Mobile - On-Road (deaths)   |      | 85.1  | 89.6  | 90.6  | 84.5  | 69.4  | 49.1  |
| Premature deaths from air pollution - Gas<br>Stations (deaths)   |      | 4.01  | 4.21  | 4.23  | 3.95  | 3.28  | 2.4   |
| Premature deaths from air pollution -<br>Fuel Comb - Residential - Natural Gas<br>(deaths)                 |      | 16.7  | 16.8  | 16.6  | 15.4  | 12.8  | 9.15  |
| Premature deaths from air pollution -<br>Fuel Comb - Residential - Oil (deaths)                            |      | 0.078 | 0.076 | 0.071 | 0.063 | 0.054 | 0.045 |
| Premature deaths from air pollution -<br>Fuel Comb - Residential - Other (deaths)                          |      | 0.631 | 0.673 | 0.711 | 0.702 | 0.611 | 0.48  |
| Premature deaths from air pollution -<br>Fuel Comb - Comm/Institutional - Coal<br>(deaths)                 |      | 0.053 | 0.053 | 0.052 | 0.051 | 0.05  | 0.048 |
| Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Natural Gas (deaths)                |      | 5.21  | 5.24  | 5.16  | 4.79  | 4.06  | 3.09  |
| Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Oil (deaths)                        |      | 0.423 | 0.377 | 0.337 | 0.299 | 0.261 | 0.224 |
| Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Other (deaths)                      |      | 0.842 | 0.787 | 0.727 | 0.66  | 0.588 | 0.516 |
| Premature deaths from air pollution -<br>Industrial Processes - Coal Mining<br>(deaths)                    |      | 0.187 | 0.026 | 0.026 | 0.025 | 0.024 | 0.022 |
| Premature deaths from air pollution -<br>Industrial Processes - Oil & Gas<br>Production (deaths)           |      | 21.4  | 19.9  | 17.7  | 15.9  | 14.3  | 10.3  |
| Monetary damages from air pollution -<br>Fuel Comb - Electric Generation - Coal<br>(million \$2019)        |      | 158   | 0.183 | 0.183 | 0.163 | 0.107 | 0     |
| Monetary damages from air pollution -<br>Fuel Comb - Electric Generation - Natural<br>Gas (million \$2019) |      | 40.1  | 23.8  | 17.5  | 14.1  | 8.86  | 8.42  |
| Monetary damages from air pollution -<br>Mobile - On-Road (million \$2019)                                 |      | 757   | 796   | 806   | 751   | 617   | 436   |
| Monetary damages from air pollution -<br>Gas Stations (million \$2019)                                     |      | 35.5  | 37.3  | 37.5  | 34.9  | 29    | 21.3  |

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

| Item  | 2020 | 2025  | 2030  | 2035  | 2040  | 2045  | 2050  |
|---|------|-------|-------|-------|-------|-------|-------|
| Monetary damages from air pollution -<br>Fuel Comb - Residential - Natural Gas<br>(million \$2019)        |      | 148   | 149   | 147   | 137   | 113   | 81.1  |
| Monetary damages from air pollution -<br>Fuel Comb - Residential - Oil (million<br>\$2019)                |      | 0.691 | 0.676 | 0.629 | 0.555 | 0.48  | 0.402 |
| Monetary damages from air pollution -<br>Fuel Comb - Residential - Other (million<br>\$2019)              |      | 5.59  | 5.96  | 6.3   | 6.22  | 5.41  | 4.25  |
| Monetary damages from air pollution -<br>Fuel Comb - Comm/Institutional - Coal<br>(million \$2019)        |      | 0.473 | 0.47  | 0.463 | 0.453 | 0.439 | 0.422 |
| Monetary damages from air pollution -<br>Fuel Comb - Comm/Institutional - Natural<br>Gas (million \$2019) |      | 46.1  | 46.4  | 45.6  | 42.4  | 35.9  | 27.4  |
| Monetary damages from air pollution -<br>Fuel Comb - Comm/Institutional - Oil<br>(million \$2019)         |      | 3.75  | 3.34  | 2.99  | 2.64  | 2.31  | 1.98  |
| Monetary damages from air pollution -<br>Fuel Comb - Comm/Institutional - Other<br>(million \$2019)       |      | 7.46  | 6.96  | 6.43  | 5.84  | 5.21  | 4.56  |
| Monetary damages from air pollution -<br>Industrial Processes - Coal Mining<br>(million \$2019)           |      | 1.65  | 0.228 | 0.228 | 0.221 | 0.21  | 0.196 |
| Monetary damages from air pollution -<br>Industrial Processes - Oil & Gas<br>Production (million \$2019)  |      | 190   | 177   | 157   | 141   | 127   | 91    |

