

# Net-Zero America - arkansas state report

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These data underlie graphs and tables presented in the Princeton Net-Zero America study:

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#### Notes

- These data are all data from the study available at <a href="https://netzeroamerica.prince-ton.edu">https://netzeroamerica.prince-ton.edu</a>.
- The Net-Zero America study describes five pathways to reach net-zero emissions and one "no new policies" reference scenario. In this document, state-level results are grouped by scenario. For some scenarios, the study generated national, but not statelevel results.
- Within results for a given scenario, data tables are organized into corresponding sections of the full net-zero study (e.g., Pillar 1, Pillar 2, etc.)
- For Pillar 6 (Land sinks), values shown are maximum carbon storage potentials.

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

| Item  | 2020 | 2025   | 2030   | 2035  | 2040 | 2045 | 2050 |
|---|------|--------|--------|-------|------|------|------|
| Commercial HVAC investment in 2020s -<br>Cumulative 5-yr (million \$2018) | 0    | 10,539 | 12,307 | 0     | 0    | 0    | 0    |
| Sales of cooking units - Electric<br>Resistance (%)                       | 30.1 | 44.4   | 79.2   | 86.1  | 86.5 | 86.5 | 86.5 |
| Sales of cooking units - Gas (%)  | 69.9 | 55.6   | 20.8   | 13.9  | 13.5 | 13.5 | 13.5 |
| Sales of space heating units - Electric<br>Heat Pump (%)                  | 2.92 | 27.3   | 77.1   | 91.1  | 92.3 | 92.3 | 92.3 |
| Sales of space heating units - Electric<br>Resistance (%)                 | 2.74 | 4.44   | 4.73   | 6.05  | 6.35 | 6.37 | 6.39 |
| Sales of space heating units - Fossil (%)                                 | 0    | 0      | 0      | 0     | 0    | 0    | 0    |
| Sales of space heating units - Gas Furnace (%)                            | 94.3 | 68.3   | 18.2   | 2.83  | 1.38 | 1.34 | 1.33 |
| Sales of water heating units - Electric<br>Heat Pump (%)                  | 0.08 | 10.7   | 56.3   | 66.5  | 66.9 | 66.9 | 66.9 |
| Sales of water heating units - Electric<br>Resistance (%)                 | 2.31 | 8.07   | 26.9   | 31.1  | 31.3 | 31.3 | 31.3 |
| Sales of water heating units - Gas Furnace (%)                            | 96.5 | 79.4   | 15     | 0.632 | 0    | 0    | 0    |
| Sales of water heating units - Other (%)                                  | 1.07 | 1.78   | 1.78   | 1.78  | 1.79 | 1.79 | 1.8  |

Table 2: E+ scenario - PILLAR 1: Efficiency/Electrification - Electricity demand

| Item  | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|------|------|------|------|------|------|------|
| Electricity distribution capital invested - |      | 2.42 | 2.48 | 3.87 | 4.09 | 4.01 | 4.2  |
| Cumulative 5-yr (billion \$2018)            |      |      |      |      |      |      |      |

Table 3: E+ scenario - PILLAR 1: Efficiency/Electrification - Overview

| Item                                   | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|------|------|------|------|------|------|------|
| Final energy use - Commercial (PJ)     | 90   | 90.4 | 87   | 81.6 | 77.4 | 76.4 | 78.1 |
| Final energy use - Industry (PJ)       | 236  | 242  | 246  | 246  | 250  | 250  | 255  |
| Final energy use - Residential (PJ)    | 123  | 117  | 108  | 95.6 | 85.1 | 78.9 | 76.1 |
| Final energy use - Transportation (PJ) | 324  | 303  | 265  | 220  | 179  | 155  | 146  |

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

| Item                                       | 2020 | 2025 | 2030 | 2035  | 2040  | 2045  | 2050  |
|--|------|------|------|-------|-------|-------|-------|
| Residential HVAC investment in 2020s vs.   | 0    | 2.31 | 2.82 | 0     | 0     | 0     | 0     |
| REF - Cumulative 5-yr (billion \$2018)     |      |      |      |       |       |       |       |
| Sales of cooking units - Electric          | 52.7 | 62.8 | 93.6 | 99.7  | 100   | 100   | 100   |
| Resistance (%)                             |      |      |      |       |       |       |       |
| Sales of cooking units - Gas (%)           | 47.3 | 37.2 | 6.37 | 0.321 | 0     | 0     | 0     |
| Sales of space heating units - Electric    | 11.9 | 27.2 | 74.3 | 84.8  | 85.3  | 85.2  | 85.2  |
| Heat Pump (%)                              |      |      |      |       |       |       |       |
| Sales of space heating units - Electric    | 34.9 | 33.8 | 14.2 | 9.82  | 9.65  | 9.82  | 9.86  |
| Resistance (%)                             |      |      |      |       |       |       |       |
| Sales of space heating units - Fossil (%)  | 8.14 | 11.9 | 5.59 | 4.18  | 4.11  | 4.04  | 4.03  |
| Sales of space heating units - Gas (%)     | 45.1 | 27.1 | 5.9  | 1.18  | 0.978 | 0.957 | 0.954 |
| Sales of water heating units - Electric    | 0    | 11.3 | 59.7 | 70.6  | 71.1  | 71.1  | 71.1  |
| Heat Pump (%)                              |      |      |      |       |       |       |       |
| Sales of water heating units - Electric    | 44.5 | 51.9 | 32.1 | 27.6  | 27.4  | 27.4  | 27.4  |
| Resistance (%)                             |      |      |      |       |       |       |       |
| Sales of water heating units - Gas Furnace | 53.7 | 35.3 | 6.65 | 0.277 | 0     | 0     | 0     |
| (%)  |      |      |      |       |       |       |       |
| Sales of water heating units - Other (%)   | 1.86 | 1.52 | 1.52 | 1.49  | 1.49  | 1.5   | 1.5   |

Table 5: E+ scenario - PILLAR 1: Efficiency/Electrification - Transportation

| Item                                       | 2020  | 2025  | 2030  | 2035  | 2040  | 2045  | 2050  |
|--|-------|-------|-------|-------|-------|-------|-------|
| Light-duty vehicle capital costs -         | 0     | 542   | 1,384 | 2,253 | 3,409 | 3,714 | 3,539 |
| Cumulative 5-yr (million \$2018)           |       |       |       |       |       |       |       |
| Public EV charging plugs - DC Fast (1000   | 0.043 | 0     | 1.12  | 0     | 5.01  | 0     | 8.11  |
| units)                                     |       |       |       |       |       |       |       |
| Public EV charging plugs - L2 (1000 units) | 0.243 | 0     | 26.9  | 0     | 120   | 0     | 195   |
| Vehicle sales - Heavy-duty - diesel (%)    | 97.2  | 92.1  | 67    | 23.3  | 4.22  | 0.628 | 0     |
| Vehicle sales - Heavy-duty - EV (%)        | 0.588 | 3.81  | 19    | 45.6  | 57.4  | 59.6  | 60    |
| Vehicle sales - Heavy-duty - gasoline (%)  | 0.227 | 0.227 | 0.176 | 0.066 | 0.013 | 0.002 | 0     |
| Vehicle sales - Heavy-duty - hybrid (%)    | 0.082 | 0.09  | 0.077 | 0.031 | 0.007 | 0.001 | 0     |
| Vehicle sales - Heavy-duty - hydrogen FC   | 0.392 | 2.54  | 12.7  | 30.4  | 38.2  | 39.7  | 40    |
| (%)  |       |       |       |       |       |       |       |
| Vehicle sales - Heavy-duty - other (%)     | 1.5   | 1.23  | 1.07  | 0.568 | 0.163 | 0.038 | 0     |
| Vehicle sales - Light-duty - diesel (%)    | 1.81  | 2.04  | 1.36  | 0.439 | 0.079 | 0.013 | 0     |
| Vehicle sales - Light-duty - EV (%)        | 3.04  | 12.5  | 42.3  | 80.1  | 96.1  | 99.3  | 100   |
| Vehicle sales - Light-duty - gasoline (%)  | 91.3  | 81    | 53.1  | 18.2  | 3.51  | 0.597 | 0     |
| Vehicle sales - Light-duty - hybrid (%)    | 3.57  | 3.93  | 2.92  | 1.11  | 0.266 | 0.056 | 0     |
| Vehicle sales - Light-duty - hydrogen FC   | 0.112 | 0.354 | 0.224 | 0.071 | 0.014 | 0.002 | 0     |
| (%)  |       |       |       |       |       |       |       |
| Vehicle sales - Light-duty - other (%)     | 0.113 | 0.11  | 0.074 | 0.026 | 0.005 | 0.001 | 0     |
| Vehicle sales - Medium-duty - diesel (%)   | 64.7  | 59.7  | 42.3  | 14.4  | 2.59  | 0.384 | 0     |
| Vehicle sales - Medium-duty - EV (%)       | 0.784 | 5.07  | 25.3  | 60.8  | 76.5  | 79.5  | 80    |
| Vehicle sales - Medium-duty - gasoline (%) | 33.7  | 33.3  | 25.5  | 9.32  | 1.77  | 0.277 | 0     |
| Vehicle sales - Medium-duty - hybrid (%)   | 0.363 | 0.402 | 0.341 | 0.14  | 0.03  | 0.005 | 0     |
| Vehicle sales - Medium-duty - hydrogen     | 0.196 | 1.27  | 6.33  | 15.2  | 19.1  | 19.9  | 20    |
| FC (%)                                     |       |       |       |       |       |       |       |
| Vehicle sales - Medium-duty - other (%)    | 0.253 | 0.255 | 0.205 | 0.083 | 0.019 | 0.004 | 0     |

Table 6: E+ scenario - PILLAR 2: Clean Electricity - Generating capacity

| Item  | 2020 | 2025  | 2030  | 2035   | 2040   | 2045   | 2050   |
|---|------|-------|-------|--------|--------|--------|--------|
| 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     | 0.022  | 0      | 0      | 0.032  |
| Capital invested - Biomass w/ccu power plant (billion \$2018)             | 0    | 0     | 0     | 0      | 4.37   | 0      | 0.029  |
| Capital invested - Solar PV - Base (billion \$2018)                       | 0    | 1.14  | 0.219 | 3.29   | 4.23   | 0.151  | 0      |
| Capital invested - Solar PV - Constrained (billion \$2018)                | 0    | 0.354 | 1.18  | 3.58   | 3.11   | 0.641  | 0      |
| Capital invested - Wind - Base (billion \$2018)                           | 0    | 3.48  | 8.29  | 10.5   | 12.8   | 10.5   | 21.2   |
| Capital invested - Wind - Constrained (billion \$2018)                    | 0    | 7.97  | 11.9  | 18.7   | 25.5   | 0.59   | 24.8   |
| Installed (cumulative) - OffshoreWind -<br>Base land use assumptions (MW) | 0    | 0     | 0     | 0      | 0      | 0      | 0      |
| Installed (cumulative) - Rooftop PV (MW)                                  | 14.5 | 25.5  | 37.9  | 57.4   | 85.2   | 121    | 168    |
| Installed (cumulative) - Solar - Base land use assumptions (MW)           | 179  | 1,034 | 1,217 | 4,205  | 8,279  | 8,432  | 8,432  |
| Installed (cumulative) - Wind - Base land use assumptions (MW)            | 84.5 | 2,450 | 8,676 | 17,144 | 27,980 | 37,359 | 57,370 |

Table 7: E+ 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 allam power plant (GWh)          | 0    | 0     | 0     | 21.7  | 21.7  | 21.7  | 53.4  |
| Biomass w/ccu power plant (GWh)                | 0    | 0     | 0     | 0     | 4,907 | 4,907 | 4,940 |
| Solar - Base land use assumptions (GWh)        | 409  | 1,634 | 348   | 5,704 | 7,789 | 293   | 0     |
| Solar - Constrained land use assumptions (GWh) | 390  | 0     | 2,376 | 8,004 | 5,204 | 551   | 0     |

# Table 7: E+ scenario - PILLAR 2: Clean Electricity - Generation (continued)

|   | -     | •      | -      |        |        |        |        |
|---|-------|--------|--------|--------|--------|--------|--------|
| Item                                    | 2020  | 2025   | 2030   | 2035   | 2040   | 2045   | 2050   |
| Wind - Base land use assumptions (GWh)  | 315   | 7,953  | 20,431 | 28,313 | 34,898 | 28,467 | 60,107 |
| Wind - Constrained land use assumptions | 1,989 | 17,265 | 30,171 | 46,574 | 73,989 | 1,830  | 74,128 |
| (GWh)                                   |       |        |        |        |        |        |        |

### Table 8: E+ scenario - PILLAR 3: Clean fuels - Bioenergy

| Item   | 2020 | 2025 | 2030 | 2035  | 2040  | 2045  | 2050  |
|--|------|------|------|-------|-------|-------|-------|
| Biomass purchases (million \$2018/year)      | 0    | 0    | 0    | 79.9  | 391   | 858   | 1,068 |
| Conversion capital investment -              | 0    | 0    | 0    | 1,551 | 6,476 | 8,924 | 4,059 |
| Cumulative 5-yr (million \$2018)             |      |      |      |       |       |       |       |
| Number of facilities - Allam power w ccu     | 0    | 0    | 0    | 1     | 1     | 1     | 2     |
| (quantity)                                   |      |      |      |       |       |       |       |
| Number of facilities - Beccs hydrogen        | 0    | 0    | 0    | 1     | 4     | 14    | 17    |
| (quantity)                                   |      |      |      |       |       |       |       |
| Number of facilities - Diesel (quantity)     | 0    | 0    | 0    | 0     | 0     | 0     | 0     |
| Number of facilities - Diesel ccu (quantity) | 0    | 0    | 0    | 1     | 1     | 1     | 2     |
| Number of facilities - Power (quantity)      | 0    | 0    | 0    | 0     | 0     | 0     | 0     |
| Number of facilities - Power ccu             | 0    | 0    | 0    | 0     | 4     | 4     | 5     |
| (quantity)                                   |      |      |      |       |       |       |       |
| Number of facilities - Pyrolysis (quantity)  | 0    | 0    | 0    | 0     | 0     | 0     | 0     |
| Number of facilities - Pyrolysis ccu         | 0    | 0    | 0    | 1     | 1     | 1     | 2     |
| (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     |

### Table 9: E+ scenario - PILLAR 4: CCUS - CO2 capture

| Item                               | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|------------------------------------|------|------|------|------|------|------|------|
| Annual - All (MMT)                 |      | 0    | 0    | 1.95 | 9.81 | 21.3 | 26.4 |
| Annual - BECCS (MMT)               |      | 0    | 0    | 1.95 | 9.81 | 21.3 | 26.4 |
| Annual - Cement and lime (MMT)     |      | 0    | 0    | 0    | 0    | 0    | 0    |
| Annual - NGCC (MMT)                |      | 0    | 0    | 0    | 0    | 0    | 0    |
| Cumulative - All (MMT)             |      | 0    | 0    | 1.95 | 11.8 | 33   | 59.5 |
| Cumulative - BECCS (MMT)           |      | 0    | 0    | 1.95 | 11.8 | 33   | 59.5 |
| Cumulative - Cement and lime (MMT) |      | 0    | 0    | 0    | 0    | 0    | 0    |
| Cumulative - NGCC (MMT)            |      | 0    | 0    | 0    | 0    | 0    | 0    |

### Table 10: E+ scenario - PILLAR 4: CCUS - CO2 pipelines

| Item   | 2020 | 2025 | 2030 | 2035 | 2040 | 2045  | 2050  |
|--|------|------|------|------|------|-------|-------|
| All (km)                                       |      | 0    | 39.8 | 140  | 420  | 894   | 1,699 |
| Cumulative investment - All (million \$2018)   |      | 0    | 244  | 540  | 812  | 1,335 | 2,026 |
| Cumulative investment - Spur (million \$2018)  |      | 0    | 0    | 50.8 | 323  | 846   | 1,537 |
| Cumulative investment - Trunk (million \$2018) |      | 0    | 244  | 489  | 489  | 489   | 489   |
| Spur (km)                                      |      | 0    | 0    | 60.8 | 341  | 815   | 1,619 |
| Trunk (km)                                     |      | 0    | 39.8 | 79.6 | 79.6 | 79.6  | 79.6  |

### Table 11: E+ scenario - PILLAR 4: CCUS - CO2 storage

| Item  | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050  |
|---|------|------|------|------|------|------|-------|
| CO2 storage (MMT)   |      | 0    | 2.19 | 8.81 | 16.3 | 25.8 | 35.4  |
| Injection wells (wells)   |      | 0    | 2    | 10   | 18   | 30   | 38    |
| Resource characterization, appraisal, permitting costs (million \$2020) |      | 14.2 | 255  | 404  | 404  | 404  | 404   |
| Wells and facilities construction costs (million \$2020)                |      | 0    | 78.2 | 305  | 543  | 909  | 1,128 |

Table 12: E+ scenario - PILLAR 6: Land sinks - Agriculture

| Item                                     | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050    |
|--|------|------|------|------|------|------|---------|
| Carbon sink potential - Aggressive       |      |      |      |      |      |      | -243    |
| deployment - Corn-ethanol to energy      |      |      |      |      |      |      |         |
| grasses (1000 tCO2e/y)                   |      |      |      |      |      |      |         |
| Carbon sink potential - Aggressive       |      |      |      |      |      |      | -10,076 |
| deployment - Cropland measures (1000     |      |      |      |      |      |      |         |
| tCO2e/y)                                 |      |      |      |      |      |      |         |
| Carbon sink potential - Aggressive       |      |      |      |      |      |      | -64.8   |
| deployment - Permanent conservation      |      |      |      |      |      |      |         |
| cover (1000 tCO2e/y)                     |      |      |      |      |      |      |         |
| Carbon sink potential - Aggressive       |      |      |      |      |      |      | -10,383 |
| deployment - Total (1000 tC02e/y)        |      |      |      |      |      |      |         |
| Carbon sink potential - Moderate         |      |      |      |      |      |      | -243    |
| deployment - Corn-ethanol to energy      |      |      |      |      |      |      |         |
| grasses (1000 tC02e/y)                   |      |      |      |      |      |      |         |
| Carbon sink potential - Moderate         |      |      |      |      |      |      | -5,130  |
| deployment - Cropland measures (1000     |      |      |      |      |      |      | 0,100   |
| tCO2e/y)                                 |      |      |      |      |      |      |         |
| Carbon sink potential - Moderate         | +    |      |      |      |      | +    | -32.4   |
| deployment - Permanent conservation      |      |      |      |      |      |      | 02.4    |
| cover (1000 tC02e/y)                     |      |      |      |      |      |      |         |
| Carbon sink potential - Moderate         | +    |      | +    |      |      |      | -5,405  |
| deployment - Total (1000 tCO2e/y)        |      |      |      |      |      |      | -0,400  |
| Land impacted for carbon sink -          |      |      |      |      |      |      | 96.4    |
| Aggressive deployment - Corn-ethanol to  |      |      |      |      |      |      | 70.4    |
| energy grasses (1000 hectares)           |      |      |      |      |      |      |         |
| Land impacted for carbon sink -          |      |      |      |      |      |      | 2,955   |
| Aggressive deployment - Cropland         |      |      |      |      |      |      | 2,900   |
| measures (1000 hectares)                 |      |      |      |      |      |      |         |
| Land impacted for carbon sink -          |      |      |      |      |      |      | 110     |
|  |      |      |      |      |      |      | 118     |
| Aggressive deployment - Permanent        |      |      |      |      |      |      |         |
| conservation cover (1000 hectares)       |      |      |      |      |      |      | 0.170   |
| Land impacted for carbon sink -          |      |      |      |      |      |      | 3,170   |
| Aggressive deployment - Total (1000      |      |      |      |      |      |      |         |
| hectares)                                |      |      |      |      |      |      |         |
| Land impacted for carbon sink - Moderate |      |      |      |      |      |      | 96.4    |
| deployment - Corn-ethanol to energy      |      |      |      |      |      |      |         |
| grasses (1000 hectares)                  |      |      |      |      |      |      |         |
| Land impacted for carbon sink - Moderate |      |      |      |      |      |      | 1,507   |
| deployment - Cropland measures (1000     |      |      |      |      |      |      |         |
| hectares)                                |      |      |      |      |      |      |         |
| Land impacted for carbon sink - Moderate | T    |      | T    |      |      | T    | 58.9    |
| deployment - Permanent conservation      |      |      |      |      |      |      |         |
| cover (1000 hectares)                    |      |      |      |      |      |      |         |
| Land impacted for carbon sink - Moderate |      |      |      |      |      |      | 1,662   |
| deployment - Total (1000 hectares)       |      |      |      |      |      |      |         |