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

| By economic sector - Construction (jobs)   4,748   6,728   5,694   5,098   5,338   6,838   | Item  | 2020 | 2025  | 2030   | 2035   | 2040  | 2045  | 2050   |
|--|---|------|-------|--------|--------|-------|-------|--------|
| By economic sector - Manufacturing (jobs)   3,843   5,127   4,339   3,445   3,570   3,890 (jobs)   By economic sector - Mining (jobs)   4,891   3,407   2,581   1,959   1,454   865   By economic sector - Other (jobs)   470   640   6629   658   760   1,366   By economic sector - Pipeline (jobs)   399   348   302   267   224   155   By economic sector - Professional (jobs)   2,733   3,440   2,934   2,731   2,939   3,834   By economic sector - Trade (jobs)   2,767   2,768   2,423   2,222   2,244   2,763   By economic sector - Utilities (jobs)   3,872   6,954   4,905   3,957   4,300   4,765   By resource sector - Biomass (jobs)   18.6   17.7   8.3   7.61   6.97   6.28   By resource sector - CO2 (jobs)   0   0   0   0   0   0   0   51.8   By resource sector - CO2 (jobs)   2,667   1,041   532   465   418   369   By resource sector - Grid (jobs)   4,640   12,081   8,577   6,510   7,295   8,514   By resource sector - Natural Gas (jobs)   4,790   3,776   2,791   2,413   2,018   1,403   By resource sector - Natural Gas (jobs)   4,790   3,776   2,791   2,413   2,018   1,403   By resource sector - Oil (jobs)   6,829   6,068   5,411   4,764   4,011   2,433   By resource sector - Solar (jobs)   3,430   3,435   3,688   3,806   4,202   7,982   By resource sector - Wind (jobs)   1,356   3,000   2,802   2,372   2,880   3,715   By education level - All sectors - High   9,939   12,365   10,043   8,560   8,762   10,286   By education level - All sectors - Figh   5,220   6,203   5,020   4,288   4,334   4,968   By education level - All sectors - Solar (jobs)   By education level - All sectors - Bachelors degree (jobs)   By education level - All sectors - Masters   1,239   1,483   1,198   1,033   1,052   1,230   1,230   1,230   1,483   1,198   1,033   1,052   1,230   1,230   1,230   1,230   1,483   1,198   1,033   1,052   1,230 |   |      | 4.69  | 6.56   | 2.45   |       | - 1   | 1.33   |
| By economic sector - Mining (jobs)   | By economic sector - Construction (jobs)    |      | 4,748 | 6,728  | 5,694  | 5,098 | 5,338 | 6,838  |
| By economic sector - Mining (jobs)   4,891   3,407   2,581   1,959   1,454   862   | By economic sector - Manufacturing          |      | 3,843 | 5,127  | 4,339  | 3,445 | 3,570 | 3,890  |
| By economic sector - Other (jobs)   470   640   629   658   760   1,36   | (jobs)                                      |      |       |        |        |       |       |        |
| By economic sector - Pipeline (jobs)   399   348   302   267   224   159   | ,   |      | 4,891 | 3,407  | 2,581  | 1,959 | 1,454 | 862    |
| By economic sector - Professional (jobs)   2,733   3,440   2,934   2,731   2,939   3,834   | By economic sector - Other (jobs)           |      | 470   | 640    | 629    | 658   | 760   | 1,367  |
| By economic sector - Trade (jobs)   2,767   2,768   2,423   2,222   2,244   2,765   2,765   2,768   2,423   2,222   2,244   2,765  | By economic sector - Pipeline (jobs)        |      | 399   | 348    | 302    | 267   | 224   | 159    |
| By economic sector - Utilities (jobs) 3,872 6,954 4,905 3,957 4,300 4,763 By resource sector - Biomass (jobs) 18.6 17.7 8.3 7.61 6.97 6.28 By resource sector - CO2 (jobs) 0 0 0 0 0 0 0 51.8 By resource sector - CO2 (jobs) 2,667 1,041 532 465 418 369 By resource sector - Grid (jobs) 4,640 12,081 8,577 6,510 7,295 8,514 By resource sector - Natural Gas (jobs) 4,790 3,776 2,791 2,413 2,018 1,403 By resource sector - Nuclear (jobs) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0  | By economic sector - Professional (jobs)    |      | 2,733 | 3,440  | 2,934  | 2,731 | 2,939 | 3,834  |
| By resource sector - Biomass (jobs)   18.6   17.7   8.3   7.61   6.97   6.26   | By economic sector - Trade (jobs)           |      | 2,767 | 2,768  | 2,423  | 2,222 | 2,244 | 2,763  |
| By resource sector - CO2 (jobs)         0         0         0         0         0         51.8           By resource sector - Coal (jobs)         2,667         1,041         532         465         418         369           By resource sector - Grid (jobs)         4,640         12,081         8,577         6,510         7,295         8,514           By resource sector - Natural Gas (jobs)         4,790         3,776         2,791         2,413         2,018         1,403           By resource sector - Nuclear (jobs)         0 <td>By economic sector - Utilities (jobs)</td> <td></td> <td>3,872</td> <td>6,954</td> <td>4,905</td> <td>3,957</td> <td>4,300</td> <td>4,763</td>   | By economic sector - Utilities (jobs)       |      | 3,872 | 6,954  | 4,905  | 3,957 | 4,300 | 4,763  |
| By resource sector - Coal (jobs)         2,667         1,041         532         465         418         369           By resource sector - Grid (jobs)         4,640         12,081         8,577         6,510         7,295         8,514           By resource sector - Natural Gas (jobs)         4,790         3,776         2,791         2,413         2,018         1,403           By resource sector - Nuclear (jobs)         0   |   |      | 18.6  | 17.7   | 8.3    | 7.61  | 6.97  | 6.28   |
| By resource sector - Grid (jobs)   | By resource sector - CO2 (jobs)             |      | 0     | 0      | 0      | 0     | 0     | 51.8   |
| By resource sector - Natural Gas (jobs)         4,790         3,776         2,791         2,413         2,018         1,403           By resource sector - Nuclear (jobs)         0  | By resource sector - Coal (jobs)            |      | 2,667 | 1,041  | 532    | 465   | 418   | 369    |
| By resource sector - Nuclear (jobs)         0  | By resource sector - Grid (jobs)            |      | 4,640 | 12,081 | 8,577  | 6,510 | 7,295 | 8,514  |
| By resource sector - Oil (jobs)   6,829   6,068   5,411   4,764   4,011   2,432  | By resource sector - Natural Gas (jobs)     |      | 4,790 | 3,776  | 2,791  | 2,413 | 2,018 | 1,403  |
| By resource sector - Solar (jobs)         3,430         3,435         3,688         3,806         4,202         7,982           By resource sector - Wind (jobs)         1,356         3,000         2,802         2,372         2,880         3,719           By education level - All sectors - High school diploma or less (jobs)         9,939         12,365         10,043         8,560         8,762         10,286           By education level - All sectors - Associates degree or some college (jobs)         7,157         9,167         7,380         6,309         6,531         7,808           By education level - All sectors - Bachelors degree (jobs)         5,220         6,203         5,020         4,288         4,334         4,968           By education level - All sectors - Masters or professional degree (jobs)         1,239         1,483         1,198         1,033         1,052         1,23   | By resource sector - Nuclear (jobs)         |      | 0     | 0      | 0      | 0     | 0     | 0      |
| By resource sector - Wind (jobs)         1,356         3,000         2,802         2,372         2,880         3,719           By education level - All sectors - High school diploma or less (jobs)         9,939         12,365         10,043         8,560         8,762         10,286           By education level - All sectors - Associates degree or some college (jobs)         7,157         9,167         7,380         6,309         6,531         7,808           By education level - All sectors - Bachelors degree (jobs)         5,220         6,203         5,020         4,288         4,334         4,968           By education level - All sectors - Masters or professional degree (jobs)         1,239         1,483         1,198         1,033         1,052         1,23   | By resource sector - Oil (jobs)             |      | 6,829 | 6,068  | 5,411  | 4,764 | 4,011 | 2,432  |
| By education level - All sectors - High school diploma or less (jobs)       9,939       12,365       10,043       8,560       8,762       10,286         By education level - All sectors - Associates degree or some college (jobs)       7,157       9,167       7,380       6,309       6,531       7,808         By education level - All sectors - Bachelors degree (jobs)       5,220       6,203       5,020       4,288       4,334       4,968         By education level - All sectors - Masters or professional degree (jobs)       1,239       1,483       1,198       1,033       1,052       1,23  | By resource sector - Solar (jobs)           |      | 3,430 | 3,435  | 3,688  | 3,806 | 4,202 | 7,982  |
| school diploma or less (jobs)       7,157       9,167       7,380       6,309       6,531       7,808         Associates degree or some college (jobs)       5,220       6,203       5,020       4,288       4,334       4,968         Bachelors degree (jobs)       5,220       1,239       1,483       1,198       1,033       1,052       1,23         or professional degree (jobs)       1,239       1,483       1,198       1,033       1,052       1,23   | By resource sector - Wind (jobs)            |      | 1,356 | 3,000  | 2,802  | 2,372 | 2,880 | 3,719  |
| By education level - All sectors - Associates degree or some college (jobs)       7,157       9,167       7,380       6,309       6,531       7,808         By education level - All sectors - Bachelors degree (jobs)       5,220       6,203       5,020       4,288       4,334       4,968         By education level - All sectors - Masters or professional degree (jobs)       1,239       1,483       1,198       1,033       1,052       1,23   | By education level - All sectors - High     |      | 9,939 | 12,365 | 10,043 | 8,560 | 8,762 | 10,286 |
| Associates degree or some college (jobs)  By education level - All sectors - 5,220 6,203 5,020 4,288 4,334 4,968  Bachelors degree (jobs)  By education level - All sectors - Masters 1,239 1,483 1,198 1,033 1,052 1,23 or professional degree (jobs)   | school diploma or less (jobs)               |      |       |        |        |       |       |        |
| By education level - All sectors - Bachelors degree (jobs)       5,220       6,203       5,020       4,288       4,334       4,968         By education level - All sectors - Masters or professional degree (jobs)       1,239       1,483       1,198       1,033       1,052       1,23   | By education level - All sectors -          |      | 7,157 | 9,167  | 7,380  | 6,309 | 6,531 | 7,808  |
| Bachelors degree (jobs)  By education level - All sectors - Masters 1,239 1,483 1,198 1,033 1,052 1,23 or professional degree (jobs)   |   |      |       |        |        |       |       |        |
| By education level - All sectors - Masters 1,239 1,483 1,198 1,033 1,052 1,23 or professional degree (jobs)  |   |      | 5,220 | 6,203  | 5,020  | 4,288 | 4,334 | 4,968  |
| or professional degree (jobs)  |   |      |       |        |        |       |       |        |
|  | ,   |      | 1,239 | 1,483  | 1,198  | 1,033 | 1,052 | 1,231  |
|  |   |      |       |        |        |       |       |        |
|  | By education level - All sectors - Doctoral |      | 175   | 200    | 167    | 149   | 152   | 184    |
| degree (jobs)  | degree (jobs)                               |      |       |        |        |       |       |        |

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

| Item   | 2020 | 2025   | 2030   | 2035   | 2040   | 2045   | 2050   |
|--|------|--------|--------|--------|--------|--------|--------|
| Related work experience - All sectors -<br>None (jobs)               |      | 3,334  | 4,206  | 3,397  | 2,907  | 2,988  | 3,532  |
| Related work experience - All sectors - Up to 1 year (jobs)          |      | 4,642  | 5,747  | 4,689  | 4,006  | 4,118  | 4,928  |
| Related work experience - All sectors - 1 to 4 years (jobs)          |      | 8,740  | 10,724 | 8,674  | 7,413  | 7,570  | 8,826  |
| Related work experience - All sectors - 4 to 10 years (jobs)         |      | 5,510  | 6,876  | 5,545  | 4,739  | 4,856  | 5,688  |
| Related work experience - All sectors -<br>Over 10 years (jobs)      |      | 1,505  | 1,865  | 1,503  | 1,272  | 1,298  | 1,502  |
| On-the-Job Training - All sectors - None<br>(jobs)                   |      | 1,304  | 1,567  | 1,279  | 1,100  | 1,120  | 1,336  |
| On-the-Job Training - All sectors - Up to 1 year (jobs)              |      | 15,928 | 19,510 | 15,822 | 13,490 | 13,780 | 16,090 |
| On-the-Job Training - All sectors - 1 to 4 years (jobs)              |      | 4,843  | 6,175  | 4,963  | 4,239  | 4,366  | 5,161  |
| On-the-Job Training - All sectors - 4 to 10 years (jobs)             |      | 1,430  | 1,888  | 1,515  | 1,313  | 1,366  | 1,652  |
| On-the-Job Training - All sectors - Over 10 years (jobs)             |      | 226    | 278    | 229    | 195    | 199    | 237    |
| On-Site or In-Plant Training - All sectors -<br>None (jobs)          |      | 3,774  | 4,665  | 3,790  | 3,247  | 3,333  | 3,973  |
| On-Site or In-Plant Training - All sectors -<br>Up to 1 year (jobs)  |      | 14,469 | 17,738 | 14,373 | 12,252 | 12,514 | 14,607 |
| On-Site or In-Plant Training - All sectors -<br>1 to 4 years (jobs)  |      | 3,793  | 4,811  | 3,875  | 3,308  | 3,402  | 4,011  |
| On-Site or In-Plant Training - All sectors -<br>4 to 10 years (jobs) |      | 1,511  | 1,957  | 1,572  | 1,360  | 1,404  | 1,672  |
| On-Site or In-Plant Training - All sectors -<br>Over 10 years (jobs) |      | 183    | 247    | 198    | 170    | 178    | 213    |
| Wage income - All (million \$2019)                                   |      | 1,284  | 1,597  | 1,300  | 1,122  | 1,156  | 1,351  |

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

| Item                                   | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|------|------|------|------|------|------|------|
| Final energy use - Transportation (PJ) | 304  | 292  | 270  | 253  | 241  | 225  | 207  |
| Final energy use - Residential (PJ)    | 126  | 122  | 121  | 118  | 114  | 105  | 94.6 |
| Final energy use - Commercial (PJ)     | 103  | 103  | 103  | 102  | 99.5 | 96.4 | 92.8 |
| Final energy use - Industry (PJ)       | 86.5 | 89.4 | 90.4 | 97.9 | 112  | 117  | 124  |

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

| •••   | •    | •    | •    |      |      |      |      |
|---|------|------|------|------|------|------|------|
| Item  | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
| Electricity distribution capital invested - |      | 1.43 | 1.48 | 1.97 | 2.07 | 2.75 | 2.92 |
| Cumulative 5-yr (billion \$2018)            |      |      |      |      |      |      |      |

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

| Item   | 2020  | 2025  | 2030  | 2035  | 2040  | 2045  | 2050  |
|--|-------|-------|-------|-------|-------|-------|-------|
| Vehicle stocks - LDV – EV (1000 units)   | 37.7  | 93.7  | 150   | 410   | 669   | 1,244 | 1,819 |
| Vehicle stocks - LDV – All others (1000 units)                                 | 2,378 | 2,378 | 2,378 | 2,256 | 2,134 | 1,644 | 1,155 |
| Light-duty vehicle capital costs vs. REF -<br>Cumulative 5-yr (million \$2018) |       | 0     | 76.1  | 152   | 522   | 1,618 | 2,366 |
| Public EV charging plugs - DC Fast (1000 units)                                | 0.174 |       | 0.26  |       | 1.16  |       | 3.16  |
| Public EV charging plugs - L2 (1000 units)                                     | 1.07  |       | 6.25  |       | 27.9  |       | 75.9  |

| Table Ely E Dy acongnia   | DTIIAD 1. | Efficiency/Flectrification - | Dooidontial |
|---------------------------|-----------|------------------------------|-------------|
| Tanie 54' F-R+ scenario - | PILLARI   | -Miciency/Fiectrification -  | KESIAENTIAI |

| Item                                       | 2020  | 2025  | 2030  | 2035  | 2040  | 2045  | 2050  |
|--|-------|-------|-------|-------|-------|-------|-------|
| Sales of space heating units - Electric    | 3.03  | 8.14  | 10.8  | 19.7  | 39.7  | 63.6  | 77.1  |
| Heat Pump (%)                              |       |       |       |       |       |       |       |
| Sales of space heating units - Electric    | 3.81  | 7.45  | 7.24  | 6.69  | 5.41  | 3.74  | 2.75  |
| Resistance (%)                             |       |       |       |       |       |       |       |
| Sales of space heating units - Gas (%)     | 89.6  | 75.1  | 72.6  | 64.6  | 46.5  | 25    | 12.6  |
| Sales of space heating units - Fossil (%)  | 3.57  | 9.27  | 9.34  | 9.11  | 8.39  | 7.66  | 7.61  |
| Sales of water heating units - Electric    | 0     | 0.562 | 2.11  | 7.14  | 18.6  | 32.3  | 40.2  |
| Heat Pump (%)                              |       |       |       |       |       |       |       |
| Sales of water heating units - Electric    | 7.01  | 15.2  | 16.4  | 20.2  | 29.3  | 40.6  | 47.3  |
| Resistance (%)                             |       |       |       |       |       |       |       |
| Sales of water heating units - Gas Furnace | 92.3  | 83.4  | 80.7  | 71.9  | 51.3  | 26.3  | 11.8  |
| (%)  |       |       |       |       |       |       |       |
| Sales of water heating units - Other (%)   | 0.642 | 0.79  | 0.789 | 0.787 | 0.783 | 0.781 | 0.778 |
| Sales of cooking units - Electric          | 36.9  | 38.5  | 44.3  | 59.5  | 80.7  | 93.8  | 98.3  |
| Resistance (%)                             |       |       |       |       |       |       |       |
| Sales of cooking units - Gas (%)           | 63.1  | 61.5  | 55.7  | 40.5  | 19.3  | 6.23  | 1.68  |
| Residential HVAC investment in 2020s vs.   |       | 2.75  | 3.16  |       |       |       |       |
| REF - Cumulative 5-yr (billion \$2018)     |       |       |       |       |       |       |       |

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

| Item                                      | 2020  | 2025  | 2030  | 2035  | 2040  | 2045  | 2050  |
|---|-------|-------|-------|-------|-------|-------|-------|
| Sales of space heating units - Electric   | 0.749 | 7.59  | 10.3  | 19    | 39.5  | 64.5  | 79    |
| Heat Pump (%)                             |       |       |       |       |       |       |       |
| Sales of space heating units - Electric   | 0.855 | 3.35  | 3.5   | 4.01  | 5.26  | 6.85  | 7.79  |
| Resistance (%)                            |       |       |       |       |       |       |       |
| Sales of space heating units - Gas (%)    | 98.4  | 88.8  | 86    | 76.8  | 55.2  | 28.6  | 13.2  |
| Sales of space heating units - Fossil (%) | 0     | 0.241 | 0.225 | 0.172 | 0.092 | 0.04  | 0.021 |
| Sales of water heating units - Electric   | 0.008 | 0.63  | 2.29  | 7.68  | 20    | 34.8  | 43.4  |
| Heat Pump (%)                             |       |       |       |       |       |       |       |
| Sales of water heating units - Electric   | 0.41  | 2     | 3.48  | 8.38  | 19.9  | 34.2  | 42.5  |
| Resistance (%)                            |       |       |       |       |       |       |       |
| Sales of water heating units - Gas (%)    | 99.5  | 97    | 93.8  | 83.6  | 59.7  | 30.6  | 13.7  |
| Sales of water heating units - Other (%)  | 0.1   | 0.381 | 0.381 | 0.382 | 0.381 | 0.381 | 0.381 |
| Sales of cooking units - Electric         | 41.9  | 46.2  | 50.2  | 60.8  | 75.4  | 84.6  | 87.8  |
| Resistance (%)                            |       |       |       |       |       |       |       |
| Sales of cooking units - Gas (%)          | 58.1  | 53.8  | 49.8  | 39.2  | 24.6  | 15.4  | 12.2  |
| Commercial HVAC investment in 2020s -     |       | 7,532 | 8,365 |       |       |       |       |
| Cumulative 5-yr (million \$2018)          |       |       |       |       |       |       |       |

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

| Item  | 2020  | 2025  | 2030  | 2035  | 2040  | 2045  | 2050  |
|---|-------|-------|-------|-------|-------|-------|-------|
| Installed thermal - Coal (MW)                                       | 4,894 | 3,250 | 0     | 0     | 0     | 0     | 0     |
| Installed thermal - Natural gas (MW)                                | 2,926 | 2,930 | 3,381 | 3,375 | 3,378 | 2,661 | 3,645 |
| Installed thermal - Nuclear (MW)                                    | 0     | 0     | 0     | 0     | 0     | 0     | 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     | 0     |
| Capital invested - Biomass w/ccu power plant (billion \$2018)       | 0     | 0     | 0     | 0     | 0     | 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    | 0    | 0    | 0    |
| Biomass w/ccu allam power plant (GWh) | 0    | 0    | 0    | 0    | 0    | 0    | 0    |

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             | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| (quantity)                                   |      |      |      |      |      |      |      |
| Number of facilities - Allam power w ccu     | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| (quantity)                                   |      |      |      |      |      |      |      |
| Number of facilities - Beccs hydrogen        | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| (quantity)                                   |      |      |      |      |      |      |      |
| Number of facilities - Diesel (quantity)     | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Number of facilities - Diesel ccu (quantity) | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Number of facilities - Pyrolysis (quantity)  | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Number of facilities - Pyrolysis ccu         | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| (quantity)                                   |      |      |      |      |      |      |      |
| 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 -              |      | 0    | 0    | 0    | 0    | 0    | 0    |
| Cumulative 5-yr (million \$2018)             |      |      |      |      |      |      |      |
| Biomass purchases (million \$2018/y)         |      | 0    | 0    | 0    | 0    | 0    | 0    |

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

| Item                               | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|------------------------------------|------|------|------|------|------|------|------|
| Annual - All (MMT)                 |      | 0    | 0    | 0    | 0    | 0    | 0    |
| Annual - BECCS (MMT)               |      | 0    | 0    | 0    | 0    | 0    | 0    |
| Annual - NGCC (MMT)                |      | 0    | 0    | 0    | 0    | 0    | 0    |
| Annual - Cement and lime (MMT)     |      | 0    | 0    | 0    | 0    | 0    | 0    |
| Cumulative - All (MMT)             |      | 0    | 0    | 0    | 0    | 0    | 0    |
| Cumulative - BECCS (MMT)           |      | 0    | 0    | 0    | 0    | 0    | 0    |
| Cumulative - NGCC (MMT)            |      | 0    | 0    | 0    | 0    | 0    | 0    |
| Cumulative - Cement and lime (MMT) |      | 0    | 0    | 0    | 0    | 0    | 0    |

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

| Item   | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|------|------|------|------|------|------|------|
| Trunk (km)                                     |      | 0    | 0    | 0    | 0    | 0    | 0    |
| Spur (km)                                      |      | 0    | 0    | 0    | 0    | 0    | 0    |
| All (km)                                       |      | 0    | 0    | 0    | 0    | 0    | 0    |
| Cumulative investment - Trunk (million \$2018) |      | 0    | 0    | 0    | 0    | 0    | 0    |
| Cumulative investment - Spur (million \$2018)  |      | 0    | 0    | 0    | 0    | 0    | 0    |
| Cumulative investment - All (million \$2018)   |      | 0    | 0    | 0    | 0    | 0    | 0    |