Table 13: E+ scenario - PILLAR 6: Land sinks - Forests

| Item                                      | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050    |
|---|------|------|------|------|------|------|---------|
| Carbon sink potential - High - Accelerate |      |      |      |      |      |      | -356    |
| regeneration (1000 tCO2e/y)               |      |      |      |      |      |      |         |
| Carbon sink potential - High - All (not   |      |      |      |      |      |      | -46,154 |
| counting overlap) (1000 tCO2e/y)          |      |      |      |      |      |      |         |
| Carbon sink potential - High - Avoid      |      |      |      |      |      |      | -1,334  |
| deforestation (1000 tCO2e/y)              |      |      |      |      |      |      |         |
| Carbon sink potential - High - Extend     |      |      |      |      |      |      | -9,227  |
| rotation length (1000 tCO2e/y)            |      |      |      |      |      |      |         |
| Carbon sink potential - High - Improve    |      |      |      |      |      |      | -3,044  |
| plantations (1000 tCO2e/y)                |      |      |      |      |      |      |         |
| Carbon sink potential - High - Increase   |      |      |      |      |      |      | -13,825 |
| retention of HWP (1000 tCO2e/y)           |      |      |      |      |      |      |         |

Table 13: E+ scenario - PILLAR 6: Land sinks - Forests (continued)

| Item I3: E+ Scenario - PILLAR 6: Land sini | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050    |
|--|------|------|------|------|------|------|---------|
| Carbon sink potential - High - Increase    | 2020 | 2020 | 2000 | 2000 | 2040 | 2040 | -1,120  |
| trees outside forests (1000 tCO2e/y)       |      |      |      |      |      |      | .,0     |
| Carbon sink potential - High - Reforest    |      |      |      |      |      | +    | -1,077  |
| cropland (1000 tCO2e/y)                    |      |      |      |      |      |      | , -     |
| Carbon sink potential - High - Reforest    |      |      |      |      |      |      | -11,526 |
| pasture (1000 tC02e/y)                     |      |      |      |      |      |      |         |
| Carbon sink potential - High - Restore     |      |      |      |      |      |      | -4,644  |
| productivity (1000 tCO2e/y)                |      |      |      |      |      |      |         |
| Carbon sink potential - Low - Accelerate   |      |      |      |      |      |      | -178    |
| regeneration (1000 tCO2e/y)                |      |      |      |      |      |      |         |
| Carbon sink potential - Low - All (not     |      |      |      |      |      |      | -13,471 |
| counting overlap) (1000 tCO2e/y)           |      |      |      |      |      |      |         |
| Carbon sink potential - Low - Avoid        |      |      |      |      |      |      | -222    |
| deforestation (1000 tCO2e/y)               |      |      |      |      |      |      |         |
| Carbon sink potential - Low - Extend       |      |      |      |      |      |      | -3,544  |
| rotation length (1000 tCO2e/y)             |      |      |      |      |      |      |         |
| Carbon sink potential - Low - Improve      |      |      |      |      |      |      | -1,549  |
| plantations (1000 tCO2e/y)                 |      |      |      |      |      |      |         |
| Carbon sink potential - Low - Increase     |      |      |      |      |      |      | -4,608  |
| retention of HWP (1000 tCO2e/y)            |      |      |      |      |      |      |         |
| Carbon sink potential - Low - Increase     |      |      |      |      |      |      | -392    |
| trees outside forests (1000 tCO2e/y)       |      |      |      |      |      |      |         |
| Carbon sink potential - Low - Reforest     |      |      |      |      |      |      | -538    |
| cropland (1000 tCO2e/y)                    |      |      |      |      |      |      |         |
| Carbon sink potential - Low - Reforest     |      |      |      |      |      |      | -873    |
| pasture (1000 tCO2e/y)                     |      |      |      |      |      |      |         |
| Carbon sink potential - Low - Restore      |      |      |      |      |      |      | -1,565  |
| productivity (1000 tCO2e/y)                |      |      |      |      |      |      |         |
| Carbon sink potential - Mid - Accelerate   |      |      |      |      |      |      | -267    |
| regeneration (1000 tCO2e/y)                |      |      |      |      |      |      |         |
| Carbon sink potential - Mid - All (not     |      |      |      |      |      |      | -29,786 |
| counting overlap) (1000 tCO2e/y)           |      |      |      |      |      |      |         |
| Carbon sink potential - Mid - Avoid        |      |      |      |      |      |      | -778    |
| deforestation (1000 tCO2e/y)               |      |      |      |      |      |      |         |
| Carbon sink potential - Mid - Extend       |      |      |      |      |      |      | -6,386  |
| rotation length (1000 tCO2e/y)             |      |      |      |      |      |      |         |
| Carbon sink potential - Mid - Improve      |      |      |      |      |      |      | -2,270  |
| plantations (1000 tCO2e/y)                 |      |      |      |      |      |      |         |
| Carbon sink potential - Mid - Increase     |      |      |      |      |      |      | -9,217  |
| retention of HWP (1000 tCO2e/y)            |      |      |      |      |      |      |         |
| Carbon sink potential - Mid - Increase     |      |      |      |      |      |      | -756    |
| trees outside forests (1000 tC02e/y)       |      |      |      |      |      |      |         |
| Carbon sink potential - Mid - Reforest     |      |      |      |      |      |      | -807    |
| cropland (1000 tCO2e/y)                    |      |      |      |      |      |      |         |
| Carbon sink potential - Mid - Reforest     |      |      |      |      |      |      | -6,200  |
| pasture (1000 tCO2e/y)                     |      |      |      |      |      |      |         |
| Carbon sink potential - Mid - Restore      |      |      |      |      |      |      | -3,105  |
| productivity (1000 tCO2e/y)                |      |      |      |      |      |      |         |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 58.3    |
| High - Accelerate regeneration (1000       |      |      |      |      |      |      |         |
| hectares)                                  |      |      |      |      |      |      |         |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 181     |
| High - Avoid deforestation (over 30 years) |      |      |      |      |      |      |         |
| (1000 hectares)                            |      |      |      |      |      |      |         |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 4,705   |
| High - Extend rotation length (1000        |      |      |      |      |      |      |         |
| hectares)                                  |      |      |      |      |      |      |         |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 1,121   |
| High - Improve plantations (1000           |      |      |      |      |      |      |         |
| hectares)                                  |      |      |      |      |      |      |         |

Table 13: E+ scenario - PILLAR 6: Land sinks - Forests (continued)

| Item   | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050  |
|--|------|------|------|------|------|------|-------|
| Land impacted for carbon sink potential -                                      |      |      |      |      |      |      | 0     |
| High - Increase retention of HWP (1000 hectares)                               |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -                                      |      |      |      |      |      |      | 106   |
| High - Increase trees outside forests  |      |      |      |      |      |      | 100   |
| (1000 hectares)  |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -                                      |      |      |      |      |      |      | 71.2  |
| High - Reforest cropland (1000 hectares)                                       |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -                                      |      |      |      |      |      |      | 327   |
| High - Reforest pasture (1000 hectares)  |      |      |      |      |      |      | 1 500 |
| Land impacted for carbon sink potential -<br>High - Restore productivity (1000 |      |      |      |      |      |      | 1,539 |
| hectares)  |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -                                      |      |      |      |      |      |      | 8,110 |
| High - Total impacted (over 30 years)  |      |      |      |      |      |      | •     |
| (1000 hectares)  |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -                                      |      |      |      |      |      |      | 29.1  |
| Low - Accelerate regeneration (1000  |      |      |      |      |      |      |       |
| hectares)  |      |      |      |      |      |      | 470   |
| Land impacted for carbon sink potential -                                      |      |      |      |      |      |      | 170   |
| Low - Avoid deforestation (over 30 years)<br>(1000 hectares)                   |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -                                      |      |      |      |      |      |      | 1,803 |
| Low - Extend rotation length (1000   |      |      |      |      |      |      | 1,003 |
| hectares)  |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -                                      |      |      |      |      |      |      | 561   |
| Low - Improve plantations (1000  |      |      |      |      |      |      |       |
| hectares)  |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -                                      |      |      |      |      |      |      | 0     |
| Low - Increase retention of HWP (1000  |      |      |      |      |      |      |       |
| hectares)  |      |      |      |      |      |      | F.    |
| Land impacted for carbon sink potential -                                      |      |      |      |      |      |      | 56    |
| Low - Increase trees outside forests (1000 hectares)                           |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -                                      |      |      |      |      |      |      | 35.6  |
| Low - Reforest cropland (1000 hectares)  |      |      |      |      |      |      | 00.0  |
| Land impacted for carbon sink potential -                                      |      |      |      |      |      |      | 56.8  |
| Low - Reforest pasture (1000 hectares)   |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -                                      |      |      |      |      |      |      | 931   |
| Low - Restore productivity (1000   |      |      |      |      |      |      |       |
| hectares)  |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -                                      |      |      |      |      |      |      | 3,642 |
| Low - Total impacted (over 30 years)   |      |      |      |      |      |      |       |
| (1000 hectares)  Land impacted for carbon sink potential -                     |      |      |      |      |      |      | 43.7  |
| Mid - Accelerate regeneration (1000  |      |      |      |      |      |      | 43.1  |
| hectares)  |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -                                      |      |      |      |      |      |      | 175   |
| Mid - Avoid deforestation (over 30 years)                                      |      |      |      |      |      |      |       |
| (1000 hectares)  |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -                                      |      |      |      |      |      |      | 3,254 |
| Mid - Extend rotation length (1000   |      |      |      |      |      |      |       |
| hectares)  |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -                                      |      |      |      |      |      |      | 844   |
| 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 -                                      |      |      |      |      |      |      | 81.2  |
| Mid - Increase trees outside forests (1000                                     |      |      |      |      |      |      | 01.2  |
| hectares)  |      |      |      |      |      |      |       |

| Table 13: E+        | ccanario - | DTII AD 6. | Land cinke   | Enracte     | (continued)   |
|---------------------|------------|------------|--------------|-------------|---------------|
| Table 13: <i>E+</i> | scenario - | PILLAR 6:  | Luna sinks - | · Forests i | I CONLINUEU I |

| Item                                       | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050  |
|--|------|------|------|------|------|------|-------|
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 53.4  |
| Mid - Reforest cropland (1000 hectares)    |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 410   |
| Mid - Reforest pasture (1000 hectares)     |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 1,876 |
| Mid - Restore productivity (1000           |      |      |      |      |      |      |       |
| hectares)                                  |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 6,737 |
| Mid - Total impacted (over 30 years) (1000 |      |      |      |      |      |      |       |
| hectares)                                  |      |      |      |      |      |      |       |

# Table 14: E+ scenario - IMPACTS - Fossil fuel industries

| Item  | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050  |
|---|------|------|------|------|------|------|-------|
| Natural gas consumption - Annual (tcf)      |      | 279  | 235  | 189  | 142  | 89.4 | 62    |
| Natural gas consumption - Cumulative (tcf)  |      | 0    | 0    | 0    | 0    | 0    | 5,687 |
| Natural gas production - Annual (tcf)       |      | 720  | 681  | 593  | 501  | 397  | 309   |
| Oil consumption - Annual (million bbls)     |      | 54.3 | 46.3 | 34.6 | 23.5 | 14.8 | 7.61  |
| Oil consumption - Cumulative (million bbls) |      | 0    | 0    | 0    | 0    | 0    | 1,065 |
| Oil production - Annual (million bbls)      |      | 6.5  | 6.52 | 6.52 | 5.16 | 4.2  | 2.79  |

### Table 15: E+ scenario - IMPACTS - Health

| Item                                  | 2020 | 2025 | 2030  | 2035  | 2040  | 2045  | 2050  |
|---------------------------------------|------|------|-------|-------|-------|-------|-------|
| Monetary damages from air pollution - |      | 319  | 0.217 | 0.206 | 0.16  | 0.104 | 0.004 |
| Coal (million 2019\$)                 |      |      |       |       |       |       |       |
| Monetary damages from air pollution - |      | 113  | 64.1  | 34    | 28.5  | 12.5  | 6.16  |
| Natural Gas (million 2019\$)          |      |      |       |       |       |       |       |
| Monetary damages from air pollution - |      | 404  | 374   | 283   | 163   | 74.8  | 30.8  |
| Transportation (million 2019\$)       |      |      |       |       |       |       |       |
| Premature deaths from air pollution - |      | 36   | 0.024 | 0.023 | 0.018 | 0.012 | 0     |
| Coal (deaths)                         |      |      |       |       |       |       |       |
| Premature deaths from air pollution - |      | 12.8 | 7.24  | 3.84  | 3.21  | 1.41  | 0.695 |
| Natural Gas (deaths)                  |      |      |       |       |       |       |       |
| Premature deaths from air pollution - |      | 45.5 | 42.1  | 31.8  | 18.3  | 8.42  | 3.46  |
| Transportation (deaths)               |      |      |       |       |       |       |       |

### Table 16: E+ scenario - IMPACTS - Jobs

| Item  | 2020 | 2025   | 2030   | 2035   | 2040   | 2045   | 2050   |
|---|------|--------|--------|--------|--------|--------|--------|
| By economic sector - Agriculture (jobs)     |      | 122    | 247    | 259    | 772    | 1,312  | 1,336  |
| By economic sector - Construction (jobs)    |      | 4,896  | 6,363  | 11,223 | 15,191 | 14,823 | 20,176 |
| By economic sector - Manufacturing          |      | 5,351  | 6,235  | 8,016  | 8,218  | 7,279  | 9,324  |
| (jobs)                                      |      |        |        |        |        |        |        |
| By economic sector - Mining (jobs)          |      | 4,370  | 3,274  | 2,308  | 1,469  | 913    | 501    |
| By economic sector - Other (jobs)           |      | 378    | 481    | 1,264  | 1,956  | 1,707  | 2,330  |
| By economic sector - Pipeline (jobs)        |      | 462    | 422    | 348    | 245    | 210    | 294    |
| By economic sector - Professional (jobs)    |      | 3,306  | 4,324  | 7,167  | 10,566 | 12,169 | 16,526 |
| By economic sector - Trade (jobs)           |      | 2,329  | 2,667  | 4,131  | 5,742  | 6,200  | 8,554  |
| By economic sector - Utilities (jobs)       |      | 5,433  | 5,851  | 9,006  | 12,339 | 13,051 | 18,471 |
| By education level - All sectors -          |      | 8,235  | 9,338  | 13,898 | 17,964 | 18,160 | 24,604 |
| Associates degree or some college (jobs)    |      |        |        |        |        |        |        |
| By education level - All sectors -          |      | 5,967  | 6,481  | 9,160  | 11,755 | 12,197 | 16,367 |
| Bachelors degree (jobs)                     |      |        |        |        |        |        |        |
| By education level - All sectors - Doctoral |      | 206    | 233    | 346    | 474    | 521    | 698    |
| degree (jobs)                               |      |        |        |        |        |        |        |
| By education level - All sectors - High     |      | 10,795 | 12,232 | 18,040 | 23,297 | 23,593 | 31,540 |
| school diploma or less (jobs)               |      |        |        |        |        |        |        |

Table 16: E+ scenario - IMPACTS - Jobs (continued)

| Table 10. L+ Scellal 10 - IMPACIS - Jubs (cui | •    |        |        |        |        |        |        |
|---|------|--------|--------|--------|--------|--------|--------|
| Item  | 2020 | 2025   | 2030   | 2035   | 2040   | 2045   | 2050   |
| By education level - All sectors - Masters    |      | 1,442  | 1,582  | 2,278  | 3,008  | 3,194  | 4,302  |
| or professional degree (jobs)                 |      |        |        |        |        |        |        |
| By resource sector - Biomass (jobs)           |      | 523    | 682    | 737    | 2,323  | 4,786  | 5,704  |
| By resource sector - CO2 (jobs)               |      | 5.51   | 379    | 463    | 249    | 721    | 1,891  |
| By resource sector - Coal (jobs)              |      | 901    | 80.8   | 0      | 0      | 0      | 0      |
| By resource sector - Grid (jobs)              |      | 5,282  | 7,780  | 14,354 | 20,576 | 22,284 | 32,952 |
| By resource sector - Natural Gas (jobs)       |      | 9,323  | 7,514  | 5,850  | 5,167  | 3,424  | 1,726  |
| By resource sector - Nuclear (jobs)           |      | 549    | 0.005  | 0.01   | 0.011  | 0.023  | 0.035  |
| By resource sector - Oil (jobs)               |      | 3,609  | 2,977  | 2,297  | 1,546  | 1,027  | 571    |
| By resource sector - Solar (jobs)             |      | 2,982  | 2,521  | 6,677  | 8,730  | 4,946  | 5,816  |
| By resource sector - Wind (jobs)              |      | 3,471  | 7,932  | 13,343 | 17,906 | 20,476 | 28,852 |
| Median wages - Annual - All (\$2019 per       |      | 53,507 | 53,547 | 53,429 | 54,135 | 55,332 | 56,196 |
| job)  |      |        |        |        |        |        |        |
| On-Site or In-Plant Training - Total jobs - 1 |      | 4,292  | 4,836  | 7,148  | 9,211  | 9,294  | 12,561 |
| to 4 years (jobs)                             |      |        |        |        |        |        |        |
| On-Site or In-Plant Training - Total jobs - 4 |      | 1,721  | 1,962  | 2,972  | 3,911  | 3,977  | 5,402  |
| to 10 years (jobs)                            |      |        |        |        |        |        |        |
| On-Site or In-Plant Training - Total jobs -   |      | 4,337  | 4,872  | 7,160  | 9,290  | 9,515  | 12,757 |
| None (jobs)                                   |      |        |        |        |        |        |        |
| On-Site or In-Plant Training - Total jobs -   |      | 216    | 251    | 381    | 498    | 508    | 693    |
| Over 10 years (jobs)                          |      |        |        |        |        |        |        |
| On-Site or In-Plant Training - Total jobs -   |      | 16,078 | 17,944 | 26,061 | 33,587 | 34,369 | 46,099 |
| Up to 1 year (jobs)                           |      |        |        |        |        |        |        |
| On-the-Job Training - All sectors - 1 to 4    |      | 5,538  | 6,243  | 9,246  | 11,929 | 12,040 | 16,297 |
| years (jobs)                                  |      |        |        |        |        |        |        |
| On-the-Job Training - All sectors - 4 to 10   |      | 1,631  | 1,885  | 2,911  | 3,863  | 3,924  | 5,347  |
| years (jobs)                                  |      |        |        |        |        |        |        |
| On-the-Job Training - All sectors - None      |      | 1,449  | 1,598  | 2,345  | 3,041  | 3,108  | 4,169  |
| (jobs)  |      |        |        |        |        |        |        |
| On-the-Job Training - All sectors - Over 10   |      | 262    | 294    | 430    | 537    | 527    | 703    |
| years (jobs)                                  |      |        |        |        |        |        |        |
| On-the-Job Training - All sectors - Up to 1   |      | 17,766 | 19,845 | 28,789 | 37,127 | 38,066 | 50,995 |
| year (jobs)                                   |      |        |        |        |        |        |        |
| Related work experience - All sectors - 1     |      | 9,737  | 10,843 | 15,763 | 20,344 | 20,782 | 27,917 |
| to 4 years (jobs)                             |      |        |        |        |        |        |        |
| Related work experience - All sectors - 4     |      | 6,307  | 7,048  | 10,298 | 13,269 | 13,528 | 18,258 |
| to 10 years (jobs)                            |      |        |        |        |        |        |        |
| Related work experience - All sectors -       |      | 3,765  | 4,235  | 6,234  | 8,105  | 8,276  | 11,117 |
| None (jobs)                                   |      |        |        |        |        |        |        |
| Related work experience - All sectors -       |      | 1,750  | 1,931  | 2,762  | 3,489  | 3,529  | 4,753  |
| Over 10 years (jobs)                          |      |        |        |        |        |        |        |
| Related work experience - All sectors - Up    |      | 5,087  | 5,808  | 8,665  | 11,289 | 11,550 | 15,465 |
| to 1 year (jobs)                              |      |        |        |        |        |        |        |
| Wage income - All (million \$2019)            |      | 1,426  | 1,599  | 2,336  | 3,059  | 3,191  | 4,356  |
|   |      |        |        |        |        |        |        |

Table 17: E- scenario - PILLAR 1: Efficiency/Electrification - Commercial

| Item                                       | 2020 | 2025   | 2030   | 2035 | 2040 | 2045 | 2050 |
|--|------|--------|--------|------|------|------|------|
| Commercial HVAC investment in 2020s -      | 0    | 10,527 | 12,223 | 0    | 0    | 0    | 0    |
| Cumulative 5-yr (million \$2018)           |      |        |        |      |      |      |      |
| Sales of cooking units - Electric          | 30.1 | 34.2   | 39     | 52   | 70.1 | 81.2 | 85   |
| Resistance (%)                             |      |        |        |      |      |      |      |
| Sales of cooking units - Gas (%)           | 69.9 | 65.8   | 61     | 48   | 29.9 | 18.8 | 15   |
| Sales of space heating units - Electric    | 2.92 | 17.8   | 23.5   | 40   | 65.6 | 83.3 | 89.8 |
| Heat Pump (%)                              |      |        |        |      |      |      |      |
| Sales of space heating units - Electric    | 2.74 | 4.44   | 4.48   | 4.65 | 5.07 | 5.74 | 6.19 |
| Resistance (%)                             |      |        |        |      |      |      |      |
| Sales of space heating units - Fossil (%)  | 0    | 0      | 0      | 0    | 0    | 0    | 0    |
| Sales of space heating units - Gas Furnace | 94.3 | 77.8   | 72     | 55.4 | 29.3 | 11   | 3.97 |
| (%)  |      |        |        |      |      |      |      |

| Table 17: E- scenario -   | DILLAR 1. Efficience | //Electrification - | Commercial     | continued  |
|---------------------------|----------------------|---------------------|----------------|------------|
| Table II. E- Scellul IO - | PILLAK I. EIIILIEIIL | // EIECH 111CUHUH - | CUITITIETCIULT | Continueur |

| Item                                       | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|------|------|------|------|------|------|------|
| Sales of water heating units - Electric    | 0.08 | 1.96 | 7.15 | 22.1 | 45   | 59.9 | 65.1 |
| Heat Pump (%)                              |      |      |      |      |      |      |      |
| Sales of water heating units - Electric    | 2.31 | 4.44 | 6.56 | 12.7 | 22.2 | 28.4 | 30.5 |
| Resistance (%)                             |      |      |      |      |      |      |      |
| Sales of water heating units - Gas Furnace | 96.5 | 91.8 | 84.5 | 63.4 | 31   | 9.91 | 2.58 |
| (%)  |      |      |      |      |      |      |      |
| Sales of water heating units - Other (%)   | 1.07 | 1.78 | 1.78 | 1.78 | 1.79 | 1.79 | 1.8  |

# Table 18: E- scenario - PILLAR 1: Efficiency/Electrification - Electricity demand

| Item  | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|------|------|------|------|------|------|------|
| Electricity distribution capital invested - |      | 2.1  | 2.13 | 2.57 | 2.64 | 3.75 | 3.95 |
| Cumulative 5-yr (billion \$2018)            |      |      |      |      |      |      |      |

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

| Item                                   | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|------|------|------|------|------|------|------|
| Final energy use - Commercial (PJ)     | 90   | 90.7 | 90.4 | 89.6 | 87.6 | 85.4 | 84.4 |
| Final energy use - Industry (PJ)       | 236  | 243  | 246  | 249  | 254  | 253  | 258  |
| Final energy use - Residential (PJ)    | 123  | 118  | 114  | 110  | 103  | 94.4 | 86.6 |
| Final energy use - Transportation (PJ) | 324  | 305  | 276  | 255  | 238  | 219  | 197  |

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

| Item                                       | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|------|------|------|------|------|------|------|
| Residential HVAC investment in 2020s vs.   | 0    | 2.28 | 2.67 | 0    | 0    | 0    | 0    |
| REF - Cumulative 5-yr (billion \$2018)     |      |      |      |      |      |      |      |
| Sales of cooking units - Electric          | 52.5 | 53.8 | 58.1 | 69.6 | 85.5 | 95.3 | 98.7 |
| Resistance (%)                             |      |      |      |      |      |      |      |
| Sales of cooking units - Gas (%)           | 47.5 | 46.2 | 41.9 | 30.4 | 14.5 | 4.68 | 1.26 |
| Sales of space heating units - Electric    | 11.9 | 18.1 | 23.5 | 39   | 62.6 | 78   | 83.3 |
| Heat Pump (%)                              |      |      |      |      |      |      |      |
| Sales of space heating units - Electric    | 34.9 | 37.6 | 35.2 | 28.7 | 19   | 12.7 | 10.5 |
| Resistance (%)                             |      |      |      |      |      |      |      |
| Sales of space heating units - Fossil (%)  | 8.14 | 13.1 | 12.5 | 10.3 | 7.08 | 5.03 | 4.32 |
| Sales of space heating units - Gas (%)     | 45.1 | 31.2 | 28.8 | 22   | 11.3 | 4.24 | 1.82 |
| Sales of water heating units - Electric    | 0    | 1.94 | 7.45 | 23.3 | 47.7 | 63.6 | 69.1 |
| Heat Pump (%)                              |      |      |      |      |      |      |      |
| Sales of water heating units - Electric    | 44.5 | 55.7 | 53.5 | 47.1 | 37   | 30.5 | 28.2 |
| Resistance (%)                             |      |      |      |      |      |      |      |
| Sales of water heating units - Gas Furnace | 53.7 | 40.9 | 37.5 | 28.1 | 13.8 | 4.37 | 1.13 |
| (%)  |      |      |      |      |      |      |      |
| Sales of water heating units - Other (%)   | 1.86 | 1.52 | 1.52 | 1.51 | 1.52 | 1.5  | 1.5  |

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

| Item                                       | 2020  | 2025  | 2030  | 2035  | 2040  | 2045  | 2050  |
|--|-------|-------|-------|-------|-------|-------|-------|
| Light-duty vehicle capital costs -         | 0     | 0     | 86.7  | 184   | 621   | 1,961 | 2,854 |
| Cumulative 5-yr (million \$2018)           |       |       |       |       |       |       |       |
| Public EV charging plugs - DC Fast (1000   | 0.043 | 0     | 0.334 | 0     | 1.85  | 0     | 5.2   |
| units)                                     |       |       |       |       |       |       |       |
| Public EV charging plugs - L2 (1000 units) | 0.243 | 0     | 8.03  | 0     | 44.4  | 0     | 125   |
| Vehicle sales - Heavy-duty - diesel (%)    | 97.4  | 96    | 91.3  | 79.8  | 58.2  | 32.1  | 13.7  |
| Vehicle sales - Heavy-duty - EV (%)        | 0.498 | 1.45  | 4.11  | 10.8  | 23.6  | 39.5  | 51    |
| Vehicle sales - Heavy-duty - gasoline (%)  | 0.228 | 0.236 | 0.239 | 0.225 | 0.179 | 0.109 | 0.051 |
| Vehicle sales - Heavy-duty - hybrid (%)    | 0.083 | 0.094 | 0.104 | 0.107 | 0.092 | 0.06  | 0.03  |
| Vehicle sales - Heavy-duty - hydrogen FC   | 0.332 | 0.969 | 2.74  | 7.17  | 15.7  | 26.3  | 34    |
| (%)  |       |       |       |       |       |       |       |
| Vehicle sales - Heavy-duty - other (%)     | 1.5   | 1.28  | 1.46  | 1.95  | 2.25  | 1.96  | 1.14  |
| Vehicle sales - Light-duty - diesel (%)    | 1.82  | 2.19  | 2.11  | 1.69  | 1.1   | 0.572 | 0.244 |

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

| Item                                       | 2020  | 2025  | 2030  | 2035  | 2040  | 2045  | 2050  |
|--|-------|-------|-------|-------|-------|-------|-------|
| Vehicle sales - Light-duty - EV (%)        | 1.58  | 4.01  | 10.5  | 23.6  | 45.9  | 70.4  | 86.9  |
| Vehicle sales - Light-duty - gasoline (%)  | 92.7  | 88.7  | 81.8  | 69.5  | 49    | 26.6  | 11.7  |
| Vehicle sales - Light-duty - hybrid (%)    | 3.69  | 4.55  | 5.17  | 4.83  | 3.75  | 2.29  | 1.14  |
| Vehicle sales - Light-duty - hydrogen FC   | 0.113 | 0.388 | 0.341 | 0.266 | 0.193 | 0.109 | 0.05  |
| (%)  |       |       |       |       |       |       |       |
| Vehicle sales - Light-duty - other (%)     | 0.114 | 0.118 | 0.109 | 0.096 | 0.07  | 0.039 | 0.018 |
| Vehicle sales - Medium-duty - diesel (%)   | 64.8  | 62.2  | 57.7  | 49.4  | 35.6  | 19.6  | 8.37  |
| Vehicle sales - Medium-duty - EV (%)       | 0.664 | 1.94  | 5.49  | 14.3  | 31.4  | 52.6  | 68    |
| Vehicle sales - Medium-duty - gasoline (%) | 33.8  | 34.7  | 34.7  | 31.9  | 24.4  | 14.2  | 6.33  |
| Vehicle sales - Medium-duty - hybrid (%)   | 0.363 | 0.418 | 0.464 | 0.478 | 0.414 | 0.275 | 0.141 |
| Vehicle sales - Medium-duty - hydrogen     | 0.166 | 0.485 | 1.37  | 3.58  | 7.86  | 13.2  | 17    |
| FC (%)                                     |       |       |       |       |       |       |       |
| Vehicle sales - Medium-duty - other (%)    | 0.253 | 0.266 | 0.279 | 0.286 | 0.258 | 0.184 | 0.102 |

Table 22: E- scenario - PILLAR 6: Land sinks - Agriculture

| Item                                     | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050    |
|--|------|------|------|------|------|------|---------|
| Carbon sink potential - Aggressive       |      |      |      |      |      |      | -243    |
| deployment - Corn-ethanol to energy      |      |      |      |      |      |      |         |
| grasses (1000 tCO2e/y)                   |      |      |      |      |      |      |         |
| Carbon sink potential - Aggressive       |      |      |      |      |      |      | -10,076 |
| deployment - Cropland measures (1000     |      |      |      |      |      |      |         |
| tCO2e/y)                                 |      |      |      |      |      |      |         |
| Carbon sink potential - Aggressive       |      |      |      |      |      |      | -64.8   |
| deployment - Permanent conservation      |      |      |      |      |      |      |         |
| cover (1000 tCO2e/y)                     |      |      |      |      |      |      |         |
| Carbon sink potential - Aggressive       |      |      |      |      |      |      | -10,383 |
| deployment - Total (1000 tCO2e/y)        |      |      |      |      |      |      |         |
| Carbon sink potential - Moderate         |      |      |      |      |      |      | -243    |
| deployment - Corn-ethanol to energy      |      |      |      |      |      |      |         |
| grasses (1000 tCO2e/y)                   |      |      |      |      |      |      |         |
| Carbon sink potential - Moderate         |      |      |      |      |      |      | -5,130  |
| deployment - Cropland measures (1000     |      |      |      |      |      |      |         |
| tCO2e/y)                                 |      |      |      |      |      |      |         |
| Carbon sink potential - Moderate         |      |      |      |      |      |      | -32.4   |
| deployment - Permanent conservation      |      |      |      |      |      |      |         |
| cover (1000 tCO2e/y)                     |      |      |      |      |      |      |         |
| Carbon sink potential - Moderate         |      |      |      |      |      |      | -5,405  |
| deployment - Total (1000 tCO2e/y)        |      |      |      |      |      |      |         |
| Land impacted for carbon sink -          |      |      |      |      |      |      | 96.4    |
| Aggressive deployment - Corn-ethanol to  |      |      |      |      |      |      |         |
| energy grasses (1000 hectares)           |      |      |      |      |      |      |         |
| Land impacted for carbon sink -          |      |      |      |      |      |      | 2,955   |
| Aggressive deployment - Cropland         |      |      |      |      |      |      |         |
| measures (1000 hectares)                 |      |      |      |      |      |      |         |
| Land impacted for carbon sink -          |      |      |      |      |      |      | 118     |
| Aggressive deployment - Permanent        |      |      |      |      |      |      |         |
| conservation cover (1000 hectares)       |      |      |      |      |      |      |         |
| Land impacted for carbon sink -          |      |      |      |      |      |      | 3,170   |
| Aggressive deployment - Total (1000      |      |      |      |      |      |      |         |
| hectares)                                |      |      |      |      |      |      |         |
| Land impacted for carbon sink - Moderate |      |      |      |      |      |      | 96.4    |
| deployment - Corn-ethanol to energy      |      |      |      |      |      |      |         |
| grasses (1000 hectares)                  |      |      |      |      |      |      |         |
| Land impacted for carbon sink - Moderate |      |      |      |      |      |      | 1,507   |
| deployment - Cropland measures (1000     |      |      |      |      |      |      |         |
| hectares)                                |      |      |      |      |      |      |         |
| Land impacted for carbon sink - Moderate |      |      |      |      |      |      | 58.9    |
| deployment - Permanent conservation      |      |      |      |      |      |      |         |
| cover (1000 hectares)                    |      |      |      |      |      |      |         |

Table 22: E- scenario - PILLAR 6: Land sinks - Agriculture (continued)

|  | -    | •    | -    |      |      |      |       |
|--|------|------|------|------|------|------|-------|
| Item                                     | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050  |
| Land impacted for carbon sink - Moderate |      |      |      |      |      |      | 1,662 |
| deployment - Total (1000 hectares)       |      |      |      |      |      |      |       |

### Table 23: E- scenario - PILLAR 6: Land sinks - Forests

| Item                                      | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050    |
|---|------|------|------|------|------|------|---------|
| Carbon sink potential - High - Accelerate |      |      |      |      |      |      | -356    |
| regeneration (1000 tC02e/y)               |      |      |      |      |      |      |         |
| Carbon sink potential - High - All (not   |      |      |      |      |      |      | -46,154 |
| counting overlap) (1000 tC02e/y)          |      |      |      |      |      |      |         |
| Carbon sink potential - High - Avoid      |      |      |      |      |      |      | -1,334  |
| deforestation (1000 tC02e/y)              |      |      |      |      |      |      |         |
| Carbon sink potential - High - Extend     |      |      |      |      |      |      | -9,227  |
| rotation length (1000 tCO2e/y)            |      |      |      |      |      |      |         |
| Carbon sink potential - High - Improve    |      |      |      |      |      |      | -3,044  |
| plantations (1000 tCO2e/y)                |      |      |      |      |      |      |         |
| Carbon sink potential - High - Increase   |      |      |      |      |      |      | -13,825 |
| retention of HWP (1000 tCO2e/y)           |      |      |      |      |      |      |         |
| Carbon sink potential - High - Increase   |      |      |      |      |      |      | -1,120  |
| trees outside forests (1000 tCO2e/y)      |      |      |      |      |      |      |         |
| Carbon sink potential - High - Reforest   |      |      |      |      |      |      | -1,077  |
| cropland (1000 tCO2e/y)                   |      |      |      |      |      |      |         |
| Carbon sink potential - High - Reforest   |      |      |      |      |      |      | -11,526 |
| pasture (1000 tCO2e/y)                    |      |      |      |      |      |      |         |
| Carbon sink potential - High - Restore    |      |      |      |      |      |      | -4,644  |
| productivity (1000 tCO2e/y)               |      |      |      |      |      |      |         |
| Carbon sink potential - Low - Accelerate  |      |      |      |      |      |      | -178    |
| regeneration (1000 tCO2e/y)               |      |      |      |      |      |      |         |
| Carbon sink potential - Low - All (not    |      |      |      |      |      |      | -13,471 |
| counting overlap) (1000 tCO2e/y)          |      |      |      |      |      |      |         |
| Carbon sink potential - Low - Avoid       |      |      |      |      |      |      | -222    |
| deforestation (1000 tC02e/y)              |      |      |      |      |      |      |         |
| Carbon sink potential - Low - Extend      |      | +    |      |      |      |      | -3,544  |
| rotation length (1000 tCO2e/y)            |      |      |      |      |      |      | 0,011   |
| Carbon sink potential - Low - Improve     |      |      |      |      |      |      | -1,549  |
| plantations (1000 tCO2e/y)                |      |      |      |      |      |      | 1,047   |
| Carbon sink potential - Low - Increase    |      |      |      |      |      |      | -4,608  |
| retention of HWP (1000 tC02e/y)           |      |      |      |      |      |      | -4,000  |
| Carbon sink potential - Low - Increase    |      |      |      |      |      |      | -392    |
| trees outside forests (1000 tC02e/y)      |      |      |      |      |      |      | -372    |
| , , , , ,                                 |      |      |      |      |      |      | F20     |
| Carbon sink potential - Low - Reforest    |      |      |      |      |      |      | -538    |
| cropland (1000 tCO2e/y)                   |      |      |      |      |      |      | 070     |
| Carbon sink potential - Low - Reforest    |      |      |      |      |      |      | -873    |
| pasture (1000 tCO2e/y)                    |      |      |      |      |      |      | 45/5    |
| Carbon sink potential - Low - Restore     |      |      |      |      |      |      | -1,565  |
| productivity (1000 tC02e/y)               |      |      |      |      |      |      |         |
| Carbon sink potential - Mid - Accelerate  |      |      |      |      |      |      | -267    |
| regeneration (1000 tCO2e/y)               |      |      |      |      |      |      |         |
| Carbon sink potential - Mid - All (not    |      |      |      |      |      |      | -29,786 |
| counting overlap) (1000 tCO2e/y)          |      |      |      |      |      |      |         |
| Carbon sink potential - Mid - Avoid       |      |      |      |      |      |      | -778    |
| deforestation (1000 tCO2e/y)              |      |      |      |      |      |      |         |
| Carbon sink potential - Mid - Extend      |      |      |      |      |      |      | -6,386  |
| rotation length (1000 tCO2e/y)            |      |      |      |      |      |      |         |
| Carbon sink potential - Mid - Improve     |      |      |      |      |      |      | -2,270  |
| plantations (1000 tCO2e/y)                |      |      |      |      |      |      |         |
| Carbon sink potential - Mid - Increase    |      |      |      |      |      |      | -9,217  |
| retention of HWP (1000 tCO2e/y)           |      |      |      |      |      |      |         |
| Carbon sink potential - Mid - Increase    |      |      |      |      |      |      | -756    |
| trees outside forests (1000 tCO2e/y)      |      |      |      |      |      |      |         |