### 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    | 0    | 0    |
| Resource characterization, appraisal, permitting costs (million \$2020) |      | 0    | 0    | 0    | 0    | 0    | 0    |
| Wells and facilities construction costs (million \$2020)                |      | 0    | 0    | 0    | 0    | 0    | 0    |

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

| Item 2020 2025 2030                       | 0005 0077 |         |
|---|-----------|---------|
|   | 2035 2040 | -       |
| Carbon sink potential - Low - Accelerate  |           | -707    |
| regeneration (1000 tCO2e/y)               |           |         |
| Carbon sink potential - Low - Avoid       |           | -140    |
| deforestation (1000 tCO2e/y)              |           |         |
| Carbon sink potential - Low - Extend      |           | -2,919  |
| rotation length (1000 tCO2e/y)            |           |         |
| Carbon sink potential - Low - Improve     |           | -5.38   |
| plantations (1000 tCO2e/y)                |           |         |
| Carbon sink potential - Low - Increase    |           | -9.92   |
| retention of HWP (1000 tCO2e/y)           |           |         |
| Carbon sink potential - Low - Increase    |           | -116    |
| trees outside forests (1000 tCO2e/y)      |           |         |
| Carbon sink potential - Low - Reforest    |           | -1,189  |
| cropland (1000 tC02e/y)                   |           |         |
| Carbon sink potential - Low - Reforest    |           | -101    |
| pasture (1000 tCO2e/y)                    |           |         |
| Carbon sink potential - Low - Restore     |           | -1,568  |
| productivity (1000 tCO2e/y)               |           | .,555   |
| Carbon sink potential - Low - All (not    |           | -6,755  |
| counting overlap) (1000 tC02e/y)          |           | 0,100   |
| Carbon sink potential - Mid - Accelerate  |           | -1,060  |
| regeneration (1000 tC02e/y)               |           | -1,000  |
| Carbon sink potential - Mid - Avoid       |           | -489    |
| deforestation (1000 tC02e/y)              |           | -409    |
| Carbon sink potential - Mid - Extend      |           | -5,260  |
| · · · · · · · · · · · · · · · · · · ·     |           | -5,260  |
| rotation length (1000 tC02e/y)            |           | 700     |
| Carbon sink potential - Mid - Improve     |           | -7.89   |
| plantations (1000 tCO2e/y)                |           | 10.0    |
| Carbon sink potential - Mid - Increase    |           | -19.8   |
| retention of HWP (1000 tCO2e/y)           |           |         |
| Carbon sink potential - Mid - Increase    |           | -224    |
| trees outside forests (1000 tC02e/y)      |           |         |
| Carbon sink potential - Mid - Reforest    |           | -1,783  |
| cropland (1000 tCO2e/y)                   |           |         |
| Carbon sink potential - Mid - Reforest    |           | -715    |
| pasture (1000 tCO2e/y)                    |           |         |
| Carbon sink potential - Mid - Restore     |           | -3,109  |
| productivity (1000 tCO2e/y)               |           |         |
| Carbon sink potential - Mid - All (not    |           | -12,667 |
| counting overlap) (1000 tCO2e/y)          |           |         |
| Carbon sink potential - High - Accelerate |           | -1,412  |
| regeneration (1000 tC02e/y)               |           |         |
| Carbon sink potential - High - Avoid      |           | -838    |
| deforestation (1000 tC02e/y)              |           |         |
| Carbon sink potential - High - Extend     |           | -7,600  |
| rotation length (1000 tCO2e/y)            |           |         |
| Carbon sink potential - High - Improve    |           | -10.6   |
| plantations (1000 tCO2e/y)                |           |         |
| Carbon sink potential - High - Increase   |           | -29.8   |
| retention of HWP (1000 tC02e/y)           |           |         |
| Carbon sink potential - High - Increase   |           | -332    |
| trees outside forests (1000 tCO2e/y)      |           |         |
| Carbon sink potential - High - Reforest   |           | -2,378  |
| cropland (1000 tCO2e/y)                   |           | 2,010   |
| Carbon sink potential - High - Reforest   |           | -1,329  |
| pasture (1000 tC02e/y)                    |           | -1,329  |
|   |           | -18,580 |
| Carbon sink potential - High - All (not   |           | -18,580 |
| counting overlap) (1000 tC02e/y)          |           | 1 / 54  |
| Carbon sink potential - High - Restore    |           | -4,651  |
| productivity (1000 tCO2e/y)               |           |         |

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 -<br>Low - Accelerate regeneration (1000 |      |      |      |      |      |      | 116   |
| hectares)  Land impacted for carbon sink potential -                             |      |      |      |      |      |      | 106   |
| Low - Avoid deforestation (over 30 years)  |      |      |      |      |      |      | 100   |
| (1000 hectares)  |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 1,485 |
| Low - Extend rotation length (1000   |      |      |      |      |      |      | ,     |
| hectares)  |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 1.95  |
| Low - Improve plantations (1000  |      |      |      |      |      |      |       |
| hectares)  |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 0     |
| Low - Increase retention of HWP (1000  |      |      |      |      |      |      |       |
| hectares)  Land impacted for carbon sink potential -                             |      |      |      |      |      |      | 16.6  |
| Low - Increase trees outside forests   |      |      |      |      |      |      | 10.0  |
| (1000 hectares)  |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 78.6  |
| Low - Reforest cropland (1000 hectares)  |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 6.55  |
| Low - Reforest pasture (1000 hectares)   |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 933   |
| Low - Restore productivity (1000   |      |      |      |      |      |      |       |
| hectares)  |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 2,743 |
| Low - Total impacted (over 30 years)   |      |      |      |      |      |      |       |
| (1000 hectares)  Land impacted for carbon sink potential -                       |      |      |      |      |      |      | 173   |
| Mid - Accelerate regeneration (1000  |      |      |      |      |      |      | 113   |
| hectares)  |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 110   |
| Mid - Avoid deforestation (over 30 years)  |      |      |      |      |      |      |       |
| (1000 hectares)  |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 2,680 |
| Mid - Extend rotation length (1000   |      |      |      |      |      |      |       |
| hectares)  |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 2.93  |
| Mid - Improve plantations (1000 hectares)  |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 0     |
| Mid - Increase retention of HWP (1000 hectares)                                  |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 24.1  |
| Mid - Increase trees outside forests (1000                                       |      |      |      |      |      |      | 24.1  |
| hectares)  |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 118   |
| Mid - Reforest cropland (1000 hectares)  |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 47.3  |
| Mid - Reforest pasture (1000 hectares)   |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 1,879 |
| Mid - Restore productivity (1000   |      |      |      |      |      |      |       |
| hectares)  |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 5,034 |
| Mid - Total impacted (over 30 years) (1000                                       |      |      |      |      |      |      |       |
| hectares)  Land impacted for carbon sink potential -                             |      |      |      |      |      |      | 231   |
| High - Accelerate regeneration (1000   |      |      |      |      |      |      | 231   |
| hectares)  |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 113   |
| High - Avoid deforestation (over 30 years)                                       |      |      |      |      |      |      |       |
| (1000 hectares)  |      |      |      |      |      |      |       |

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 - |      |      |      |      |      |      | 3,876 |
| High - Extend rotation length (1000       |      |      |      |      |      |      |       |
| hectares)                                 |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential - |      |      |      |      |      |      | 3.9   |
| High - Improve plantations (1000          |      |      |      |      |      |      |       |
| hectares)                                 |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential - |      |      |      |      |      |      | 0     |
| High - Increase retention of HWP (1000    |      |      |      |      |      |      |       |
| hectares)                                 |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential - |      |      |      |      |      |      | 31.5  |
| High - Increase trees outside forests     |      |      |      |      |      |      |       |
| (1000 hectares)                           |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential - |      |      |      |      |      |      | 157   |
| High - Reforest cropland (1000 hectares)  |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential - |      |      |      |      |      |      | 37.8  |
| High - Reforest pasture (1000 hectares)   |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential - |      |      |      |      |      |      | 1,542 |
| High - Restore productivity (1000         |      |      |      |      |      |      |       |
| hectares)                                 |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential - |      |      |      |      |      |      | 5,992 |
| High - Total impacted (over 30 years)     |      |      |      |      |      |      |       |
| (1000 hectares)                           |      |      |      |      |      |      |       |