Table 23: E- scenario - PILLAR 6: Land sinks - Forests (continued)

| Item   | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050   |
|--|------|------|------|------|------|------|--------|
| Carbon sink potential - Mid - Reforest   |      |      |      |      |      |      | -807   |
| cropland (1000 tCO2e/y)  |      |      |      |      |      |      | ( 000  |
| Carbon sink potential - Mid - Reforest   |      |      |      |      |      |      | -6,200 |
| pasture (1000 tC02e/y) Carbon sink potential - Mid - Restore   |      |      |      |      |      |      | 0.105  |
| ·  |      |      |      |      |      |      | -3,105 |
| productivity (1000 tC02e/y)  |      |      |      |      |      |      | 58.3   |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 58.3   |
| High - Accelerate regeneration (1000   |      |      |      |      |      |      |        |
| hectares)  |      |      |      |      |      |      | 101    |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 181    |
| High - Avoid deforestation (over 30 years)   |      |      |      |      |      |      |        |
| (1000 hectares)  |      |      |      |      |      |      | , 705  |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 4,705  |
| High - Extend rotation length (1000  |      |      |      |      |      |      |        |
| hectares)  |      |      |      |      |      |      |        |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 1,121  |
| 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 -  |      |      |      |      |      |      | 106    |
| High - Increase trees outside forests  |      |      |      |      |      |      |        |
| (1000 hectares)  |      |      |      |      |      |      |        |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 71.2   |
| High - Reforest cropland (1000 hectares)   |      |      |      |      |      |      |        |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 327    |
| High - Reforest pasture (1000 hectares)  |      |      |      |      |      |      |        |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 1,539  |
| High - Restore productivity (1000  |      |      |      |      |      |      | .,007  |
| hectares)  |      |      |      |      |      |      |        |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 8,110  |
| High - Total impacted (over 30 years)  |      |      |      |      |      |      | 0,110  |
| (1000 hectares)  |      |      |      |      |      |      |        |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 29.1   |
| Low - Accelerate regeneration (1000  |      |      |      |      |      |      | 27.1   |
| hectares)  |      |      |      |      |      |      |        |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 170    |
| The state of the s |      |      |      |      |      |      | 170    |
| Low - Avoid deforestation (over 30 years)  |      |      |      |      |      |      |        |
| (1000 hectares)  |      |      |      |      |      |      | 1.000  |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 1,803  |
| Low - Extend rotation length (1000   |      |      |      |      |      |      |        |
| hectares)  |      |      |      |      |      |      |        |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 561    |
| 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 -  |      |      |      |      |      |      | 56     |
| Low - Increase trees outside forests   |      |      |      |      |      |      |        |
| (1000 hectares)  |      |      |      |      |      |      |        |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 35.6   |
| Low - Reforest cropland (1000 hectares)  |      |      |      |      |      |      |        |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 56.8   |
| Low - Reforest pasture (1000 hectares)   |      |      |      |      |      |      | 55.5   |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 931    |
|  |      |      |      |      |      |      | /51    |
| Low - Restore productivity (1000   |      | ,    |      |      |      |      |        |

Table 23: E- scenario - PILLAR 6: Land sinks - Forests (continued)

| Item                                       | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050  |
|--|------|------|------|------|------|------|-------|
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 3,642 |
| Low - Total impacted (over 30 years)       |      |      |      |      |      |      |       |
| (1000 hectares)                            |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 43.7  |
| Mid - Accelerate regeneration (1000        |      |      |      |      |      |      |       |
| hectares)                                  |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 175   |
| Mid - Avoid deforestation (over 30 years)  |      |      |      |      |      |      |       |
| (1000 hectares)                            |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 3,254 |
| Mid - Extend rotation length (1000         |      |      |      |      |      |      |       |
| hectares)                                  |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 844   |
| 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 -  |      |      |      |      |      |      | 81.2  |
| Mid - Increase trees outside forests (1000 |      |      |      |      |      |      |       |
| hectares)                                  |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 53.4  |
| Mid - Reforest cropland (1000 hectares)    |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 410   |
| Mid - Reforest pasture (1000 hectares)     |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 1,876 |
| Mid - Restore productivity (1000           |      |      |      |      |      |      |       |
| hectares)                                  |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 6,737 |
| Mid - Total impacted (over 30 years) (1000 |      |      |      |      |      |      |       |
| hectares)                                  |      |      |      |      |      |      |       |

### Table 24: E- scenario - IMPACTS - Health

| Item   | 2020 | 2025 | 2030  | 2035  | 2040  | 2045  | 2050  |
|--|------|------|-------|-------|-------|-------|-------|
| Monetary damages from air pollution -                                    |      | 319  | 0.217 | 0.206 | 0.16  | 0.104 | 0.004 |
| Coal (million 2019\$)  |      | 110  | 54    | 25    | 11.9  | 4.22  | 3.25  |
| Monetary damages from air pollution -<br>Natural Gas (million 2019\$)    |      | 110  | 54    | 25    | 11.9  | 4.22  | 3.25  |
| Monetary damages from air pollution -<br>Transportation (million 2019\$) |      | 410  | 410   | 397   | 357   | 283   | 194   |
| Premature deaths from air pollution -<br>Coal (deaths)                   |      | 36   | 0.024 | 0.023 | 0.018 | 0.012 | 0     |
| Premature deaths from air pollution -<br>Natural Gas (deaths)            |      | 12.4 | 6.1   | 2.82  | 1.34  | 0.476 | 0.367 |
| Premature deaths from air pollution -<br>Transportation (deaths)         |      | 46.1 | 46.1  | 44.7  | 40.1  | 31.8  | 21.8  |

Table 25: E+RE+ scenario - PILLAR 1: Efficiency/Electrification - Commercial

| Item                                      | 2020 | 2025   | 2030   | 2035 | 2040 | 2045 | 2050 |
|---|------|--------|--------|------|------|------|------|
| Commercial HVAC investment in 2020s -     | 0    | 10,539 | 12,307 | 0    | 0    | 0    | 0    |
| Cumulative 5-yr (million \$2018)          |      |        |        |      |      |      |      |
| Sales of cooking units - Electric         | 30.1 | 44.4   | 79.2   | 86.1 | 86.5 | 86.5 | 86.5 |
| Resistance (%)                            |      |        |        |      |      |      |      |
| Sales of cooking units - Gas (%)          | 69.9 | 55.6   | 20.8   | 13.9 | 13.5 | 13.5 | 13.5 |
| Sales of space heating units - Electric   | 2.92 | 27.3   | 77.1   | 91.1 | 92.3 | 92.3 | 92.3 |
| Heat Pump (%)                             |      |        |        |      |      |      |      |
| Sales of space heating units - Electric   | 2.74 | 4.44   | 4.73   | 6.05 | 6.35 | 6.37 | 6.39 |
| Resistance (%)                            |      |        |        |      |      |      |      |
| Sales of space heating units - Fossil (%) | 0    | 0      | 0      | 0    | 0    | 0    | 0    |

| Table 25: <i>E+RE+</i> | scenario - | PTIIAR 1. | Efficiency/ | Flectrification - | Commercial | (continued) |
|------------------------|------------|-----------|-------------|-------------------|------------|-------------|
|                        |            |           |             |                   |            |             |

| Item  | 2020 | 2025 | 2030 | 2035  | 2040 | 2045 | 2050 |
|---|------|------|------|-------|------|------|------|
| Sales of space heating units - Gas Furnace (%)            | 94.3 | 68.3 | 18.2 | 2.83  | 1.38 | 1.34 | 1.33 |
| Sales of water heating units - Electric<br>Heat Pump (%)  | 0.08 | 10.7 | 56.3 | 66.5  | 66.9 | 66.9 | 66.9 |
| Sales of water heating units - Electric<br>Resistance (%) | 2.31 | 8.07 | 26.9 | 31.1  | 31.3 | 31.3 | 31.3 |
| Sales of water heating units - Gas Furnace (%)            | 96.5 | 79.4 | 15   | 0.632 | 0    | 0    | 0    |
| Sales of water heating units - Other (%)                  | 1.07 | 1.78 | 1.78 | 1.78  | 1.79 | 1.79 | 1.8  |

# Table 26: E+RE+ scenario - PILLAR 1: Efficiency/Electrification - Electricity demand

| Item  | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|------|------|------|------|------|------|------|
| Electricity distribution capital invested - |      | 2.42 | 2.48 | 3.87 | 4.09 | 4.01 | 4.2  |
| Cumulative 5-yr (billion \$2018)            |      |      |      |      |      |      |      |

### Table 27: E+RE+ scenario - PILLAR 1: Efficiency/Electrification - Overview

| Item                                   | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|------|------|------|------|------|------|------|
| Final energy use - Commercial (PJ)     | 90   | 90.4 | 87   | 81.6 | 77.4 | 76.4 | 78.1 |
| Final energy use - Industry (PJ)       | 236  | 242  | 246  | 246  | 250  | 250  | 255  |
| Final energy use - Residential (PJ)    | 123  | 117  | 108  | 95.6 | 85.1 | 78.9 | 76.1 |
| Final energy use - Transportation (PJ) | 324  | 303  | 265  | 220  | 179  | 155  | 146  |

### Table 28: E+RE+ scenario - PILLAR 1: Efficiency/Electrification - Residential

| Item                                       | 2020 | 2025 | 2030 | 2035  | 2040  | 2045  | 2050  |
|--|------|------|------|-------|-------|-------|-------|
| Residential HVAC investment in 2020s vs.   | 0    | 2.31 | 2.82 | 0     | 0     | 0     | 0     |
| REF - Cumulative 5-yr (billion \$2018)     |      |      |      |       |       |       |       |
| Sales of cooking units - Electric          | 52.7 | 62.8 | 93.6 | 99.7  | 100   | 100   | 100   |
| Resistance (%)                             |      |      |      |       |       |       |       |
| Sales of cooking units - Gas (%)           | 47.3 | 37.2 | 6.37 | 0.321 | 0     | 0     | 0     |
| Sales of space heating units - Electric    | 11.9 | 27.2 | 74.3 | 84.8  | 85.3  | 85.2  | 85.2  |
| Heat Pump (%)                              |      |      |      |       |       |       |       |
| Sales of space heating units - Electric    | 34.9 | 33.8 | 14.2 | 9.82  | 9.65  | 9.82  | 9.86  |
| Resistance (%)                             |      |      |      |       |       |       |       |
| Sales of space heating units - Fossil (%)  | 8.14 | 11.9 | 5.59 | 4.18  | 4.11  | 4.04  | 4.03  |
| Sales of space heating units - Gas (%)     | 45.1 | 27.1 | 5.9  | 1.18  | 0.978 | 0.957 | 0.954 |
| Sales of water heating units - Electric    | 0    | 11.3 | 59.7 | 70.6  | 71.1  | 71.1  | 71.1  |
| Heat Pump (%)                              |      |      |      |       |       |       |       |
| Sales of water heating units - Electric    | 44.5 | 51.9 | 32.1 | 27.6  | 27.4  | 27.4  | 27.4  |
| Resistance (%)                             |      |      |      |       |       |       |       |
| Sales of water heating units - Gas Furnace | 53.7 | 35.3 | 6.65 | 0.277 | 0     | 0     | 0     |
| (%)  |      |      |      |       |       |       |       |
| Sales of water heating units - Other (%)   | 1.86 | 1.52 | 1.52 | 1.49  | 1.49  | 1.5   | 1.5   |

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

| Item                                       | 2020  | 2025  | 2030  | 2035  | 2040  | 2045  | 2050  |
|--|-------|-------|-------|-------|-------|-------|-------|
| Light-duty vehicle capital costs -         | 0     | 542   | 1,384 | 2,253 | 3,409 | 3,714 | 3,539 |
| Cumulative 5-yr (million \$2018)           |       |       |       |       |       |       |       |
| Public EV charging plugs - DC Fast (1000   | 0.043 | 0     | 1.12  | 0     | 5.01  | 0     | 8.11  |
| units)                                     |       |       |       |       |       |       |       |
| Public EV charging plugs - L2 (1000 units) | 0.243 | 0     | 26.9  | 0     | 120   | 0     | 195   |
| Vehicle sales - Heavy-duty - diesel (%)    | 97.2  | 92.1  | 67    | 23.3  | 4.22  | 0.628 | 0     |
| Vehicle sales - Heavy-duty - EV (%)        | 0.588 | 3.81  | 19    | 45.6  | 57.4  | 59.6  | 60    |
| Vehicle sales - Heavy-duty - gasoline (%)  | 0.227 | 0.227 | 0.176 | 0.066 | 0.013 | 0.002 | 0     |
| Vehicle sales - Heavy-duty - hybrid (%)    | 0.082 | 0.09  | 0.077 | 0.031 | 0.007 | 0.001 | 0     |
| Vehicle sales - Heavy-duty - hydrogen FC   | 0.392 | 2.54  | 12.7  | 30.4  | 38.2  | 39.7  | 40    |
| (%)  |       |       |       |       |       |       |       |

| Table 29: E+RE+ scena  | nio DILLAD 1. Efficience     | v/Electrification         | Transportation | (nontinued) |
|------------------------|------------------------------|---------------------------|----------------|-------------|
| Table 29. E+RE+ Scellu | II IU - PILLAR I. EIIIUIEIIU | : 7/ = 12011 1110011011 - | Trunsbortution | COMUNICEUM  |

| Item                                       | 2020  | 2025  | 2030  | 2035  | 2040  | 2045  | 2050 |
|--|-------|-------|-------|-------|-------|-------|------|
| Vehicle sales - Heavy-duty - other (%)     | 1.5   | 1.23  | 1.07  | 0.568 | 0.163 | 0.038 | 0    |
| Vehicle sales - Light-duty - diesel (%)    | 1.81  | 2.04  | 1.36  | 0.439 | 0.079 | 0.013 | 0    |
| Vehicle sales - Light-duty - EV (%)        | 3.04  | 12.5  | 42.3  | 80.1  | 96.1  | 99.3  | 100  |
| Vehicle sales - Light-duty - gasoline (%)  | 91.3  | 81    | 53.1  | 18.2  | 3.51  | 0.597 | 0    |
| Vehicle sales - Light-duty - hybrid (%)    | 3.57  | 3.93  | 2.92  | 1.11  | 0.266 | 0.056 | 0    |
| Vehicle sales - Light-duty - hydrogen FC   | 0.112 | 0.354 | 0.224 | 0.071 | 0.014 | 0.002 | 0    |
| (%)  |       |       |       |       |       |       |      |
| Vehicle sales - Light-duty - other (%)     | 0.113 | 0.11  | 0.074 | 0.026 | 0.005 | 0.001 | 0    |
| Vehicle sales - Medium-duty - diesel (%)   | 64.7  | 59.7  | 42.3  | 14.4  | 2.59  | 0.384 | 0    |
| Vehicle sales - Medium-duty - EV (%)       | 0.784 | 5.07  | 25.3  | 60.8  | 76.5  | 79.5  | 80   |
| Vehicle sales - Medium-duty - gasoline (%) | 33.7  | 33.3  | 25.5  | 9.32  | 1.77  | 0.277 | 0    |
| Vehicle sales - Medium-duty - hybrid (%)   | 0.363 | 0.402 | 0.341 | 0.14  | 0.03  | 0.005 | 0    |
| Vehicle sales - Medium-duty - hydrogen     | 0.196 | 1.27  | 6.33  | 15.2  | 19.1  | 19.9  | 20   |
| FC (%)                                     |       |       |       |       |       |       |      |
| Vehicle sales - Medium-duty - other (%)    | 0.253 | 0.255 | 0.205 | 0.083 | 0.019 | 0.004 | 0    |

# Table 30: E+RE+ scenario - PILLAR 2: Clean Electricity - Generating capacity

| Item  | 2020 | 2025  | 2030  | 2035   | 2040   | 2045   | 2050    |
|---|------|-------|-------|--------|--------|--------|---------|
| Capital invested - Solar PV - Base (billion \$2018)                       | 0    | 0.463 | 3.64  | 3.66   | 3.27   | 10.3   | 9.23    |
| Capital invested - Wind - Base (billion<br>\$2018)                        | 0    | 3.54  | 8.66  | 17.5   | 15.8   | 25.6   | 45.4    |
| Installed (cumulative) - OffshoreWind -<br>Base land use assumptions (MW) | 0    | 0     | 0     | 0      | 0      | 0      | 0       |
| Installed (cumulative) - Solar - Base land use assumptions (MW)           | 179  | 525   | 3,561 | 6,876  | 10,017 | 20,475 | 30,434  |
| Installed (cumulative) - Wind - Base land use assumptions (MW)            | 84.5 | 2,493 | 8,997 | 23,141 | 36,480 | 59,292 | 102,194 |

# Table 31: E+RE+ scenario - PILLAR 2: Clean Electricity - Generation

| Item   | 2020  | 2025   | 2030   | 2035   | 2040   | 2045   | 2050    |
|--|-------|--------|--------|--------|--------|--------|---------|
| Solar - Base land use assumptions (GWh)        | 409   | 658    | 5,790  | 6,349  | 5,998  | 19,976 | 18,926  |
| Solar - Constrained land use assumptions (GWh) | 409   | 1,781  | 2,296  | 5,518  | 7,435  | 24,374 | 24,110  |
| Wind - Base land use assumptions (GWh)         | 315   | 8,107  | 21,440 | 46,708 | 41,293 | 68,635 | 118,691 |
| Wind - Constrained land use assumptions (GWh)  | 1,989 | 18,247 | 29,786 | 71,941 | 51,853 | 8,742  | 138,685 |

# Table 32: E+RE+ scenario - PILLAR 6: Land sinks - Agriculture

| Item                                 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050    |
|--------------------------------------|------|------|------|------|------|------|---------|
| Carbon sink potential - Aggressive   |      |      |      |      |      |      | -243    |
| deployment - Corn-ethanol to energy  |      |      |      |      |      |      |         |
| grasses (1000 tCO2e/y)               |      |      |      |      |      |      |         |
| Carbon sink potential - Aggressive   |      |      |      |      |      |      | -10,076 |
| deployment - Cropland measures (1000 |      |      |      |      |      |      |         |
| tCO2e/y)                             |      |      |      |      |      |      |         |
| Carbon sink potential - Aggressive   |      |      |      |      |      |      | -64.8   |
| deployment - Permanent conservation  |      |      |      |      |      |      |         |
| cover (1000 tCO2e/y)                 |      |      |      |      |      |      |         |
| Carbon sink potential - Aggressive   |      |      |      |      |      |      | -10,383 |
| deployment - Total (1000 tCO2e/y)    |      |      |      |      |      |      |         |
| Carbon sink potential - Moderate     |      |      |      |      |      |      | -243    |
| deployment - Corn-ethanol to energy  |      |      |      |      |      |      |         |
| grasses (1000 tC02e/y)               |      |      |      |      |      |      |         |
| Carbon sink potential - Moderate     |      |      |      |      |      |      | -5,130  |
| deployment - Cropland measures (1000 |      |      |      |      |      |      |         |
| tCO2e/y)                             |      |      |      |      |      |      |         |

Table 32: E+RE+ scenario - PILLAR 6: Land sinks - Agriculture (continued)

| Item                                     | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050   |
|--|------|------|------|------|------|------|--------|
| Carbon sink potential - Moderate         |      |      |      |      |      |      | -32.4  |
| deployment - Permanent conservation      |      |      |      |      |      |      |        |
| cover (1000 tCO2e/y)                     |      |      |      |      |      |      |        |
| Carbon sink potential - Moderate         |      |      |      |      |      |      | -5,405 |
| deployment - Total (1000 tCO2e/y)        |      |      |      |      |      |      |        |
| Land impacted for carbon sink -          |      |      |      |      |      |      | 96.4   |
| Aggressive deployment - Corn-ethanol to  |      |      |      |      |      |      |        |
| energy grasses (1000 hectares)           |      |      |      |      |      |      |        |
| Land impacted for carbon sink -          |      |      |      |      |      |      | 2,955  |
| Aggressive deployment - Cropland         |      |      |      |      |      |      |        |
| measures (1000 hectares)                 |      |      |      |      |      |      |        |
| Land impacted for carbon sink -          |      |      |      |      |      |      | 118    |
| Aggressive deployment - Permanent        |      |      |      |      |      |      |        |
| conservation cover (1000 hectares)       |      |      |      |      |      |      |        |
| Land impacted for carbon sink -          |      |      |      |      |      |      | 3,170  |
| Aggressive deployment - Total (1000      |      |      |      |      |      |      |        |
| hectares)                                |      |      |      |      |      |      |        |
| Land impacted for carbon sink - Moderate |      |      |      |      |      |      | 96.4   |
| deployment - Corn-ethanol to energy      |      |      |      |      |      |      |        |
| grasses (1000 hectares)                  |      |      |      |      |      |      |        |
| Land impacted for carbon sink - Moderate |      |      |      |      |      |      | 1,507  |
| deployment - Cropland measures (1000     |      |      |      |      |      |      |        |
| hectares)                                |      |      |      |      |      |      |        |
| Land impacted for carbon sink - Moderate |      |      |      |      |      |      | 58.9   |
| deployment - Permanent conservation      |      |      |      |      |      |      |        |
| cover (1000 hectares)                    |      |      |      |      |      |      |        |
| Land impacted for carbon sink - Moderate |      |      |      |      |      |      | 1,662  |
| deployment - Total (1000 hectares)       |      |      |      |      |      |      |        |

Table 33: E+RE+ scenario - PILLAR 6: Land sinks - Forests

| Item   | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050    |
|--|------|------|------|------|------|------|---------|
| Carbon sink potential - High - Accelerate regeneration (1000 tCO2e/y)        |      |      |      |      |      |      | -356    |
| Carbon sink potential - High - All (not counting overlap) (1000 tC02e/y)     |      |      |      |      |      |      | -46,154 |
| Carbon sink potential - High - Avoid deforestation (1000 tCO2e/y)            |      |      |      |      |      |      | -1,334  |
| Carbon sink potential - High - Extend rotation length (1000 tCO2e/y)         |      |      |      |      |      |      | -9,227  |
| Carbon sink potential - High - Improve plantations (1000 tCO2e/y)            |      |      |      |      |      |      | -3,044  |
| Carbon sink potential - High - Increase retention of HWP (1000 tC02e/y)      |      |      |      |      |      |      | -13,825 |
| Carbon sink potential - High - Increase trees outside forests (1000 tC02e/y) |      |      |      |      |      |      | -1,120  |
| Carbon sink potential - High - Reforest cropland (1000 tCO2e/y)              |      |      |      |      |      |      | -1,077  |
| Carbon sink potential - High - Reforest pasture (1000 tCO2e/y)               |      |      |      |      |      |      | -11,526 |
| Carbon sink potential - High - Restore productivity (1000 tC02e/y)           |      |      |      |      |      |      | -4,644  |
| Carbon sink potential - Low - Accelerate regeneration (1000 tC02e/y)         |      |      |      |      |      |      | -178    |
| Carbon sink potential - Low - All (not counting overlap) (1000 tC02e/y)      |      |      |      |      |      |      | -13,471 |
| Carbon sink potential - Low - Avoid deforestation (1000 tC02e/y)             |      |      |      |      |      |      | -222    |
| Carbon sink potential - Low - Extend rotation length (1000 tCO2e/y)          |      |      |      |      |      |      | -3,544  |

Table 33: E+RE+ scenario - PILLAR 6: Land sinks - Forests (continued)

| Item  | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050    |
|---|------|------|------|------|------|------|---------|
| Carbon sink potential - Low - Improve                                       |      |      |      |      |      |      | -1,549  |
| plantations (1000 tCO2e/y)  |      |      |      |      |      |      | 1.404   |
| Carbon sink potential - Low - Increase                                      |      |      |      |      |      |      | -4,608  |
| retention of HWP (1000 tC02e/y)   |      |      |      |      |      |      | 200     |
| Carbon sink potential - Low - Increase trees outside forests (1000 tC02e/y) |      |      |      |      |      |      | -39:    |
| Carbon sink potential - Low - Reforest                                      |      |      |      |      |      |      | -538    |
|   |      |      |      |      |      |      | -538    |
| cropland (1000 tC02e/y)   |      |      |      |      |      |      | -873    |
| Carbon sink potential - Low - Reforest pasture (1000 tCO2e/y)               |      |      |      |      |      |      | -07     |
| Carbon sink potential - Low - Restore                                       |      |      |      |      |      |      | 1 5 / 1 |
| productivity (1000 tCO2e/y)   |      |      |      |      |      |      | -1,56   |
| Carbon sink potential - Mid - Accelerate                                    |      |      |      |      |      |      | -26     |
| regeneration (1000 tCO2e/y)   |      |      |      |      |      |      | -20     |
| Carbon sink potential - Mid - All (not                                      |      |      |      |      |      |      | -29,78  |
| counting overlap) (1000 tC02e/y)  |      |      |      |      |      |      | -29,100 |
| Carbon sink potential - Mid - Avoid   |      |      |      |      |      |      | -77     |
| deforestation (1000 tC02e/y)  |      |      |      |      |      |      | -111    |
| Carbon sink potential - Mid - Extend  |      |      |      |      |      |      | -6,38   |
| rotation length (1000 tC02e/y)  |      |      |      |      |      |      | -0,30   |
| Carbon sink potential - Mid - Improve                                       |      |      |      |      |      |      | -2,270  |
| plantations (1000 tCO2e/y)  |      |      |      |      |      |      | -2,21   |
| Carbon sink potential - Mid - Increase                                      |      |      |      |      |      |      | -9,21   |
| retention of HWP (1000 tC02e/y)   |      |      |      |      |      |      | -9,21   |
| Carbon sink potential - Mid - Increase                                      |      |      |      |      |      |      | -75     |
| trees outside forests (1000 tCO2e/y)  |      |      |      |      |      |      | -13     |
| Carbon sink potential - Mid - Reforest                                      |      |      |      |      |      |      | -80     |
| cropland (1000 tCO2e/y)   |      |      |      |      |      |      | -00     |
| Carbon sink potential - Mid - Reforest                                      |      |      |      |      |      |      | -6,20   |
| pasture (1000 tC02e/y)  |      |      |      |      |      |      | -0,20   |
| Carbon sink potential - Mid - Restore                                       |      |      |      |      |      |      | -3,10   |
| productivity (1000 tC02e/y)   |      |      |      |      |      |      | -3,10   |
| Land impacted for carbon sink potential -                                   |      |      |      |      |      |      | 58.     |
| High - Accelerate regeneration (1000  |      |      |      |      |      |      | 50.     |
| hectares)   |      |      |      |      |      |      |         |
| Land impacted for carbon sink potential -                                   |      |      |      |      |      |      | 18      |
| High - Avoid deforestation (over 30 years)                                  |      |      |      |      |      |      | 10      |
| (1000 hectares)   |      |      |      |      |      |      |         |
| Land impacted for carbon sink potential -                                   |      |      |      |      |      |      | 4,70    |
| High - Extend rotation length (1000   |      |      |      |      |      |      | 4,10    |
| hectares)   |      |      |      |      |      |      |         |
| Land impacted for carbon sink potential -                                   |      |      |      |      |      |      | 1,12    |
| High - Improve plantations (1000  |      |      |      |      |      |      | 1,12    |
| hectares)   |      |      |      |      |      |      |         |
| Land impacted for carbon sink potential -                                   |      |      |      |      |      |      |         |
| High - Increase retention of HWP (1000                                      |      |      |      |      |      |      | ,       |
| hectares)   |      |      |      |      |      |      |         |
| Land impacted for carbon sink potential -                                   |      |      |      |      |      |      | 10      |
| High - Increase trees outside forests                                       |      |      |      |      |      |      | 10      |
| (1000 hectares)   |      |      |      |      |      |      |         |
| Land impacted for carbon sink potential -                                   |      |      |      |      |      |      | 71.     |
| High - Reforest cropland (1000 hectares)                                    |      |      |      |      |      |      | 11.     |
| Land impacted for carbon sink potential -                                   |      |      |      |      |      |      | 32      |
| High - Reforest pasture (1000 hectares)                                     |      |      |      |      |      |      | 32      |
| Land impacted for carbon sink potential -                                   |      |      |      |      |      |      | 1,53    |
| High - Restore productivity (1000   |      |      |      |      |      |      | 1,53    |
| hectares)   |      |      |      |      |      |      |         |
| -   |      |      |      |      |      |      | 0 11    |
| Land impacted for carbon sink potential -                                   |      |      |      |      |      |      | 8,110   |
| High - Total impacted (over 30 years)                                       |      |      |      |      |      |      |         |

Table 33: E+RE+ scenario - PILLAR 6: Land sinks - Forests (continued)

| Item                                       | 2020   | 2025      | 2030 | 2035 | 2040 | 2045 | 2050  |
|--|--------|-----------|------|------|------|------|-------|
| Land impacted for carbon sink potential -  | 2020   | 2023      | 2030 | 2033 | 2040 | 2045 | 2030  |
| Low - Accelerate regeneration (1000        |        |           |      |      |      |      | ۷,1   |
| hectares)                                  |        |           |      |      |      |      |       |
| Land impacted for carbon sink potential -  |        |           |      |      |      |      | 170   |
|  |        |           |      |      |      |      | 170   |
| Low - Avoid deforestation (over 30 years)  |        |           |      |      |      |      |       |
| (1000 hectares)                            |        |           |      |      |      |      | 1.000 |
| Land impacted for carbon sink potential -  |        |           |      |      |      |      | 1,803 |
| Low - Extend rotation length (1000         |        |           |      |      |      |      |       |
| hectares)                                  |        |           |      |      |      |      |       |
| Land impacted for carbon sink potential -  |        |           |      |      |      |      | 561   |
| 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 -  |        |           |      |      |      |      | 56    |
| Low - Increase trees outside forests       |        |           |      |      |      |      |       |
| (1000 hectares)                            |        |           |      |      |      |      |       |
| Land impacted for carbon sink potential -  |        |           |      |      |      |      | 35.6  |
| Low - Reforest cropland (1000 hectares)    |        |           |      |      |      |      |       |
| Land impacted for carbon sink potential -  |        |           |      |      |      |      | 56.8  |
| Low - Reforest pasture (1000 hectares)     |        |           |      |      |      |      |       |
| Land impacted for carbon sink potential -  |        |           |      |      |      |      | 931   |
| Low - Restore productivity (1000           |        |           |      |      |      |      |       |
| hectares)                                  |        |           |      |      |      |      |       |
| Land impacted for carbon sink potential -  |        |           |      |      |      |      | 3,642 |
| Low - Total impacted (over 30 years)       |        |           |      |      |      |      |       |
| (1000 hectares)                            |        |           |      |      |      |      |       |
| Land impacted for carbon sink potential -  |        |           |      |      |      |      | 43.7  |
| Mid - Accelerate regeneration (1000        |        |           |      |      |      |      |       |
| hectares)                                  |        |           |      |      |      |      |       |
| Land impacted for carbon sink potential -  |        |           |      |      |      |      | 175   |
| Mid - Avoid deforestation (over 30 years)  |        |           |      |      |      |      |       |
| (1000 hectares)                            |        |           |      |      |      |      |       |
| Land impacted for carbon sink potential -  |        |           |      |      |      |      | 3,254 |
| Mid - Extend rotation length (1000         |        |           |      |      |      |      | 0,204 |
| hectares)                                  |        |           |      |      |      |      |       |
| Land impacted for carbon sink potential -  |        |           |      |      |      |      | 844   |
| Mid - Improve plantations (1000 hectares)  |        |           |      |      |      |      | 044   |
| Land impacted for carbon sink potential -  |        |           |      |      |      |      | 0     |
| Mid - Increase retention of HWP (1000      |        |           |      |      |      |      | U     |
| hectares)                                  |        |           |      |      |      |      |       |
| Land impacted for carbon sink potential -  |        |           |      |      |      |      | 81.2  |
| Mid - Increase trees outside forests (1000 |        |           |      |      |      |      | 01.2  |
| hectares)                                  |        |           |      |      |      |      |       |
| Land impacted for carbon sink potential -  |        |           |      |      |      |      | 53.4  |
|  |        |           |      |      |      |      | 55.4  |
| Mid - Reforest cropland (1000 hectares)    |        |           |      |      |      |      |       |
| Land impacted for carbon sink potential -  |        |           |      |      |      |      | 410   |
| Mid - Reforest pasture (1000 hectares)     |        |           |      |      |      |      | 4.5=: |
| Land impacted for carbon sink potential -  |        |           |      |      |      |      | 1,876 |
| Mid - Restore productivity (1000           |        |           |      |      |      |      |       |
| hectares)                                  |        |           |      |      |      |      |       |
| Land impacted for carbon sink potential -  | $\Box$ | $\exists$ | T    |      |      |      | 6,737 |
| Mid - Total impacted (over 30 years) (1000 |        |           |      |      |      |      |       |
| hectares)                                  |        |           |      |      |      |      |       |

Table 34: E+RE+ scenario - IMPACTS - Health

| Item                                  | 2020 | 2025 | 2030  | 2035  | 2040 | 2045  | 2050  |
|---------------------------------------|------|------|-------|-------|------|-------|-------|
| Monetary damages from air pollution - |      | 319  | 0.217 | 0.206 | 0.16 | 0.104 | 0.004 |
| Coal (million 2019\$)                 |      |      |       |       |      |       |       |

| Table 34: | E+RE+ scenario - | · IMPACTS - | Health | l continued l |
|-----------|------------------|-------------|--------|---------------|

| Item                                  | 2020 | 2025 | 2030  | 2035  | 2040  | 2045  | 2050  |
|---------------------------------------|------|------|-------|-------|-------|-------|-------|
| Monetary damages from air pollution - |      | 104  | 59.7  | 24.6  | 17.2  | 5.17  | 2.89  |
| Natural Gas (million 2019\$)          |      |      |       |       |       |       |       |
| Monetary damages from air pollution - |      | 404  | 374   | 283   | 163   | 74.8  | 30.8  |
| Transportation (million 2019\$)       |      |      |       |       |       |       |       |
| Premature deaths from air pollution - |      | 36   | 0.024 | 0.023 | 0.018 | 0.012 | 0     |
| Coal (deaths)                         |      |      |       |       |       |       |       |
| Premature deaths from air pollution - |      | 11.7 | 6.74  | 2.78  | 1.95  | 0.583 | 0.326 |
| Natural Gas (deaths)                  |      |      |       |       |       |       |       |
| Premature deaths from air pollution - |      | 45.5 | 42.1  | 31.8  | 18.3  | 8.42  | 3.46  |
| Transportation (deaths)               |      |      |       |       |       |       |       |

# Table 35: E+RE- scenario - PILLAR 1: Efficiency/Electrification - Commercial

| Item                                       | 2020 | 2025   | 2030   | 2035  | 2040 | 2045 | 2050 |
|--|------|--------|--------|-------|------|------|------|
| Commercial HVAC investment in 2020s -      | 0    | 10,539 | 12,307 | 0     | 0    | 0    | 0    |
| Cumulative 5-yr (million \$2018)           |      |        |        |       |      |      |      |
| Sales of cooking units - Electric          | 30.1 | 44.4   | 79.2   | 86.1  | 86.5 | 86.5 | 86.5 |
| Resistance (%)                             |      |        |        |       |      |      |      |
| Sales of cooking units - Gas (%)           | 69.9 | 55.6   | 20.8   | 13.9  | 13.5 | 13.5 | 13.5 |
| Sales of space heating units - Electric    | 2.92 | 27.3   | 77.1   | 91.1  | 92.3 | 92.3 | 92.3 |
| Heat Pump (%)                              |      |        |        |       |      |      |      |
| Sales of space heating units - Electric    | 2.74 | 4.44   | 4.73   | 6.05  | 6.35 | 6.37 | 6.39 |
| Resistance (%)                             |      |        |        |       |      |      |      |
| Sales of space heating units - Fossil (%)  | 0    | 0      | 0      | 0     | 0    | 0    | 0    |
| Sales of space heating units - Gas Furnace | 94.3 | 68.3   | 18.2   | 2.83  | 1.38 | 1.34 | 1.33 |
| (%)  |      |        |        |       |      |      |      |
| Sales of water heating units - Electric    | 0.08 | 10.7   | 56.3   | 66.5  | 66.9 | 66.9 | 66.9 |
| Heat Pump (%)                              |      |        |        |       |      |      |      |
| Sales of water heating units - Electric    | 2.31 | 8.07   | 26.9   | 31.1  | 31.3 | 31.3 | 31.3 |
| Resistance (%)                             |      |        |        |       |      |      |      |
| Sales of water heating units - Gas Furnace | 96.5 | 79.4   | 15     | 0.632 | 0    | 0    | 0    |
| (%)  |      |        |        |       |      |      |      |
| Sales of water heating units - Other (%)   | 1.07 | 1.78   | 1.78   | 1.78  | 1.79 | 1.79 | 1.8  |

# Table 36: E+RE- scenario - PILLAR 1: Efficiency/Electrification - Electricity demand

| Item  | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|------|------|------|------|------|------|------|
| Electricity distribution capital invested - |      | 2.42 | 2.48 | 3.87 | 4.09 | 4.01 | 4.2  |
| Cumulative 5-yr (billion \$2018)            |      |      |      |      |      |      |      |

### Table 37: E+RE- scenario - PILLAR 1: Efficiency/Electrification - Overview

| Item                                   | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|------|------|------|------|------|------|------|
| Final energy use - Commercial (PJ)     | 90   | 90.4 | 87   | 81.6 | 77.4 | 76.4 | 78.1 |
| Final energy use - Industry (PJ)       | 236  | 242  | 246  | 246  | 250  | 250  | 255  |
| Final energy use - Residential (PJ)    | 123  | 117  | 108  | 95.6 | 85.1 | 78.9 | 76.1 |
| Final energy use - Transportation (PJ) | 324  | 303  | 265  | 220  | 179  | 155  | 146  |