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

| 2020 | 2025 | 2030      | 2035           | 2040                | 2045                     | 2050                          |
|------|------|-----------|----------------|---------------------|--------------------------|-------------------------------|
|      |      |           |                |                     |                          | 0                             |
|      |      |           |                |                     |                          |                               |
|      |      |           |                |                     |                          |                               |
|      |      |           |                |                     |                          | -184                          |
|      |      |           |                |                     |                          |                               |
|      |      |           |                |                     |                          |                               |
|      |      |           |                |                     |                          | -7.84                         |
|      |      |           |                |                     |                          |                               |
|      |      |           |                |                     |                          |                               |
|      |      |           |                |                     |                          | 0                             |
|      |      |           |                |                     |                          |                               |
|      |      |           |                |                     |                          |                               |
|      |      |           |                |                     |                          | 0                             |
|      |      |           |                |                     |                          |                               |
|      |      |           |                |                     |                          |                               |
|      |      |           |                |                     |                          | -192                          |
|      |      |           |                |                     |                          |                               |
|      |      |           |                |                     |                          | 0                             |
|      |      |           |                |                     |                          |                               |
|      |      |           |                |                     |                          |                               |
|      |      |           |                |                     |                          | -360                          |
|      |      |           |                |                     |                          |                               |
|      |      |           |                |                     |                          |                               |
|      |      |           |                |                     |                          | -15.7                         |
|      |      |           |                |                     |                          |                               |
|      |      |           |                |                     |                          |                               |
|      |      |           |                |                     |                          | 0                             |
|      |      |           |                |                     |                          | _                             |
|      |      |           |                |                     |                          |                               |
|      |      |           |                |                     |                          | 0                             |
|      |      |           |                |                     |                          | · ·                           |
|      |      |           |                |                     |                          |                               |
|      |      |           |                |                     |                          | -376                          |
|      |      |           |                |                     |                          | 510                           |
|      | 2020 | 2020 2025 | 2020 2025 2030 | 2020 2025 2030 2035 | 2020 2025 2030 2035 2040 | 2020 2025 2030 2035 2040 2045 |

| Item                                      | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050  |
|---|------|------|------|------|------|------|-------|
| Land impacted for carbon sink - Moderate  |      |      |      |      |      |      | 0     |
| deployment - Corn-ethanol to energy       |      |      |      |      |      |      |       |
| grasses (1000 hectares)                   |      |      |      |      |      |      |       |
| Land impacted for carbon sink - Moderate  |      |      |      |      |      |      | 329   |
| deployment - Cropland measures (1000      |      |      |      |      |      |      |       |
| hectares)                                 |      |      |      |      |      |      |       |
| Land impacted for carbon sink - Moderate  |      |      |      |      |      |      | 12.1  |
| deployment - Permanent conservation       |      |      |      |      |      |      |       |
| cover (1000 hectares)                     |      |      |      |      |      |      |       |
| Land impacted for carbon sink - Moderate  |      |      |      |      |      |      | 0.002 |
| deployment - Cropland to woody energy     |      |      |      |      |      |      |       |
| crops (1000 hectares)                     |      |      |      |      |      |      |       |
| Land impacted for carbon sink - Moderate  |      |      | +    |      |      |      | 1.05  |
| deployment - Pasture to energy crops      |      |      |      |      |      |      |       |
| (1000 hectares)                           |      |      |      |      |      |      |       |
| Land impacted for carbon sink - Moderate  |      |      |      |      |      |      | 342   |
| deployment - Total (1000 hectares)        |      |      |      |      |      |      | 0.12  |
| Land impacted for carbon sink -           |      |      |      |      |      |      | 0     |
| Aggressive deployment - Corn-ethanol to   |      |      |      |      |      |      | Ū     |
| energy grasses (1000 hectares)            |      |      |      |      |      |      |       |
| Land impacted for carbon sink -           |      |      |      |      |      |      | 1,595 |
| Aggressive deployment - Cropland          |      |      |      |      |      |      | 1,070 |
| measures (1000 hectares)                  |      |      |      |      |      |      |       |
| Land impacted for carbon sink -           |      |      |      |      |      |      | 24.1  |
| Aggressive deployment - Permanent         |      |      |      |      |      |      | 2-7.1 |
| conservation cover (1000 hectares)        |      |      |      |      |      |      |       |
| Land impacted for carbon sink -           |      |      |      |      |      |      | 0.002 |
| Aggressive deployment - Cropland to       |      |      |      |      |      |      | 0.002 |
| woody energy crops (1000 hectares)        |      |      |      |      |      |      |       |
| Land impacted for carbon sink -           |      |      |      |      |      |      | 1.05  |
| Aggressive deployment - Pasture to        |      |      |      |      |      |      | 1.00  |
| energy crops (1000 hectares)              |      |      |      |      |      |      |       |
| Land impacted for carbon sink -           |      |      |      |      |      |      | 1,620 |
| ·   |      |      |      |      |      |      | 1,020 |
| Aggressive deployment - Total (1000       |      |      |      |      |      |      |       |
| hectares)                                 |      |      |      |      |      |      |       |
|   |      |      |      |      |      |      |       |
| - 1. //                                   |      |      |      |      |      |      |       |
| Table 64: REF scenario - IMPACTS - Health |      | ·    |      |      | ·    | ,    |       |
| Item                                      | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050  |

| Item   | 2020 | 2025  | 2030  | 2035  | 2040  | 2045  | 2050  |
|--|------|-------|-------|-------|-------|-------|-------|
| Premature deaths from air pollution -<br>Fuel Comb - Electric Generation - Coal<br>(deaths)        |      | 22.9  | 17.5  | 8.4   | 6.75  | 6.34  | 5.97  |
| Premature deaths from air pollution -<br>Fuel Comb - Electric Generation - Natural<br>Gas (deaths) |      | 4.17  | 3.81  | 6.36  | 4.38  | 6.11  | 5.78  |
| Premature deaths from air pollution -<br>Mobile - On-Road (deaths)                                 |      | 85.1  | 90.8  | 96.6  | 103   | 109   | 115   |
| Premature deaths from air pollution - Gas<br>Stations (deaths)                                     |      | 4     | 4.25  | 4.49  | 4.76  | 5.03  | 5.28  |
| Premature deaths from air pollution -<br>Fuel Comb - Residential - Natural Gas<br>(deaths)         |      | 16.6  | 16.9  | 17.3  | 17.8  | 18.4  | 19.1  |
| Premature deaths from air pollution -<br>Fuel Comb - Residential - Oil (deaths)                    |      | 0.082 | 0.081 | 0.075 | 0.068 | 0.064 | 0.062 |
| Premature deaths from air pollution -<br>Fuel Comb - Residential - Other (deaths)                  |      | 0.623 | 0.676 | 0.743 | 0.81  | 0.857 | 0.9   |
| Premature deaths from air pollution -<br>Fuel Comb - Comm/Institutional - Coal<br>(deaths)         |      | 0.056 | 0.058 | 0.06  | 0.062 | 0.063 | 0.064 |

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

|  | i (continucu) |       |       |       |       |       |       |
|--|---------------|-------|-------|-------|-------|-------|-------|
| Item   | 2020          | 2025  | 2030  | 2035  | 2040  | 2045  | 2050  |
| Premature deaths from air pollution -<br>Fuel Comb - Comm/Institutional - Natural                        |               | 5.26  | 5.35  | 5.12  | 4.79  | 4.65  | 4.77  |
| Gas (deaths)   |               |       |       |       |       |       |       |
| Premature deaths from air pollution -<br>Fuel Comb - Comm/Institutional - Oil<br>(deaths)                |               | 0.442 | 0.445 | 0.455 | 0.465 | 0.476 | 0.488 |
| Premature deaths from air pollution -  |               | 0.88  | 0.933 | 0.988 | 1.04  | 1.09  | 1.14  |
| Fuel Comb - Comm/Institutional - Other (deaths)  |               | 0.00  | 0.700 | 0.700 |       |       |       |
| Premature deaths from air pollution -  |               | 0.502 | 0.337 | 0.265 | 0.253 | 0.245 | 0.23  |
| Industrial Processes - Coal Mining<br>(deaths)   |               |       |       |       |       |       |       |
| Premature deaths from air pollution -  |               | 21.5  | 23.3  | 24.5  | 24    | 24.4  | 23.3  |
| Industrial Processes - Oil & Gas<br>Production (deaths)  |               |       |       |       |       |       |       |
| Monetary damages from air pollution -  |               | 203   | 155   | 74.5  | 59.9  | 56.2  | 52.9  |
| Fuel Comb - Electric Generation - Coal<br>(million \$2019)   |               |       |       |       |       |       |       |
| Monetary damages from air pollution -  |               | 36.9  | 33.8  | 56.3  | 38.8  | 54.1  | 51.2  |
| Fuel Comb - Electric Generation - Natural<br>Gas (million \$2019)  |               |       |       |       |       |       |       |
| Monetary damages from air pollution -<br>Mobile - On-Road (million \$2019)                               |               | 757   | 808   | 859   | 914   | 969   | 1,026 |
| Monetary damages from air pollution -<br>Gas Stations (million \$2019)                                   |               | 35.4  | 37.6  | 39.8  | 42.2  | 44.5  | 46.8  |
| Monetary damages from air pollution -<br>Fuel Comb - Residential - Natural Gas<br>(million \$2019)       |               | 147   | 150   | 153   | 158   | 163   | 169   |
| Monetary damages from air pollution -<br>Fuel Comb - Residential - Oil (million<br>\$2019)               |               | 0.722 | 0.722 | 0.669 | 0.603 | 0.565 | 0.548 |
| Monetary damages from air pollution -<br>Fuel Comb - Residential - Other (million                        |               | 5.52  | 5.99  | 6.58  | 7.18  | 7.59  | 7.98  |
| \$2019)  |               | 0.404 | 0.514 | 0.500 | 0.57  | 0.57  | 0.5/0 |
| Monetary damages from air pollution -<br>Fuel Comb - Comm/Institutional - Coal<br>(million \$2019)       |               | 0.494 | 0.514 | 0.532 | 0.547 | 0.56  | 0.569 |
| Monetary damages from air pollution -  |               | 46.6  | 47.4  | 45.3  | 42.4  | 41.2  | 42.2  |
| Fuel Comb - Comm/Institutional - Natural<br>Gas (million \$2019)   |               | 10.0  |       | 10.0  | .2    | 2     | 12.2  |
| Monetary damages from air pollution -  |               | 3.91  | 3.94  | 4.03  | 4.12  | 4.22  | 4.32  |
| Fuel Comb - Comm/Institutional - Oil<br>(million \$2019)   |               |       |       |       |       |       |       |
| Monetary damages from air pollution -<br>Fuel Comb - Comm/Institutional - Other                          |               | 7.79  | 8.26  | 8.75  | 9.2   | 9.63  | 10.1  |
| (million \$2019)   |               |       |       |       |       |       |       |
| Monetary damages from air pollution -  |               | 4.43  | 2.97  | 2.33  | 2.24  | 2.17  | 2.03  |
| Industrial Processes - Coal Mining (million \$2019)  |               |       |       |       |       |       |       |
| Monetary damages from air pollution -<br>Industrial Processes - Oil & Gas<br>Production (million \$2019) |               | 191   | 207   | 217   | 213   | 217   | 207   |

Table 65: REF scenario - IMPACTS - Jobs

| Item                                     | 2020 | 2025  | 2030  | 2035  | 2040  | 2045  | 2050  |
|--|------|-------|-------|-------|-------|-------|-------|
| By economic sector - Agriculture (jobs)  |      | 4.45  | 3.98  | 3.94  | 3.21  | 3.2   | 3.47  |
| By economic sector - Construction (jobs) |      | 3,139 | 4,488 | 4,568 | 5,817 | 5,430 | 6,200 |
| By economic sector - Manufacturing       |      | 2,632 | 3,249 | 3,750 | 3,910 | 3,134 | 3,141 |
| (jobs)                                   |      |       |       |       |       |       |       |
| By economic sector - Mining (jobs)       |      | 5,534 | 4,363 | 3,505 | 2,796 | 2,330 | 1,855 |

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

| Table 65. KEF SCEITUTTO - IMPAGTS - JUDS (C  | onunueuj |        |         |        |        |        |        |
|--|----------|--------|---------|--------|--------|--------|--------|
| Item   | 2020     | 2025   | 2030    | 2035   | 2040   | 2045   | 2050   |
| By economic sector - Other (jobs)            |          | 135    | 436     | 500    | 647    | 683    | 1,134  |
| By economic sector - Pipeline (jobs)         |          | 409    | 423     | 429    | 409    | 411    | 399    |
| By economic sector - Professional (jobs)     |          | 2,271  | 2,575   | 2,473  | 2,876  | 2,714  | 3,154  |
| By economic sector - Trade (jobs)            |          | 2,601  | 2,560   | 2,341  | 2,467  | 2,352  | 2,683  |
| By economic sector - Utilities (jobs)        |          | 3,929  | 3,932   | 3,626  | 5,451  | 4,705  | 4,180  |
| By resource sector - Biomass (jobs)          |          | 17.1   | 16      | 14.9   | 13.3   | 13.6   | 13.9   |
| By resource sector - CO2 (jobs)              |          | 0      | 0       | 0      | 0      | 0      | 0      |
| By resource sector - Coal (jobs)             |          | 3,785  | 2,533   | 1,533  | 945    | 727    | 621    |
| By resource sector - Grid (jobs)             |          | 4,677  | 4,727   | 4,402  | 8,652  | 6,908  | 6,186  |
| By resource sector - Natural Gas (jobs)      |          | 4,962  | 5,100   | 5,104  | 4,747  | 4,869  | 4,280  |
| By resource sector - Nuclear (jobs)          |          | 0      | 0       | 0      | 0      | 0      | 0      |
| By resource sector - Oil (jobs)              |          | 6,856  | 6,133   | 5,554  | 5,052  | 4,669  | 4,081  |
| By resource sector - Solar (jobs)            |          |        | 2,624   | 3,194  | 3,380  | 3,533  | 6,498  |
| By resource sector - Wind (jobs)             |          | 356    | 897     | 1,393  | 1,588  | 1,043  | 1,067  |
| By education level - All sectors - High      |          | 8,651  | 9,248   | 8,916  | 10,321 | 9,202  | 9,630  |
| school diploma or less (jobs)                |          |        |         |        |        |        |        |
| By education level - All sectors -           |          | 6,129  | 6,675   | 6,476  | 7,597  | 6,790  | 7,144  |
| Associates degree or some college (jobs)     |          |        |         |        |        |        |        |
| By education level - All sectors -           |          | 4,621  | 4,800   | 4,568  | 5,077  | 4,527  | 4,669  |
| Bachelors degree (jobs)                      |          |        |         |        |        |        |        |
| By education level - All sectors - Masters   |          | 1,101  | 1,145   | 1,082  | 1,214  | 1,090  | 1,138  |
| or professional degree (jobs)                |          |        |         |        |        |        |        |
| By education level - All sectors - Doctoral  |          | 151    | 162     | 153    | 167    | 154    | 168    |
| degree (jobs)                                |          |        |         |        |        |        |        |
| Related work experience - All sectors -      |          | 2,881  | 3,110   | 3,007  | 3,503  | 3,139  | 3,295  |
| None (jobs)                                  |          |        |         |        |        |        |        |
| Related work experience - All sectors - Up   |          | 3,974  | 4,280   | 4,130  | 4,754  | 4,228  | 4,492  |
| to 1 year (jobs)                             |          |        |         |        |        |        |        |
| Related work experience - All sectors - 1    |          | 7,714  | 8,129   | 7,783  | 8,905  | 7,959  | 8,279  |
| to 4 years (jobs)                            |          |        |         |        |        |        |        |
| Related work experience - All sectors - 4    |          | 4,780  | 5,122   | 4,933  | 5,685  | 5,082  | 5,288  |
| to 10 years (jobs)                           |          |        |         |        |        |        |        |
| Related work experience - All sectors -      |          | 1,304  | 1,389   | 1,343  | 1,529  | 1,354  | 1,395  |
| Over 10 years (jobs)                         |          | 1110   | 1.10=   |        | 1.000  | 1.150  |        |
| On-the-Job Training - All sectors - None     |          | 1,113  | 1,195   | 1,146  | 1,293  | 1,158  | 1,236  |
| (jobs)                                       |          | 12.000 | 11.710  | 44.450 | 11.10= |        |        |
| On-the-Job Training - All sectors - Up to 1  |          | 13,970 | 14,742  | 14,159 | 16,135 | 14,365 | 14,978 |
| year (jobs)                                  |          | , 477  | , 507   |        | 5.407  |        |        |
| On-the-Job Training - All sectors - 1 to 4   |          | 4,177  | 4,527   | 4,373  | 5,126  | 4,585  | 4,782  |
| years (jobs)                                 |          | 1.010  | 10/0    | 1.01/  | 4.507  | 4 / 54 | 4.50/  |
| On-the-Job Training - All sectors - 4 to 10  |          | 1,213  | 1,360   | 1,314  | 1,594  | 1,451  | 1,536  |
| years (jobs)                                 |          | 100    |         | 000    | 200    |        |        |
| On-the-Job Training - All sectors - Over 10  |          | 180    | 205     | 203    | 228    | 203    | 217    |
| years (jobs)                                 |          | 0.100  | 0.470   | 0.071  | 0.007  | 0.404  | 0.700  |
| On-Site or In-Plant Training - All sectors - |          | 3,199  | 3,473   | 3,361  | 3,837  | 3,426  | 3,629  |
| None (jobs)                                  |          | 10.707 | 10 / 07 | 10.070 | 1/ /05 | 10.077 | 10 (00 |
| On-Site or In-Plant Training - All sectors - |          | 12,724 | 13,407  | 12,863 | 14,685 | 13,077 | 13,622 |
| Up to 1 year (jobs)                          |          | 0.000  | 0.5/0   | 0.400  | 0.007  | 0.570  | 0.707  |
| On-Site or In-Plant Training - All sectors - |          | 3,280  | 3,542   | 3,420  | 3,996  | 3,572  | 3,726  |
| 1 to 4 years (jobs)                          |          | 1.007  | 1.01    | 1.000  | 1 / 51 | 1.501  | 1.57/  |
| On-Site or In-Plant Training - All sectors - |          | 1,296  | 1,434   | 1,382  | 1,651  | 1,501  | 1,576  |
| 4 to 10 years (jobs)                         |          | 157    | 170     | 170    | 007    | 107    | 105    |
| On-Site or In-Plant Training - All sectors - |          | 154    | 173     | 170    | 206    | 186    | 195    |
| Over 10 years (jobs)                         |          | 11/1   | 1.010   | 1 170  | 1000   | 1,000  | 1 000  |
| Wage income - All (million \$2019)           |          | 1,141  | 1,212   | 1,172  | 1,358  | 1,230  | 1,282  |
|  |          |        |         |        |        |        |        |

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

| ••                                     |      |      |      |      |      |      |      |
|--|------|------|------|------|------|------|------|
| Item                                   | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
| Final energy use - Transportation (PJ) | 304  | 294  | 276  | 267  | 271  | 282  | 297  |

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

| The state of the s |      |      |      |      |      |      |      |
|--|------|------|------|------|------|------|------|
| Item   | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
| Final energy use - Residential (PJ)  | 126  | 123  | 123  | 125  | 127  | 130  | 132  |
| Final energy use - Commercial (PJ)   | 103  | 105  | 107  | 106  | 106  | 108  | 113  |
| Final energy use - Industry (PJ)   | 86.4 | 92   | 95.3 | 99.3 | 105  | 112  | 121  |