### Table 38: E+RE- scenario - PILLAR 1: Efficiency/Electrification - Residential

| Item                                     | 2020 | 2025 | 2030 | 2035  | 2040 | 2045 | 2050 |
|--|------|------|------|-------|------|------|------|
| Residential HVAC investment in 2020s vs. | 0    | 2.31 | 2.82 | 0     | 0    | 0    | 0    |
| REF - Cumulative 5-yr (billion \$2018)   |      |      |      |       |      |      |      |
| Sales of cooking units - Electric        | 52.7 | 62.8 | 93.6 | 99.7  | 100  | 100  | 100  |
| Resistance (%)                           |      |      |      |       |      |      |      |
| Sales of cooking units - Gas (%)         | 47.3 | 37.2 | 6.37 | 0.321 | 0    | 0    | 0    |
| Sales of space heating units - Electric  | 11.9 | 27.2 | 74.3 | 84.8  | 85.3 | 85.2 | 85.2 |
| Heat Pump (%)                            |      |      |      |       |      |      |      |
| Sales of space heating units - Electric  | 34.9 | 33.8 | 14.2 | 9.82  | 9.65 | 9.82 | 9.86 |
| Resistance (%)                           |      |      |      |       |      |      |      |

| Table 20, E, DE | aganania   | DTIIAD 1. | Efficiency/Electrification | Dooidontial   | (continued) |
|-----------------|------------|-----------|----------------------------|---------------|-------------|
| 14016 30. E+KE- | SCEHUITO - | PILLAR I. | EIIICIEIICV/EIECH IIICUHUH | - Residential | ICOHUHURUI  |

| Item  | 2020 | 2025 | 2030 | 2035  | 2040  | 2045  | 2050  |
|---|------|------|------|-------|-------|-------|-------|
| Sales of space heating units - Fossil (%)                 | 8.14 | 11.9 | 5.59 | 4.18  | 4.11  | 4.04  | 4.03  |
| Sales of space heating units - Gas (%)                    | 45.1 | 27.1 | 5.9  | 1.18  | 0.978 | 0.957 | 0.954 |
| Sales of water heating units - Electric<br>Heat Pump (%)  | 0    | 11.3 | 59.7 | 70.6  | 71.1  | 71.1  | 71.1  |
| Sales of water heating units - Electric<br>Resistance (%) | 44.5 | 51.9 | 32.1 | 27.6  | 27.4  | 27.4  | 27.4  |
| Sales of water heating units - Gas Furnace (%)            | 53.7 | 35.3 | 6.65 | 0.277 | 0     | 0     | 0     |
| Sales of water heating units - Other (%)                  | 1.86 | 1.52 | 1.52 | 1.49  | 1.49  | 1.5   | 1.5   |

# Table 39: E+RE- scenario - PILLAR 1: Efficiency/Electrification - Transportation

| Item                                       | 2020  | 2025  | 2030  | 2035  | 2040  | 2045  | 2050  |
|--|-------|-------|-------|-------|-------|-------|-------|
| Light-duty vehicle capital costs -         | 0     | 542   | 1,384 | 2,253 | 3,409 | 3,714 | 3,539 |
| Cumulative 5-yr (million \$2018)           |       |       |       |       |       |       |       |
| Public EV charging plugs - DC Fast (1000   | 0.043 | 0     | 1.12  | 0     | 5.01  | 0     | 8.11  |
| units)                                     |       |       |       |       |       |       |       |
| Public EV charging plugs - L2 (1000 units) | 0.243 | 0     | 26.9  | 0     | 120   | 0     | 195   |
| Vehicle sales - Heavy-duty - diesel (%)    | 97.2  | 92.1  | 67    | 23.3  | 4.22  | 0.628 | 0     |
| Vehicle sales - Heavy-duty - EV (%)        | 0.588 | 3.81  | 19    | 45.6  | 57.4  | 59.6  | 60    |
| Vehicle sales - Heavy-duty - gasoline (%)  | 0.227 | 0.227 | 0.176 | 0.066 | 0.013 | 0.002 | 0     |
| Vehicle sales - Heavy-duty - hybrid (%)    | 0.082 | 0.09  | 0.077 | 0.031 | 0.007 | 0.001 | 0     |
| Vehicle sales - Heavy-duty - hydrogen FC   | 0.392 | 2.54  | 12.7  | 30.4  | 38.2  | 39.7  | 40    |
| (%)  |       |       |       |       |       |       |       |
| Vehicle sales - Heavy-duty - other (%)     | 1.5   | 1.23  | 1.07  | 0.568 | 0.163 | 0.038 | 0     |
| Vehicle sales - Light-duty - diesel (%)    | 1.81  | 2.04  | 1.36  | 0.439 | 0.079 | 0.013 | 0     |
| Vehicle sales - Light-duty - EV (%)        | 3.04  | 12.5  | 42.3  | 80.1  | 96.1  | 99.3  | 100   |
| Vehicle sales - Light-duty - gasoline (%)  | 91.3  | 81    | 53.1  | 18.2  | 3.51  | 0.597 | 0     |
| Vehicle sales - Light-duty - hybrid (%)    | 3.57  | 3.93  | 2.92  | 1.11  | 0.266 | 0.056 | 0     |
| Vehicle sales - Light-duty - hydrogen FC   | 0.112 | 0.354 | 0.224 | 0.071 | 0.014 | 0.002 | 0     |
| (%)  |       |       |       |       |       |       |       |
| Vehicle sales - Light-duty - other (%)     | 0.113 | 0.11  | 0.074 | 0.026 | 0.005 | 0.001 | 0     |
| Vehicle sales - Medium-duty - diesel (%)   | 64.7  | 59.7  | 42.3  | 14.4  | 2.59  | 0.384 | 0     |
| Vehicle sales - Medium-duty - EV (%)       | 0.784 | 5.07  | 25.3  | 60.8  | 76.5  | 79.5  | 80    |
| Vehicle sales - Medium-duty - gasoline (%) | 33.7  | 33.3  | 25.5  | 9.32  | 1.77  | 0.277 | 0     |
| Vehicle sales - Medium-duty - hybrid (%)   | 0.363 | 0.402 | 0.341 | 0.14  | 0.03  | 0.005 | 0     |
| Vehicle sales - Medium-duty - hydrogen     | 0.196 | 1.27  | 6.33  | 15.2  | 19.1  | 19.9  | 20    |
| FC (%)                                     |       |       |       |       |       |       |       |
| Vehicle sales - Medium-duty - other (%)    | 0.253 | 0.255 | 0.205 | 0.083 | 0.019 | 0.004 | 0     |

### Table 40: E+RE- scenario - PILLAR 2: Clean Electricity - Generating capacity

|  |      | •     | <u> </u> | <i>,</i> |      |      |      |
|--|------|-------|----------|----------|------|------|------|
| Item   | 2020 | 2025  | 2030     | 2035     | 2040 | 2045 | 2050 |
| Capital invested - Solar PV - Base (billion \$2018)        |      | 0.463 | 1.85     | 2        | 1.93 | 0    | 0    |
| \$2010j  |      |       |          |          |      |      |      |
| Capital invested - Solar PV - Constrained (billion \$2018) |      | 1.81  | 2.13     | 1.76     | 3.38 | 2.64 | 0    |
| Capital invested - Wind - Base (billion<br>\$2018)         |      | 2.7   | 1.94     | 0.055    | 4.45 | 5.63 | 10.7 |
| Capital invested - Wind - Constrained (billion \$2018)     |      | 4.74  | 4.41     | 0.402    | 6.29 | 6.57 | 19.3 |

### Table 41: E+RE- scenario - PILLAR 2: Clean Electricity - Generation

| Item                                     | 2020  | 2025   | 2030   | 2035  | 2040   | 2045   | 2050   |
|--|-------|--------|--------|-------|--------|--------|--------|
| Solar - Base land use assumptions (GWh)  | 409   | 658    | 2,950  | 3,475 | 3,539  | 0      | 0      |
| Solar - Constrained land use assumptions | 409   | 2,576  | 3,399  | 3,044 | 6,216  | 5,152  | 0      |
| (GWh)                                    |       |        |        |       |        |        |        |
| Wind - Base land use assumptions (GWh)   | 0.381 | 6,347  | 4,671  | 165   | 12,376 | 16,859 | 33,130 |
| Wind - Constrained land use assumptions  | 1,673 | 11,345 | 11,299 | 1,186 | 17,721 | 18,659 | 55,022 |
| (GWh)                                    |       |        |        |       |        |        |        |

Table 42: E+RE- scenario - PILLAR 6: Land sinks - Agriculture

| lable 42: E+RE- scenario - PILLAR 6: Land                       |      |      | 0000 | 2005 | 0010 | 00/5 | 2050    |
|---|------|------|------|------|------|------|---------|
| Item  | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050    |
| Carbon sink potential - Aggressive                              |      |      |      |      |      |      | -243    |
| deployment - Corn-ethanol to energy                             |      |      |      |      |      |      |         |
| grasses (1000 tC02e/y)  |      |      |      |      |      |      |         |
| Carbon sink potential - Aggressive                              |      |      |      |      |      |      | -10,076 |
| deployment - Cropland measures (1000                            |      |      |      |      |      |      |         |
| tCO2e/y)  |      |      |      |      |      |      |         |
| Carbon sink potential - Aggressive                              |      |      |      |      |      |      | -64.8   |
| deployment - Permanent conservation                             |      |      |      |      |      |      |         |
| cover (1000 tCO2e/y)  |      |      |      |      |      |      |         |
| Carbon sink potential - Aggressive                              |      |      |      |      |      |      | -10,383 |
| deployment - Total (1000 tCO2e/y)                               |      |      |      |      |      |      |         |
| Carbon sink potential - Moderate                                |      |      |      |      |      |      | -243    |
| deployment - Corn-ethanol to energy                             |      |      |      |      |      |      |         |
| grasses (1000 tCO2e/y)  |      |      |      |      |      |      |         |
| Carbon sink potential - Moderate                                |      |      |      |      |      |      | -5,130  |
| deployment - Cropland measures (1000                            |      |      |      |      |      |      |         |
| tCO2e/y)  |      |      |      |      |      |      |         |
| Carbon sink potential - Moderate                                |      |      |      |      |      |      | -32.4   |
| deployment - Permanent conservation                             |      |      |      |      |      |      |         |
| cover (1000 tCO2e/y)  |      |      |      |      |      |      |         |
| Carbon sink potential - Moderate                                |      |      |      |      |      |      | -5,405  |
| deployment - Total (1000 tCO2e/y)                               |      |      |      |      |      |      | ·       |
| Land impacted for carbon sink -                                 |      |      |      |      |      |      | 96.4    |
| Aggressive deployment - Corn-ethanol to                         |      |      |      |      |      |      |         |
| energy grasses (1000 hectares)                                  |      |      |      |      |      |      |         |
| Land impacted for carbon sink -                                 |      |      |      |      |      |      | 2,955   |
| Aggressive deployment - Cropland                                |      |      |      |      |      |      | ,       |
| measures (1000 hectares)  |      |      |      |      |      |      |         |
| Land impacted for carbon sink -                                 |      |      |      |      |      |      | 118     |
| Aggressive deployment - Permanent                               |      |      |      |      |      |      |         |
| conservation cover (1000 hectares)                              |      |      |      |      |      |      |         |
| Land impacted for carbon sink -                                 |      |      |      |      |      |      | 3,170   |
| Aggressive deployment - Total (1000                             |      |      |      |      |      |      | 0,110   |
| hectares)   |      |      |      |      |      |      |         |
| Land impacted for carbon sink - Moderate                        |      | +    |      |      |      |      | 96.4    |
| deployment - Corn-ethanol to energy                             |      |      |      |      |      |      | 70.4    |
| grasses (1000 hectares)   |      |      |      |      |      |      |         |
| Land impacted for carbon sink - Moderate                        |      | +    |      | +    |      |      | 1,507   |
| deployment - Cropland measures (1000                            |      |      |      |      |      |      | 1,501   |
| hectares)   |      |      |      |      |      |      |         |
| Land impacted for carbon sink - Moderate                        |      | +    | -    |      |      |      | 58.9    |
| deployment - Permanent conservation                             |      |      |      |      |      |      | 56.9    |
| 7 7   |      |      |      |      |      |      |         |
| cover (1000 hectares)  Land impacted for carbon sink - Moderate |      |      |      |      |      |      | 1,662   |
| ·   |      |      |      |      |      |      | 1,662   |
| deployment - Total (1000 hectares)                              |      |      |      |      |      |      |         |

Table 43: E+RE- scenario - PILLAR 6: Land sinks - Forests

| Item                                      | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050    |
|---|------|------|------|------|------|------|---------|
| Carbon sink potential - High - Accelerate |      |      |      |      |      |      | -356    |
| regeneration (1000 tCO2e/y)               |      |      |      |      |      |      |         |
| Carbon sink potential - High - All (not   |      |      |      |      |      |      | -46,154 |
| counting overlap) (1000 tCO2e/y)          |      |      |      |      |      |      |         |
| Carbon sink potential - High - Avoid      |      |      |      |      |      |      | -1,334  |
| deforestation (1000 tCO2e/y)              |      |      |      |      |      |      |         |
| Carbon sink potential - High - Extend     |      |      |      |      |      |      | -9,227  |
| rotation length (1000 tCO2e/y)            |      |      |      |      |      |      |         |
| Carbon sink potential - High - Improve    |      |      |      |      |      |      | -3,044  |
| plantations (1000 tCO2e/y)                |      |      |      |      |      |      |         |
| Carbon sink potential - High - Increase   |      |      |      |      |      |      | -13,825 |
| retention of HWP (1000 tCO2e/y)           |      |      |      |      |      |      |         |

Table 43: E+RE- scenario - PILLAR 6: Land sinks - Forests (continued)

| Item  | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050    |
|---|------|------|------|------|------|------|---------|
| Carbon sink potential - High - Increase                                     |      |      |      |      |      |      | -1,120  |
| trees outside forests (1000 tCO2e/y)  |      |      |      |      |      |      |         |
| Carbon sink potential - High - Reforest cropland (1000 tCO2e/y)             |      |      |      |      |      |      | -1,077  |
| Carbon sink potential - High - Reforest pasture (1000 tC02e/y)              |      |      |      |      |      |      | -11,526 |
| Carbon sink potential - High - Restore productivity (1000 tC02e/y)          |      |      |      |      |      |      | -4,644  |
| Carbon sink potential - Low - Accelerate                                    |      |      |      |      |      |      | -178    |
| regeneration (1000 tCO2e/y) Carbon sink potential - Low - All (not          |      |      |      |      |      |      | -13,471 |
| counting overlap) (1000 tCO2e/y) Carbon sink potential - Low - Avoid        |      |      |      |      |      |      | -222    |
| deforestation (1000 tC02e/y)  |      |      |      |      |      |      |         |
| Carbon sink potential - Low - Extend rotation length (1000 tCO2e/y)         |      |      |      |      |      |      | -3,544  |
| Carbon sink potential - Low - Improve plantations (1000 tCO2e/y)            |      |      |      |      |      |      | -1,549  |
| Carbon sink potential - Low - Increase                                      |      |      |      |      |      |      | -4,608  |
| retention of HWP (1000 tCO2e/y)  Carbon sink potential - Low - Increase     |      |      |      |      |      |      | -392    |
| trees outside forests (1000 tCO2e/y)  |      |      |      |      |      |      | -392    |
| Carbon sink potential - Low - Reforest                                      |      |      |      |      |      |      | -538    |
| cropland (1000 tCO2e/y) Carbon sink potential - Low - Reforest              |      |      |      |      |      |      | -873    |
| pasture (1000 tC02e/y)  Carbon sink potential - Low - Restore               |      |      |      |      |      |      | -1,565  |
| productivity (1000 tCO2e/y)   |      |      |      |      |      |      | -1,565  |
| Carbon sink potential - Mid - Accelerate regeneration (1000 tCO2e/y)        |      |      |      |      |      |      | -267    |
| Carbon sink potential - Mid - All (not                                      |      |      |      |      |      |      | -29,786 |
| counting overlap) (1000 tCO2e/y) Carbon sink potential - Mid - Avoid        |      |      |      |      |      |      | -778    |
| deforestation (1000 tCO2e/y) Carbon sink potential - Mid - Extend           |      |      |      |      |      |      | -6,386  |
| rotation length (1000 tCO2e/y)  |      |      |      |      |      |      |         |
| Carbon sink potential - Mid - Improve plantations (1000 tCO2e/y)            |      |      |      |      |      |      | -2,270  |
| Carbon sink potential - Mid - Increase retention of HWP (1000 tCO2e/y)      |      |      |      |      |      |      | -9,217  |
| Carbon sink potential - Mid - Increase                                      |      |      |      |      |      |      | -756    |
| trees outside forests (1000 tCO2e/y) Carbon sink potential - Mid - Reforest |      |      |      |      |      |      | -807    |
| cropland (1000 tCO2e/y)  Carbon sink potential - Mid - Reforest             |      |      |      |      |      |      | -6,200  |
| pasture (1000 tCO2e/y)  |      |      |      |      |      |      |         |
| Carbon sink potential - Mid - Restore productivity (1000 tCO2e/y)           |      |      |      |      |      |      | -3,105  |
| Land impacted for carbon sink potential -                                   |      |      |      |      |      |      | 58.3    |
| High - Accelerate regeneration (1000 hectares)                              |      |      |      |      |      |      |         |
| Land impacted for carbon sink potential -                                   |      |      |      |      |      |      | 181     |
| High - Avoid deforestation (over 30 years) (1000 hectares)                  |      |      |      |      |      |      |         |
| Land impacted for carbon sink potential -                                   |      |      |      |      |      |      | 4,705   |
| High - Extend rotation length (1000 hectares)                               |      |      |      |      |      |      | 7,100   |
| Land impacted for carbon sink potential -                                   |      |      |      |      |      |      | 1,121   |
| High - Improve plantations (1000 hectares)                                  |      |      |      |      |      |      | •       |