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

| Item  | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|------|------|------|------|------|------|------|
| Electricity distribution capital invested - |      | 1.54 | 1.6  | 1.88 | 1.97 | 2.43 | 2.57 |
| Cumulative 5-yr (billion \$2018)            |      |      |      |      |      |      |      |

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

| Item                                       | 2020  | 2025 | 2030  | 2035  | 2040  | 2045  | 2050 |
|--|-------|------|-------|-------|-------|-------|------|
| Sales of space heating units - Electric    | 2.42  | 11.3 | 11.7  | 12.3  | 12.7  | 13    | 13.3 |
| Heat Pump (%)                              |       |      |       |       |       |       |      |
| Sales of space heating units - Electric    | 3.86  | 7.17 | 7.1   | 7.05  | 7.03  | 6.83  | 6.47 |
| Resistance (%)                             |       |      |       |       |       |       |      |
| Sales of space heating units - Gas (%)     | 90.1  | 72.4 | 72    | 71.5  | 71.5  | 71.7  | 71.5 |
| Sales of space heating units - Fossil (%)  | 3.61  | 9.13 | 9.24  | 9.18  | 8.79  | 8.45  | 8.65 |
| Sales of water heating units - Electric    | 0     | 0    | 0     | 0     | 0     | 0     | 0    |
| Heat Pump (%)                              |       |      |       |       |       |       |      |
| Sales of water heating units - Electric    | 7.01  | 14.8 | 14.8  | 14.8  | 14.9  | 14.9  | 14.9 |
| Resistance (%)                             |       |      |       |       |       |       |      |
| Sales of water heating units - Gas Furnace | 92.3  | 84.4 | 84.4  | 84.4  | 84.4  | 84.4  | 84.3 |
| (%)  |       |      |       |       |       |       |      |
| Sales of water heating units - Other (%)   | 0.642 | 0.79 | 0.789 | 0.787 | 0.784 | 0.782 | 0.78 |
| Sales of cooking units - Electric          | 36.3  | 36.3 | 36.3  | 36.3  | 36.3  | 36.3  | 36.3 |
| Resistance (%)                             |       |      |       |       |       |       |      |
| Sales of cooking units - Gas (%)           | 63.7  | 63.7 | 63.7  | 63.7  | 63.7  | 63.7  | 63.7 |
| Residential HVAC investment in 2020s vs.   |       | 2.68 | 2.8   |       |       |       |      |
| REF - Cumulative 5-yr (billion \$2018)     |       |      |       |       |       |       |      |

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

| Item                                      | 2020  | 2025  | 2030  | 2035  | 2040  | 2045  | 2050  |
|---|-------|-------|-------|-------|-------|-------|-------|
| Sales of space heating units - Electric   | 0.749 | 14.6  | 48.1  | 74.1  | 78.4  | 78.8  | 78.8  |
| Heat Pump (%)                             |       |       |       |       |       |       |       |
| Sales of space heating units - Electric   | 0.855 | 4.29  | 8.82  | 15.6  | 19.9  | 20.6  | 20.7  |
| Resistance (%)                            |       |       |       |       |       |       |       |
| Sales of space heating units - Gas (%)    | 98.4  | 80.9  | 43    | 10.2  | 1.68  | 0.552 | 0.49  |
| Sales of space heating units - Fossil (%) | 0     | 0.225 | 0.13  | 0.037 | 0.005 | 0     | 0     |
| Sales of water heating units - Electric   | 0.008 | 0.03  | 0.03  | 0.03  | 0.03  | 0.03  | 0.03  |
| Heat Pump (%)                             |       |       |       |       |       |       |       |
| Sales of water heating units - Electric   | 0.41  | 1.46  | 1.46  | 1.47  | 1.46  | 1.47  | 1.46  |
| Resistance (%)                            |       |       |       |       |       |       |       |
| Sales of water heating units - Gas (%)    | 99.5  | 98.1  | 98.1  | 98.1  | 98.1  | 98.1  | 98.1  |
| Sales of water heating units - Other (%)  | 0.1   | 0.381 | 0.381 | 0.382 | 0.381 | 0.381 | 0.381 |
| Sales of cooking units - Electric         | 41.9  | 44.7  | 44.7  | 44.6  | 44.4  | 44.5  | 44.6  |
| Resistance (%)                            |       |       |       |       |       |       |       |
| Sales of cooking units - Gas (%)          | 58.1  | 55.3  | 55.3  | 55.4  | 55.6  | 55.5  | 55.4  |
| Commercial HVAC investment in 2020s -     |       | 7,440 | 7,806 |       |       |       |       |
| Cumulative 5-yr (million \$2018)          |       |       |       |       |       |       |       |

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

| Item                                   | 2020  | 2025  | 2030  | 2035  | 2040  | 2045  | 2050  |
|--|-------|-------|-------|-------|-------|-------|-------|
| Installed thermal - Coal (MW)          | 4,894 | 4,316 | 2,725 | 878   | 0     | 0     | 0     |
| Installed thermal - Natural gas (MW)   | 2,926 | 2,926 | 3,150 | 3,726 | 3,414 | 3,432 | 3,955 |
| Installed thermal - Nuclear (MW)       | 0     | 0     | 0     | 0     | 0     | 0     | 0     |
| Installed renewables - Rooftop PV (MW) | 540   | 833   | 1,113 | 1,450 | 1,851 | 2,318 | 2,871 |

# 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) | 768  | 768  | 768   | 768   | 768   | 768   | 768   |
| Installed renewables - Wind - Base land use assumptions (MW)  | 648  | 648  | 1,672 | 2,726 | 5,124 | 6,076 | 8,504 |

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

| Item                                    | 2020  | 2025  | 2030  | 2035  | 2040   | 2045   | 2050   |
|---|-------|-------|-------|-------|--------|--------|--------|
| Solar - Base land use assumptions (GWh) | 2,042 | 2,042 | 2,042 | 2,042 | 2,042  | 2,042  | 2,042  |
| Wind - Base land use assumptions (GWh)  | 1,915 | 1,915 | 4,866 | 7,868 | 14,699 | 17,313 | 24,028 |
| OffshoreWind - Base land use            | 0     | 0     | 0     | 0     | 0      | 0      | 0      |
| assumptions (GWh)                       |       |       |       |       |        |        |        |

### 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)                | -0.72  |      | 2.42   |      |      |      | 0.695  |
| Business-as-usual carbon sink - Retained in Hardwood Products (Mt CO2e/y) | -0.008 |      | -0.017 |      |      |      | -0.018 |
| Business-as-usual carbon sink - Total (Mt<br>CO2e/y)                      | -0.728 |      | 2.41   |      |      |      | 0.677  |

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

| Item                                     | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050   |
|--|------|------|------|------|------|------|--------|
| Carbon sink potential - Low - Accelerate |      |      |      |      |      |      | -707   |
| regeneration (1000 tCO2e/y)              |      |      |      |      |      |      |        |
| Carbon sink potential - Low - Avoid      |      |      |      |      |      |      | -140   |
| deforestation (1000 tCO2e/y)             |      |      |      |      |      |      |        |
| Carbon sink potential - Low - Extend     |      |      |      |      |      |      | -2,919 |
| rotation length (1000 tCO2e/y)           |      |      |      |      |      |      |        |
| Carbon sink potential - Low - Improve    |      |      |      |      |      |      | -5.38  |
| plantations (1000 tCO2e/y)               |      |      |      |      |      |      |        |
| Carbon sink potential - Low - Increase   |      |      |      |      |      |      | -9.92  |
| retention of HWP (1000 tCO2e/y)          |      |      |      |      |      |      |        |
| Carbon sink potential - Low - Increase   |      |      |      |      |      |      | -116   |
| trees outside forests (1000 tCO2e/y)     |      |      |      |      |      |      |        |
| Carbon sink potential - Low - Reforest   |      |      |      |      |      |      | -1,189 |
| cropland (1000 tCO2e/y)                  |      |      |      |      |      |      |        |
| Carbon sink potential - Low - Reforest   |      |      |      |      |      |      | -101   |
| pasture (1000 tCO2e/y)                   |      |      |      |      |      |      |        |
| Carbon sink potential - Low - Restore    |      |      |      |      |      |      | -1,568 |
| productivity (1000 tCO2e/y)              |      |      |      |      |      |      |        |
| Carbon sink potential - Low - All (not   |      |      |      |      |      |      | -6,755 |
| counting overlap) (1000 tCO2e/y)         |      |      |      |      |      |      |        |
| Carbon sink potential - Mid - Accelerate |      |      |      |      |      |      | -1,060 |
| regeneration (1000 tCO2e/y)              |      |      |      |      |      |      |        |
| Carbon sink potential - Mid - Avoid      |      |      |      |      |      |      | -489   |
| deforestation (1000 tCO2e/y)             |      |      |      |      |      |      |        |
| Carbon sink potential - Mid - Extend     |      |      |      |      |      |      | -5,260 |
| rotation length (1000 tCO2e/y)           |      |      |      |      |      |      |        |
| Carbon sink potential - Mid - Improve    |      |      |      |      |      |      | -7.89  |
| plantations (1000 tCO2e/y)               |      |      |      |      |      |      |        |
| Carbon sink potential - Mid - Increase   |      |      |      |      |      |      | -19.8  |
| retention of HWP (1000 tCO2e/y)          |      |      |      |      |      |      |        |
| Carbon sink potential - Mid - Increase   |      |      |      |      |      |      | -224   |
| trees outside forests (1000 tCO2e/y)     |      |      |      |      |      |      |        |
| Carbon sink potential - Mid - Reforest   |      |      |      |      |      |      | -1,783 |
| cropland (1000 tCO2e/y)                  |      |      |      |      |      |      |        |