Table 43: E+RE- scenario - PILLAR 6: Land sinks - Forests (continued)

| Item Land impacted for carbon sink potential -            | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050  |
|---|------|------|------|------|------|------|-------|
| High - Increase retention of HWP (1000                    |      |      |      |      |      |      | U     |
| hectares)   |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -                 |      |      |      |      |      |      | 106   |
| High - Increase trees outside forests                     |      |      |      |      |      |      |       |
| (1000 hectares)   |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -                 |      |      |      |      |      |      | 71.2  |
| High - Reforest cropland (1000 hectares)                  |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -                 |      |      |      |      |      |      | 327   |
| High - Reforest pasture (1000 hectares)                   |      |      |      |      |      |      | 4 500 |
| Land impacted for carbon sink potential -                 |      |      |      |      |      |      | 1,539 |
| High - Restore productivity (1000                         |      |      |      |      |      |      |       |
| hectares)   |      |      |      |      |      |      | 0.110 |
| Land impacted for carbon sink potential -                 |      |      |      |      |      |      | 8,110 |
| High - Total impacted (over 30 years)                     |      |      |      |      |      |      |       |
| (1000 hectares) Land impacted for carbon sink potential - |      |      |      |      |      |      | 29.1  |
| Low - Accelerate regeneration (1000                       |      |      |      |      |      |      | 29.1  |
| hectares)   |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -                 |      |      |      |      |      |      | 170   |
| Low - Avoid deforestation (over 30 years)                 |      |      |      |      |      |      | 170   |
| (1000 hectares)   |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -                 |      |      |      |      |      |      | 1,803 |
| Low - Extend rotation length (1000                        |      |      |      |      |      |      | 1,003 |
| hectares)   |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -                 |      |      |      |      |      |      | 561   |
| Low - Improve plantations (1000                           |      |      |      |      |      |      | 301   |
| hectares)   |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -                 |      |      |      |      |      |      | 0     |
| Low - Increase retention of HWP (1000                     |      |      |      |      |      |      | ·     |
| hectares)   |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -                 |      |      |      |      |      |      | 56    |
| Low - Increase trees outside forests                      |      |      |      |      |      |      |       |
| (1000 hectares)   |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -                 |      |      |      |      |      |      | 35.6  |
| Low - Reforest cropland (1000 hectares)                   |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -                 |      |      |      |      |      |      | 56.8  |
| Low - Reforest pasture (1000 hectares)                    |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -                 |      |      |      |      |      |      | 931   |
| Low - Restore productivity (1000                          |      |      |      |      |      |      |       |
| hectares)   |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -                 |      |      |      |      |      |      | 3,642 |
| Low - Total impacted (over 30 years)                      |      |      |      |      |      |      |       |
| (1000 hectares)   |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -                 |      |      |      |      |      |      | 43.7  |
| Mid - Accelerate regeneration (1000                       |      |      |      |      |      |      |       |
| hectares)   |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -                 |      |      |      |      |      |      | 175   |
| Mid - Avoid deforestation (over 30 years)                 |      |      |      |      |      |      |       |
| (1000 hectares)   |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -                 |      |      |      |      |      |      | 3,254 |
| Mid - Extend rotation length (1000                        |      |      |      |      |      |      |       |
| hectares)   |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -                 |      |      |      |      |      |      | 844   |
| 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 -                 |      |      |      |      |      |      | 81.2  |
| Mid - Increase trees outside forests (1000                |      |      |      |      |      |      |       |
| hectares)   |      |      |      |      |      |      |       |

| Table 43: E+RE- | econario -   | DTIIADA | · I and einke .   | Forests    | (continued) |
|-----------------|--------------|---------|-------------------|------------|-------------|
| 1auit 45. E+KE- | SCEIIUI 10 - | PILLAR  | o. Luiiu Siiiks · | - ศบาษธเธา | CUILLIIUEUI |

| Item                                       | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050  |
|--|------|------|------|------|------|------|-------|
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 53.4  |
| Mid - Reforest cropland (1000 hectares)    |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 410   |
| Mid - Reforest pasture (1000 hectares)     |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 1,876 |
| Mid - Restore productivity (1000           |      |      |      |      |      |      |       |
| hectares)                                  |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 6,737 |
| Mid - Total impacted (over 30 years) (1000 |      |      |      |      |      |      |       |
| hectares)                                  |      |      |      |      |      |      |       |

### Table 44: E+RE- scenario - IMPACTS - Health

| Item                                  | 2020 | 2025 | 2030  | 2035  | 2040  | 2045  | 2050  |
|---------------------------------------|------|------|-------|-------|-------|-------|-------|
| Monetary damages from air pollution - |      | 319  | 0.217 | 0.206 | 0.16  | 0.104 | 0.004 |
| Coal (million 2019\$)                 |      |      |       |       |       |       |       |
| Monetary damages from air pollution - |      | 117  | 64.9  | 68    | 54.8  | 18.6  | 5.95  |
| Natural Gas (million 2019\$)          |      |      |       |       |       |       |       |
| Monetary damages from air pollution - |      | 404  | 374   | 283   | 163   | 74.8  | 30.8  |
| Transportation (million 2019\$)       |      |      |       |       |       |       |       |
| Premature deaths from air pollution - |      | 36   | 0.024 | 0.023 | 0.018 | 0.012 | 0     |
| Coal (deaths)                         |      |      |       |       |       |       |       |
| Premature deaths from air pollution - |      | 13.2 | 7.33  | 7.68  | 6.19  | 2.1   | 0.672 |
| Natural Gas (deaths)                  |      |      |       |       |       |       |       |
| Premature deaths from air pollution - |      | 45.5 | 42.1  | 31.8  | 18.3  | 8.42  | 3.46  |
| Transportation (deaths)               |      |      |       |       |       |       |       |

### Table 45: E-B+ scenario - PILLAR 1: Efficiency/Electrification - Commercial

| Item  | 2020 | 2025   | 2030   | 2035 | 2040 | 2045 | 2050 |
|---|------|--------|--------|------|------|------|------|
| Commercial HVAC investment in 2020s -<br>Cumulative 5-yr (million \$2018) | 0    | 10,527 | 12,223 | 0    | 0    | 0    | 0    |
| Sales of cooking units - Electric<br>Resistance (%)                       | 30.1 | 34.2   | 39     | 52   | 70.1 | 81.2 | 85   |
| Sales of cooking units - Gas (%)  | 69.9 | 65.8   | 61     | 48   | 29.9 | 18.8 | 15   |
| Sales of space heating units - Electric<br>Heat Pump (%)                  | 2.92 | 17.8   | 23.5   | 40   | 65.6 | 83.3 | 89.8 |
| Sales of space heating units - Electric<br>Resistance (%)                 | 2.74 | 4.44   | 4.48   | 4.65 | 5.07 | 5.74 | 6.19 |
| Sales of space heating units - Fossil (%)                                 | 0    | 0      | 0      | 0    | 0    | 0    | 0    |
| Sales of space heating units - Gas Furnace (%)                            | 94.3 | 77.8   | 72     | 55.4 | 29.3 | 11   | 3.97 |
| Sales of water heating units - Electric<br>Heat Pump (%)                  | 0.08 | 1.96   | 7.15   | 22.1 | 45   | 59.9 | 65.1 |
| Sales of water heating units - Electric<br>Resistance (%)                 | 2.31 | 4.44   | 6.56   | 12.7 | 22.2 | 28.4 | 30.5 |
| Sales of water heating units - Gas Furnace (%)                            | 96.5 | 91.8   | 84.5   | 63.4 | 31   | 9.91 | 2.58 |
| Sales of water heating units - Other (%)                                  | 1.07 | 1.78   | 1.78   | 1.78 | 1.79 | 1.79 | 1.8  |

### Table 46: E-B+ scenario - PILLAR 1: Efficiency/Electrification - Electricity demand

| Item  | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|------|------|------|------|------|------|------|
| Electricity distribution capital invested - |      | 2.1  | 2.13 | 2.57 | 2.64 | 3.75 | 3.95 |
| Cumulative 5-yr (billion \$2018)            |      |      |      |      |      |      |      |

### Table 47: E-B+ scenario - PILLAR 1: Efficiency/Electrification - Overview

| Item                               | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|------------------------------------|------|------|------|------|------|------|------|
| Final energy use - Commercial (PJ) | 90   | 90.7 | 90.4 | 89.6 | 87.6 | 85.4 | 84.4 |

Table 47: E-B+ scenario - PILLAR 1: Efficiency/Electrification - Overview (continued)

| Item                                   | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|------|------|------|------|------|------|------|
| Final energy use - Industry (PJ)       | 236  | 243  | 246  | 249  | 254  | 253  | 258  |
| Final energy use - Residential (PJ)    | 123  | 118  | 114  | 110  | 103  | 94.4 | 86.6 |
| Final energy use - Transportation (PJ) | 324  | 305  | 276  | 255  | 238  | 219  | 197  |

Table 48: E-B+ scenario - PILLAR 1: Efficiency/Electrification - Residential

| Item                                       | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|------|------|------|------|------|------|------|
| Residential HVAC investment in 2020s vs.   | 0    | 2.28 | 2.67 | 0    | 0    | 0    | 0    |
| REF - Cumulative 5-yr (billion \$2018)     |      |      |      |      |      |      |      |
| Sales of cooking units - Electric          | 52.5 | 53.8 | 58.1 | 69.6 | 85.5 | 95.3 | 98.7 |
| Resistance (%)                             |      |      |      |      |      |      |      |
| Sales of cooking units - Gas (%)           | 47.5 | 46.2 | 41.9 | 30.4 | 14.5 | 4.68 | 1.26 |
| Sales of space heating units - Electric    | 11.9 | 18.1 | 23.5 | 39   | 62.6 | 78   | 83.3 |
| Heat Pump (%)                              |      |      |      |      |      |      |      |
| Sales of space heating units - Electric    | 34.9 | 37.6 | 35.2 | 28.7 | 19   | 12.7 | 10.5 |
| Resistance (%)                             |      |      |      |      |      |      |      |
| Sales of space heating units - Fossil (%)  | 8.14 | 13.1 | 12.5 | 10.3 | 7.08 | 5.03 | 4.32 |
| Sales of space heating units - Gas (%)     | 45.1 | 31.2 | 28.8 | 22   | 11.3 | 4.24 | 1.82 |
| Sales of water heating units - Electric    | 0    | 1.94 | 7.45 | 23.3 | 47.7 | 63.6 | 69.1 |
| Heat Pump (%)                              |      |      |      |      |      |      |      |
| Sales of water heating units - Electric    | 44.5 | 55.7 | 53.5 | 47.1 | 37   | 30.5 | 28.2 |
| Resistance (%)                             |      |      |      |      |      |      |      |
| Sales of water heating units - Gas Furnace | 53.7 | 40.9 | 37.5 | 28.1 | 13.8 | 4.37 | 1.13 |
| (%)  |      |      |      |      |      |      |      |
| Sales of water heating units - Other (%)   | 1.86 | 1.52 | 1.52 | 1.51 | 1.52 | 1.5  | 1.5  |

Table 49: E-B+ scenario - PILLAR 1: Efficiency/Electrification - Transportation

| Item                                       | 2020  | 2025  | 2030  | 2035  | 2040  | 2045  | 2050  |
|--|-------|-------|-------|-------|-------|-------|-------|
| Light-duty vehicle capital costs -         | 0     | 0     | 86.7  | 184   | 621   | 1,961 | 2,854 |
| Cumulative 5-yr (million \$2018)           |       |       |       |       |       |       |       |
| Public EV charging plugs - DC Fast (1000   | 0.043 | 0     | 0.334 | 0     | 1.85  | 0     | 5.2   |
| units)                                     |       |       |       |       |       |       |       |
| Public EV charging plugs - L2 (1000 units) | 0.243 | 0     | 8.03  | 0     | 44.4  | 0     | 125   |
| Vehicle sales - Heavy-duty - diesel (%)    | 97.4  | 96    | 91.3  | 79.8  | 58.2  | 32.1  | 13.7  |
| Vehicle sales - Heavy-duty - EV (%)        | 0.498 | 1.45  | 4.11  | 10.8  | 23.6  | 39.5  | 51    |
| Vehicle sales - Heavy-duty - gasoline (%)  | 0.228 | 0.236 | 0.239 | 0.225 | 0.179 | 0.109 | 0.051 |
| Vehicle sales - Heavy-duty - hybrid (%)    | 0.083 | 0.094 | 0.104 | 0.107 | 0.092 | 0.06  | 0.03  |
| Vehicle sales - Heavy-duty - hydrogen FC   | 0.332 | 0.969 | 2.74  | 7.17  | 15.7  | 26.3  | 34    |
| (%)  |       |       |       |       |       |       |       |
| Vehicle sales - Heavy-duty - other (%)     | 1.5   | 1.28  | 1.46  | 1.95  | 2.25  | 1.96  | 1.14  |
| Vehicle sales - Light-duty - diesel (%)    | 1.82  | 2.19  | 2.11  | 1.69  | 1.1   | 0.572 | 0.244 |
| Vehicle sales - Light-duty - EV (%)        | 1.58  | 4.01  | 10.5  | 23.6  | 45.9  | 70.4  | 86.9  |
| Vehicle sales - Light-duty - gasoline (%)  | 92.7  | 88.7  | 81.8  | 69.5  | 49    | 26.6  | 11.7  |
| Vehicle sales - Light-duty - hybrid (%)    | 3.69  | 4.55  | 5.17  | 4.83  | 3.75  | 2.29  | 1.14  |
| Vehicle sales - Light-duty - hydrogen FC   | 0.113 | 0.388 | 0.341 | 0.266 | 0.193 | 0.109 | 0.05  |
| (%)  |       |       |       |       |       |       |       |
| Vehicle sales - Light-duty - other (%)     | 0.114 | 0.118 | 0.109 | 0.096 | 0.07  | 0.039 | 0.018 |
| Vehicle sales - Medium-duty - diesel (%)   | 64.8  | 62.2  | 57.7  | 49.4  | 35.6  | 19.6  | 8.37  |
| Vehicle sales - Medium-duty - EV (%)       | 0.664 | 1.94  | 5.49  | 14.3  | 31.4  | 52.6  | 68    |
| Vehicle sales - Medium-duty - gasoline (%) | 33.8  | 34.7  | 34.7  | 31.9  | 24.4  | 14.2  | 6.33  |
| Vehicle sales - Medium-duty - hybrid (%)   | 0.363 | 0.418 | 0.464 | 0.478 | 0.414 | 0.275 | 0.141 |
| Vehicle sales - Medium-duty - hydrogen     | 0.166 | 0.485 | 1.37  | 3.58  | 7.86  | 13.2  | 17    |
| FC (%)                                     |       |       |       |       |       |       |       |
| Vehicle sales - Medium-duty - other (%)    | 0.253 | 0.266 | 0.279 | 0.286 | 0.258 | 0.184 | 0.102 |

Table 50: E-B+ scenario - PILLAR 2: Clean Electricity - Generating capacity

| Item  | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050  |
|---|------|------|------|------|------|------|-------|
| 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    | 0.063 |
| Capital invested - Biomass w/ccu power plant (billion \$2018)       | 0    | 0    | 0    | 13.1 | 6.33 | 8.69 | 5.05  |

# Table 51: 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 allam power plant (GWh) | 0    | 0    | 0    | 0      | 0      | 0      | 62.9   |
| Biomass w/ccu power plant (GWh)       | 0    | 0    | 0    | 14,741 | 21,844 | 31,603 | 37,270 |

### Table 52: E-B+ scenario - PILLAR 3: Clean fuels - Bioenergy

| Item   | 2020 | 2025 | 2030 | 2035   | 2040   | 2045  | 2050  |
|--|------|------|------|--------|--------|-------|-------|
| Biomass purchases (million \$2018/year)      | 0    | 0    | 0    | 886    | 1,910  | 2,497 | 2,840 |
| Conversion capital investment -              | 0    | 0    | 0    | 12,047 | 12,821 | 7,975 | 4,709 |
| Cumulative 5-yr (million \$2018)             |      |      |      |        |        |       |       |
| Number of facilities - Allam power w ccu     | 0    | 0    | 0    | 0      | 0      | 0     | 1     |
| (quantity)                                   |      |      |      |        |        |       |       |
| Number of facilities - Beccs hydrogen        | 0    | 0    | 0    | 0      | 8      | 8     | 8     |
| (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 - Power (quantity)      | 0    | 0    | 0    | 0      | 0      | 0     | 0     |
| Number of facilities - Power ccu             | 0    | 0    | 0    | 12     | 18     | 26    | 30    |
| (quantity)                                   |      |      |      |        |        |       |       |
| 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     |

### Table 53: E-B+ scenario - PILLAR 4: CCUS - CO2 capture

| Item                               | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|------------------------------------|------|------|------|------|------|------|------|
| Annual - All (MMT)                 |      | 0    | 0    | 14.6 | 30.6 | 40.3 | 45.8 |
| Annual - BECCS (MMT)               |      | 0    | 0    | 14.6 | 30.6 | 40.3 | 45.8 |
| Annual - Cement and lime (MMT)     |      | 0    | 0    | 0    | 0    | 0    | 0    |
| Annual - NGCC (MMT)                |      | 0    | 0    | 0    | 0    | 0    | 0    |
| Cumulative - All (MMT)             |      | 0    | 0    | 14.6 | 45.2 | 85.5 | 131  |
| Cumulative - BECCS (MMT)           |      | 0    | 0    | 14.6 | 45.2 | 85.5 | 131  |
| Cumulative - Cement and lime (MMT) |      | 0    | 0    | 0    | 0    | 0    | 0    |
| Cumulative - NGCC (MMT)            |      | 0    | 0    | 0    | 0    | 0    | 0    |

# Table 54: E-B+ scenario - PILLAR 4: CCUS - CO2 pipelines

| Item   | 2020 | 2025 | 2030 | 2035 | 2040  | 2045  | 2050  |
|--|------|------|------|------|-------|-------|-------|
| All (km)                                       |      | 0    | 39.8 | 150  | 721   | 1,074 | 1,074 |
| Cumulative investment - All (million \$2018)   |      | 0    | 284  | 887  | 1,728 | 2,267 | 2,443 |
| Cumulative investment - Spur (million \$2018)  |      | 0    | 0    | 318  | 874   | 1,414 | 1,589 |
| Cumulative investment - Trunk (million \$2018) |      | 0    | 284  | 569  | 853   | 853   | 853   |
| Spur (km)                                      |      | 0    | 0    | 69.9 | 602   | 955   | 955   |
| Trunk (km)                                     |      | 0    | 39.8 | 79.6 | 119   | 119   | 119   |

Table 55: E-B+ scenario - PILLAR 4: CCUS - CO2 storage

|   |      | •    |      |      |      |       |       |
|---|------|------|------|------|------|-------|-------|
| Item  | 2020 | 2025 | 2030 | 2035 | 2040 | 2045  | 2050  |
| CO2 storage (MMT)   |      | 0    | 3.69 | 15   | 30.9 | 41.4  | 45.1  |
| Injection wells (wells)   |      | 0    | 4    | 14   | 26   | 42    | 54    |
| Resource characterization, appraisal, permitting costs (million \$2020) |      | 14.2 | 350  | 562  | 562  | 562   | 562   |
| Wells and facilities construction costs (million \$2020)                |      | 0    | 111  | 432  | 770  | 1,288 | 1,600 |