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

| Item  | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050     |
|---|------|------|------|------|------|------|----------|
| Carbon sink potential - Mid - Reforest  |      |      |      |      |      |      | -715     |
| pasture (1000 tC02e/y)  |      |      |      |      |      |      | 0.100    |
| Carbon sink potential - Mid - Restore   |      |      |      |      |      |      | -3,109   |
| productivity (1000 tC02e/y)   |      |      |      |      |      |      | 10 / / 7 |
| Carbon sink potential - Mid - All (not  |      |      |      |      |      |      | -12,667  |
| counting overlap) (1000 tC02e/y)  |      |      |      |      |      |      | -1,412   |
| Carbon sink potential - High - Accelerate regeneration (1000 tC02e/y)               |      |      |      |      |      |      | -1,412   |
| Carbon sink potential - High - Avoid  |      |      |      |      |      |      | -838     |
| deforestation (1000 tCO2e/y)  |      |      |      |      |      |      | -030     |
| Carbon sink potential - High - Extend   |      |      |      |      |      |      | -7,600   |
| rotation length (1000 tCO2e/y)  |      |      |      |      |      |      | -1,600   |
| Carbon sink potential - High - Improve  |      |      |      |      |      |      | -10.6    |
| plantations (1000 tC02e/y)  |      |      |      |      |      |      | -10.0    |
| Carbon sink potential - High - Increase   |      |      |      |      |      |      | -29.8    |
| retention of HWP (1000 tCO2e/y)   |      |      |      |      |      |      | -27.0    |
| Carbon sink potential - High - Increase   |      |      |      |      |      |      | -332     |
| trees outside forests (1000 tC02e/y)  |      |      |      |      |      |      | 002      |
| Carbon sink potential - High - Reforest   |      |      |      |      |      |      | -2,378   |
| cropland (1000 tCO2e/y)   |      |      |      |      |      |      | 2,010    |
| Carbon sink potential - High - Reforest   |      |      |      |      |      |      | -1,329   |
| pasture (1000 tC02e/y)  |      |      |      |      |      |      | .,0_,    |
| Carbon sink potential - High - All (not   |      |      |      |      |      |      | -18,580  |
| counting overlap) (1000 tCO2e/y)  |      |      |      |      |      |      | ,        |
| Carbon sink potential - High - Restore  |      |      |      |      |      |      | -4,651   |
| productivity (1000 tCO2e/y)   |      |      |      |      |      |      | ,        |
| Land impacted for carbon sink potential -   |      |      |      |      |      |      | 116      |
| Low - Accelerate regeneration (1000   |      |      |      |      |      |      |          |
| hectares)   |      |      |      |      |      |      |          |
| Land impacted for carbon sink potential -   |      |      |      |      |      |      | 106      |
| Low - Avoid deforestation (over 30 years)   |      |      |      |      |      |      |          |
| (1000 hectares)   |      |      |      |      |      |      |          |
| Land impacted for carbon sink potential -   |      |      |      |      |      |      | 1,485    |
| Low - Extend rotation length (1000  |      |      |      |      |      |      |          |
| hectares)   |      |      |      |      |      |      |          |
| Land impacted for carbon sink potential -   |      |      |      |      |      |      | 1.95     |
| Low - Improve plantations (1000   |      |      |      |      |      |      |          |
| hectares)   |      |      |      |      |      |      |          |
| Land impacted for carbon sink potential -   |      |      |      |      |      |      | 0        |
| Low - Increase retention of HWP (1000   |      |      |      |      |      |      |          |
| hectares)   |      |      |      |      |      |      |          |
| Land impacted for carbon sink potential -   |      |      |      |      |      |      | 16.6     |
| Low - Increase trees outside forests  |      |      |      |      |      |      |          |
| (1000 hectares)   |      |      |      |      |      |      | 70 /     |
| Land impacted for carbon sink potential -   |      |      |      |      |      |      | 78.6     |
| Low - Reforest cropland (1000 hectares)   |      |      |      |      |      |      | / [[     |
| Land impacted for carbon sink potential -<br>Low - Reforest pasture (1000 hectares) |      |      |      |      |      |      | 6.55     |
| Land impacted for carbon sink potential -   |      |      |      |      |      |      | 933      |
| Low - Restore productivity (1000  |      |      |      |      |      |      | 933      |
| hectares)   |      |      |      |      |      |      |          |
| Land impacted for carbon sink potential -   |      |      |      |      |      |      | 2,743    |
| Low - Total impacted (over 30 years)  |      |      |      |      |      |      | 2,143    |
| (1000 hectares)   |      |      |      |      |      |      |          |
| Land impacted for carbon sink potential -   |      |      |      |      | +    |      | 173      |
| Mid - Accelerate regeneration (1000   |      |      |      |      |      |      | 113      |
| hectares)   |      |      |      |      |      |      |          |
| Land impacted for carbon sink potential -   |      |      |      |      | +    |      | 110      |
|   |      |      |      |      |      |      | 110      |
| Mid - Avoid deforestation (over 30 years)   | ı    | 1    |      |      |      |      |          |

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

| Item  | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050    |
|---|------|------|------|------|------|------|---------|
| Land impacted for carbon sink potential -   |      |      |      |      |      |      | 2,680   |
| Mid - Extend rotation length (1000  |      |      |      |      |      |      |         |
| hectares)   |      |      |      |      |      |      | 0.00    |
| Land impacted for carbon sink potential -   |      |      |      |      |      |      | 2.93    |
| Mid - Improve plantations (1000 hectares)   |      |      |      |      |      |      |         |
| Land impacted for carbon sink potential -   |      |      |      |      |      |      | 0       |
| Mid - Increase retention of HWP (1000   |      |      |      |      |      |      |         |
| hectares)   |      |      |      |      |      |      | 0/ 1    |
| Land impacted for carbon sink potential -   |      |      |      |      |      |      | 24.1    |
| Mid - Increase trees outside forests (1000  |      |      |      |      |      |      |         |
| hectares)   |      |      |      |      |      |      | 110     |
| Land impacted for carbon sink potential -   |      |      |      |      |      |      | 118     |
| Mid - Reforest cropland (1000 hectares)   |      |      |      |      |      |      |         |
| Land impacted for carbon sink potential -   |      |      |      |      |      |      | 47.3    |
| Mid - Reforest pasture (1000 hectares)  |      |      |      |      |      |      |         |
| Land impacted for carbon sink potential -   |      |      |      |      |      |      | 1,879   |
| Mid - Restore productivity (1000  |      |      |      |      |      |      |         |
| hectares)   |      |      |      |      |      |      |         |
| Land impacted for carbon sink potential -   |      |      |      |      |      |      | 5,034   |
| Mid - Total impacted (over 30 years) (1000  |      |      |      |      |      |      |         |
| hectares)   |      |      |      |      |      |      | 000     |
| Land impacted for carbon sink potential -   |      |      |      |      |      |      | 231     |
| High - Accelerate regeneration (1000  |      |      |      |      |      |      |         |
| hectares)   |      |      |      |      |      |      | 110     |
| Land impacted for carbon sink potential -   |      |      |      |      |      |      | 113     |
| High - Avoid deforestation (over 30 years)  |      |      |      |      |      |      |         |
| (1000 hectares)   |      |      |      |      |      |      | 0.07/   |
| Land impacted for carbon sink potential -   |      |      |      |      |      |      | 3,876   |
| High - Extend rotation length (1000   |      |      |      |      |      |      |         |
| hectares)   |      |      |      |      |      |      | 0.0     |
| Land impacted for carbon sink potential -   |      |      |      |      |      |      | 3.9     |
| High - Improve plantations (1000  |      |      |      |      |      |      |         |
| hectares)   |      |      |      |      |      |      |         |
| Land impacted for carbon sink potential -   |      |      |      |      |      |      | 0       |
| High - Increase retention of HWP (1000  |      |      |      |      |      |      |         |
| hectares)   |      |      |      |      |      |      | 01.5    |
| Land impacted for carbon sink potential -   |      |      |      |      |      |      | 31.5    |
| High - Increase trees outside forests   |      |      |      |      |      |      |         |
| (1000 hectares)   |      |      |      |      |      |      | 157     |
| Land impacted for carbon sink potential -   |      |      |      |      |      |      | 157     |
| High - Reforest cropland (1000 hectares)  Land impacted for carbon sink potential - |      |      |      |      |      |      | 37.8    |
|   |      |      |      |      |      |      | 31.0    |
| High - Reforest pasture (1000 hectares)  Land impacted for carbon sink potential -  |      |      |      |      |      |      | 1 E / 0 |
| •   |      |      |      |      |      |      | 1,542   |
| High - Restore productivity (1000   |      |      |      |      |      |      |         |
| hectares)   | +    |      |      |      |      |      | F 000   |
| Land impacted for carbon sink potential -   |      |      |      |      |      |      | 5,992   |
| High - Total impacted (over 30 years)   |      |      |      |      |      |      |         |
| (1000 hectares)   |      |      |      |      |      |      |         |