### Table 56: E-B+ scenario - PILLAR 6: Land sinks - Agriculture

| Table 56: E-B+ scenario - PILLAR 6: Land<br>Item | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050    |
|--|------|------|------|------|------|------|---------|
| Carbon sink potential - Aggressive               | 2020 | 2023 | 2030 | 2000 | 2040 | 2043 | -923    |
| deployment - Corn-ethanol to energy              |      |      |      |      |      |      | -720    |
| grasses (1000 tC02e/y)                           |      |      |      |      |      |      |         |
| Carbon sink potential - Aggressive               |      |      |      |      |      |      | -9,220  |
| deployment - Cropland measures (1000             |      |      |      |      |      |      | 7,220   |
| tCO2e/y)   |      |      |      |      |      |      |         |
| Carbon sink potential - Aggressive               |      |      |      |      |      |      | 0       |
| deployment - Cropland to woody energy            |      |      |      |      |      |      | U       |
| crops (1000 tC02e/y)                             |      |      |      |      |      |      |         |
| Carbon sink potential - Aggressive               |      |      |      |      |      |      | 0       |
| deployment - Pasture to energy crops             |      |      |      |      |      |      | U       |
| (1000 tC02e/y)                                   |      |      |      |      |      |      |         |
| Carbon sink potential - Aggressive               |      |      |      |      |      |      | -49.6   |
| deployment - Permanent conservation              |      |      |      |      |      |      | -47.0   |
| cover (1000 tC02e/y)                             |      |      |      |      |      |      |         |
| Carbon sink potential - Aggressive               |      |      |      |      |      |      | -10,192 |
| deployment - Total (1000 tC02e/y)                |      |      |      |      |      |      | -10,172 |
| Carbon sink potential - Moderate                 |      |      |      | +    |      |      | -923    |
| deployment - Corn-ethanol to energy              |      |      |      |      |      |      | 720     |
| grasses (1000 tC02e/y)                           |      |      |      |      |      |      |         |
| Carbon sink potential - Moderate                 |      |      |      | +    |      |      | -4,678  |
| deployment - Cropland measures (1000             |      |      |      |      |      |      | -4,010  |
| tCO2e/y)   |      |      |      |      |      |      |         |
| Carbon sink potential - Moderate                 |      |      |      |      |      |      | 0       |
| deployment - Cropland to woody energy            |      |      |      |      |      |      | U       |
| crops (1000 tC02e/y)                             |      |      |      |      |      |      |         |
| Carbon sink potential - Moderate                 |      |      |      |      |      |      | 0       |
| deployment - Pasture to energy crops             |      |      |      |      |      |      | U       |
| (1000 tC02e/y)                                   |      |      |      |      |      |      |         |
| Carbon sink potential - Moderate                 |      |      |      | +    |      |      | -24.8   |
| deployment - Permanent conservation              |      |      |      |      |      |      | 24.0    |
| cover (1000 tC02e/y)                             |      |      |      |      |      |      |         |
| Carbon sink potential - Moderate                 |      |      |      |      |      |      | -5,626  |
| deployment - Total (1000 tC02e/y)                |      |      |      |      |      |      | -0,020  |
| Land impacted for carbon sink -                  |      |      |      |      |      |      | 367     |
| Aggressive deployment - Corn-ethanol to          |      |      |      |      |      |      | 301     |
| energy grasses (1000 hectares)                   |      |      |      |      |      |      |         |
| Land impacted for carbon sink -                  |      |      |      | +    |      |      | 6,684   |
| Aggressive deployment - Cropland                 |      |      |      |      |      |      | 0,004   |
| measures (1000 hectares)                         |      |      |      |      |      |      |         |
| Land impacted for carbon sink -                  |      |      |      |      |      |      | 143     |
| Aggressive deployment - Cropland to              |      |      |      |      |      |      | 140     |
| woody energy crops (1000 hectares)               |      |      |      |      |      |      |         |
| Land impacted for carbon sink -                  |      |      |      |      |      |      | 440     |
| Aggressive deployment - Pasture to               |      |      |      |      |      |      | 770     |
| energy crops (1000 hectares)                     |      |      |      |      |      |      |         |
| Land impacted for carbon sink -                  |      |      |      | +    |      |      | 90.3    |
| Aggressive deployment - Permanent                |      |      |      |      |      |      | 70.3    |
| conservation cover (1000 hectares)               |      |      |      |      |      |      |         |
| Land impacted for carbon sink -                  |      |      |      |      |      | +    | 7,724   |
| Aggressive deployment - Total (1000              |      |      |      |      |      |      | 1,124   |
| hectares)  |      |      |      |      |      |      |         |
| nootai ooj                                       |      |      |      |      |      |      |         |

Table 56: E-B+ scenario - PILLAR 6: Land sinks - Agriculture (continued)

| Item                                     | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050  |
|--|------|------|------|------|------|------|-------|
| Land impacted for carbon sink - Moderate |      |      |      |      |      |      | 367   |
| deployment - Corn-ethanol to energy      |      |      |      |      |      |      |       |
| grasses (1000 hectares)                  |      |      |      |      |      |      |       |
| Land impacted for carbon sink - Moderate |      |      |      |      |      |      | 1,376 |
| deployment - Cropland measures (1000     |      |      |      |      |      |      |       |
| hectares)                                |      |      |      |      |      |      |       |
| Land impacted for carbon sink - Moderate |      |      |      |      |      |      | 143   |
| deployment - Cropland to woody energy    |      |      |      |      |      |      |       |
| crops (1000 hectares)                    |      |      |      |      |      |      |       |
| Land impacted for carbon sink - Moderate |      |      |      |      |      |      | 440   |
| deployment - Pasture to energy crops     |      |      |      |      |      |      |       |
| (1000 hectares)                          |      |      |      |      |      |      |       |
| Land impacted for carbon sink - Moderate |      |      |      |      |      |      | 45.1  |
| deployment - Permanent conservation      |      |      |      |      |      |      |       |
| cover (1000 hectares)                    |      |      |      |      |      |      |       |
| Land impacted for carbon sink - Moderate |      |      |      |      |      |      | 2,371 |
| deployment - Total (1000 hectares)       |      |      |      |      |      |      |       |

Table 57: E-B+ scenario - PILLAR 6: Land sinks - Forests

| Item                                      | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050    |
|---|------|------|------|------|------|------|---------|
| Carbon sink potential - High - Accelerate |      |      |      |      |      |      | -356    |
| regeneration (1000 tCO2e/y)               |      |      |      |      |      |      |         |
| Carbon sink potential - High - All (not   |      |      |      |      |      |      | -46,154 |
| counting overlap) (1000 tCO2e/y)          |      |      |      |      |      |      |         |
| Carbon sink potential - High - Avoid      |      |      |      |      |      |      | -1,334  |
| deforestation (1000 tCO2e/y)              |      |      |      |      |      |      |         |
| Carbon sink potential - High - Extend     |      |      |      |      |      |      | -9,22   |
| rotation length (1000 tCO2e/y)            |      |      |      |      |      |      |         |
| Carbon sink potential - High - Improve    |      |      |      |      |      |      | -3,044  |
| plantations (1000 tCO2e/y)                |      |      |      |      |      |      |         |
| Carbon sink potential - High - Increase   |      |      |      |      |      |      | -13,825 |
| retention of HWP (1000 tCO2e/y)           |      |      |      |      |      |      |         |
| Carbon sink potential - High - Increase   |      |      |      |      |      |      | -1,120  |
| trees outside forests (1000 tCO2e/y)      |      |      |      |      |      |      |         |
| Carbon sink potential - High - Reforest   |      |      |      |      |      |      | -1,077  |
| cropland (1000 tCO2e/y)                   |      |      |      |      |      |      |         |
| Carbon sink potential - High - Reforest   |      |      |      |      |      |      | -11,526 |
| pasture (1000 tCO2e/y)                    |      |      |      |      |      |      |         |
| Carbon sink potential - High - Restore    |      |      |      |      |      |      | -4,644  |
| productivity (1000 tCO2e/y)               |      |      |      |      |      |      |         |
| Carbon sink potential - Low - Accelerate  |      |      |      |      |      |      | -178    |
| regeneration (1000 tCO2e/y)               |      |      |      |      |      |      |         |
| Carbon sink potential - Low - All (not    |      |      |      |      |      |      | -13,47  |
| counting overlap) (1000 tCO2e/y)          |      |      |      |      |      |      |         |
| Carbon sink potential - Low - Avoid       |      |      |      |      |      |      | -222    |
| deforestation (1000 tCO2e/y)              |      |      |      |      |      |      |         |
| Carbon sink potential - Low - Extend      |      |      |      |      |      |      | -3,544  |
| rotation length (1000 tCO2e/y)            |      |      |      |      |      |      |         |
| Carbon sink potential - Low - Improve     |      |      |      |      |      |      | -1,549  |
| plantations (1000 tCO2e/y)                |      |      |      |      |      |      |         |
| Carbon sink potential - Low - Increase    |      |      |      |      |      |      | -4,608  |
| retention of HWP (1000 tCO2e/y)           |      |      |      |      |      |      |         |
| Carbon sink potential - Low - Increase    |      |      |      |      |      |      | -392    |
| trees outside forests (1000 tCO2e/y)      |      |      |      |      |      |      |         |
| Carbon sink potential - Low - Reforest    |      |      |      |      |      |      | -538    |
| cropland (1000 tCO2e/y)                   |      |      |      |      |      |      |         |
| Carbon sink potential - Low - Reforest    |      |      |      |      |      |      | -873    |
| pasture (1000 tC02e/y)                    |      |      |      |      |      |      |         |
| Carbon sink potential - Low - Restore     |      |      |      |      |      |      | -1,565  |
| productivity (1000 tCO2e/y)               |      |      |      |      |      |      |         |

Table 57: E-B+ scenario - PILLAR 6: Land sinks - Forests (continued)

| regeneration (1000 tC02e/y) Carbon sink potential - Mid - All (not counting overlap) (1000 tC02e/y) Carbon sink potential - Mid - Avoid deforestation (1000 tC02e/y) Carbon sink potential - Mid - Extend rotation length (1000 tC02e/y) Carbon sink potential - Mid - Extend rotation length (1000 tC02e/y) Carbon sink potential - Mid - Improve plantations (1000 tC02e/y) Carbon sink potential - Mid - Improve plantations (1000 tC02e/y) Carbon sink potential - Mid - Increase retention of HWP (1000 tC02e/y) Carbon sink potential - Mid - Increase retends of HWP (1000 tC02e/y) Carbon sink potential - Mid - Reforest resolution of the Company  | Item                                      | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050    |
|--|---|------|------|------|------|------|------|---------|
| Carbon sink potential - Mid - All (not counting overlap) (1000 tot2e/v) Carbon sink potential - Mid - Avoid deforestation (1000 tot2e/v) Carbon sink potential - Mid - Estend rotation length (1000 tot2e/v) Carbon sink potential - Mid - Estend rotation length (1000 tot2e/v) Carbon sink potential - Mid - Improve plantations (1000 tot2e/v) Carbon sink potential - Mid - Improve plantations (1000 tot2e/v) Carbon sink potential - Mid - Increase retention of HWP (1000 tot2e/v) Carbon sink potential - Mid - Increase retention of HWP (1000 tot2e/v) Carbon sink potential - Mid - Reforest roropland (1000 tot2e/v) Carbon sink potential - Mid - Reforest roropland (1000 tot2e/v) Carbon sink potential - Mid - Reforest roropland (1000 tot2e/v) Carbon sink potential - Mid - Reforest roropland (1000 tot2e/v) Carbon sink potential - Mid - Restore productivity (1000 tot2e/v) Land impacted for carbon sink potential - Migh - Avoid deforestation (1000 hectares) Land impacted for carbon sink potential - Migh - Avoid deforestation (1000 hectares) Land impacted for carbon sink potential - Migh - Land (1000 hectares) Land impacted for carbon sink potential - Migh - Ling (1000 hectares) Land impacted for carbon sink potential - Migh - Improve plantations (1000 hectares) Land impacted for carbon sink potential - Migh - Improve plantations (1000 hectares) Land impacted for carbon sink potential - Migh - Increase retention of HWP (1000 hectares) Land impacted for carbon sink potential - Migh - Increase reteres outside forests (1000 hectares) Land impacted for carbon sink potential - Migh - Reforest posture (1000 hectares) Land impacted for carbon sink potential - Migh - Reforest posture (1000 hectares) Land impacted for carbon sink potential - Migh - Reforest posture (1000 hectares) Land impacted for carbon sink potential - Migh - Reforest posture (1000 hectares) Land impacted for carbon sink potential - Migh - Reforest posture (1000 hectares) Land impacted for carbon sink potential - Migh - Reforest posture (1000 hectares) Land impacted for  | Carbon sink potential - Mid - Accelerate  |      |      |      |      |      |      | -267    |
| counting overlap) (1000 tC02e/v) Carbon sink potential - Mid - Avoid deforestation (1000 tC02e/v) Carbon sink potential - Mid - Extend rotation length (1000 tC02e/v) Carbon sink potential - Mid - Improve plantations (1000 tC02e/v) Carbon sink potential - Mid - Improve plantations (1000 tC02e/v) Carbon sink potential - Mid - Improve plantations (1000 tC02e/v) Carbon sink potential - Mid - Increase retention of HWP (1000 tC02e/v) Carbon sink potential - Mid - Increase rese outside forests (1000 tC02e/v) Carbon sink potential - Mid - Reforest reso dustide forests (1000 tC02e/v) Carbon sink potential - Mid - Reforest reposition (1000 tC02e/v) Carbon sink potential - Mid - Reforest reposition (1000 tC02e/v) Carbon sink potential - Mid - Reforest productivity (1000 tC02e/v) Carbon sink potential - Mid - Restore productivity (1000 tC02e/v) Land impacted for carbon sink potential - High - Accelerate regeneration (1000 hectares) Land impacted for carbon sink potential - High - Accelerate regeneration (1000 hectares) Land impacted for carbon sink potential - High - Extend rotation length (1000 hectares) Land impacted for carbon sink potential - High - Improve plantations (1000 hectares) Land impacted for carbon sink potential - High - Improve plantations (1000 hectares) Land impacted for carbon sink potential - High - Improve plantations (1000 hectares) Land impacted for carbon sink potential - High - Increase retention of HWP (1000 hectares) Land impacted for carbon sink potential - High - Increase retention of HWP (1000 hectares) Land impacted for carbon sink potential - High - Reforest cropland (1000 hectares) Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares) Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares) Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares) Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares) Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares) Land  |   |      |      |      |      |      |      |         |
| Carbon sink potential - Mid - Avoid deforestation (1000 tCO2e/y) Carbon sink potential - Mid - Extend rotation length (1000 tCO2e/y) Carbon sink potential - Mid - Extend rotation length (1000 tCO2e/y) Carbon sink potential - Mid - Improve plantations (1000 tCO2e/y) Carbon sink potential - Mid - Increase retention of HWP (1000 tCO2e/y) Carbon sink potential - Mid - Increase retention of HWP (1000 tCO2e/y) Carbon sink potential - Mid - Reforest teropland (1000 tCO2e/y) Carbon sink potential - Mid - Reforest teropland (1000 tCO2e/y) Carbon sink potential - Mid - Reforest pasture (1000 tCO2e/y) Carbon sink potential - Mid - Reforest pasture (1000 tCO2e/y) Land impacted for carbon sink potential - Migh - Avoid deforestation (1000 tCO2e/y) Land impacted for carbon sink potential - Migh - Avoid deforestation (1000 tCO2e/y) Land impacted for carbon sink potential - Migh - Avoid deforestation (1000 tCO2e/y) Land impacted for carbon sink potential - Migh - Land impacted for carbon sink potential - Migh - Land impacted for carbon sink potential - Migh - Land impacted for carbon sink potential - Migh - Improve plantations (1000 hectares) Land impacted for carbon sink potential - Migh - Improve plantations (1000 hectares) Land impacted for carbon sink potential - Migh - Increase retention of HWP (1000 hectares) Land impacted for carbon sink potential - Migh - Increase reseauction of HWP (1000 hectares) Land impacted for carbon sink potential - Migh - Reforest cropland (1000 hectares) Land impacted for carbon sink potential - Migh - Reforest cropland (1000 hectares) Land impacted for carbon sink potential - Migh - Reforest cropland (1000 hectares) Land impacted for carbon sink potential - Migh - Restore productivity (1000 hectares) Land impacted for carbon sink potential - Migh - Restore productivity (1000 hectares) Land impacted for carbon sink potential - Migh - Restore productivity (1000 hectares) Land impacted for carbon sink potential - Migh - Restore productivity (1000 hectares) Land impacted for carbon sink potential  |   |      |      |      |      |      |      | -29,786 |
| deforestation (1000 tC02e/y) Carbon sink potential - Mid - Extend rotation length (1000 tC02e/y) Carbon sink potential - Mid - Improve plantations (1000 tC02e/y) Carbon sink potential - Mid - Improve plantations (1000 tC02e/y) Carbon sink potential - Mid - Increase retention of HWP (1000 tC02e/y) Carbon sink potential - Mid - Increase retes outside forests (1000 tC02e/y) Carbon sink potential - Mid - Reforest repost (1000 tC02e/y) Carbon sink potential - Mid - Reforest repost (1000 tC02e/y) Carbon sink potential - Mid - Reforest repost (1000 tC02e/y) Carbon sink potential - Mid - Reforest repost (1000 tC02e/y) Carbon sink potential - Mid - Restore productivity (1000 tC02e/y) Carbon sink potential - Mid - Restore productivity (1000 tC02e/y) Carbon sink potential - Mid - Restore productivity (1000 tC02e/y) Carbon sink potential - Mid - Restore productivity (1000 tC02e/y) Carbon sink potential - Mid - Restore productivity (1000 tC02e/y) Carbon sink potential - Mid - Restore productivity (1000 tC02e/y) Carbon sink potential - Mid - Restore productivity (1000 tc02e/y) Carbon sink potential - Mid - Restore productivity (1000 tc02e/y) Carbon sink potential - Mid - Restore productivity (1000 tectares) Cland impacted for carbon sink potential - Mid - Restore productivity (1000 hectares) Land impacted for carbon sink potential - Mid - Increase retention of HWP (1000 hectares) Land impacted for carbon sink potential - Mid - Increase retention of HWP (1000 hectares) Land impacted for carbon sink potential - Mid - Reforest cropland (1000 hectares) Land impacted for carbon sink potential - Mid - Reforest cropland (1000 hectares) Land impacted for carbon sink potential - Mid - Reforest cropland (1000 hectares) Land impacted for carbon sink potential - Mid - Reforest cropland (1000 hectares) Land impacted for carbon sink potential - Mid - Reforest cropland (1000 hectares) Land impacted for carbon sink potential - Mid - Reforest cropland (1000 hectares) Land impacted for carbon sink potential - Mid - Reforest cropland (1000 hec |   |      |      |      |      |      |      |         |
| Carbon sink potential - Mid - Extend rotation length (1000 tCO2e/v)  Carbon sink potential - Mid - Improve plantations (1000 to CO2e/v)  Carbon sink potential - Mid - Increase retention of HWP (1000 tCO2e/v)  Carbon sink potential - Mid - Increase retend of HWP (1000 tCO2e/v)  Carbon sink potential - Mid - Increase trees outside forests (1000 tCO2e/v)  Carbon sink potential - Mid - Reforest cropland (1000 tCO2e/v)  Carbon sink potential - Mid - Reforest cropland (1000 tCO2e/v)  Carbon sink potential - Mid - Reforest productivity (1000 tCO2e/v)  Carbon sink potential - Mid - Restoree productivity (1000 tCO2e/v)  Carbon sink potential - Mid - Restoree productivity (1000 tCO2e/v)  Land impacted for carbon sink potential - High - Avoid deforestation (1000 hettares)  Land impacted for carbon sink potential - High - Avoid deforestation (over 30 years) (1000 hettares)  Land impacted for carbon sink potential - High - Increase trees outside forest (1000 hettares)  Land impacted for carbon sink potential - High - Increase retention of HWP (1000 hettares)  Land impacted for carbon sink potential - High - Increase retention of HWP (1000 hettares)  Land impacted for carbon sink potential - High - Increase trees outside forests (1000 hectares)  Land impacted for carbon sink potential - High - Reforest cropland (1000 hectares)  Land impacted for carbon sink potential - High - Reforest cropland (1000 hectares)  Land impacted for carbon sink potential - High - Reforest cropland (1000 hectares)  Land impacted for carbon sink potential - High - Restorest cropland (1000 hectares)  Land impacted for carbon sink potential - High - Restorest cropland (1000 hectares)  Land impacted for carbon sink potential - High - Restorest cropland (1000 hectares)  Land impacted for carbon sink potential - High - Restorest cropland (1000 hectares)  Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)                           | ·   |      |      |      |      |      |      | -778    |
| rotation length (1000 tC02e/y) Carbon sink potential - Mid - Improve plantations (1000 tC02e/y) Carbon sink potential - Mid - Increase retention of HWP (1000 tC02e/y) Carbon sink potential - Mid - Increase trees outside forests (1000 tC02e/y) Carbon sink potential - Mid - Reforest cropland (1000 tC02e/y) Carbon sink potential - Mid - Reforest cropland (1000 tC02e/y) Carbon sink potential - Mid - Reforest pasture (1000 tC02e/y) Carbon sink potential - Mid - Reforest pasture (1000 tC02e/y) Carbon sink potential - Mid - Reforest pasture (1000 tC02e/y) Carbon sink potential - Mid - Restore productivity (1000 tC02e/y) Carbon sink potential - Mid - Restore productivity (1000 tC02e/y) Carbon sink potential - Mid - Restore productivity (1000 tC02e/y) Carbon sink potential - Mid - Restore productivity (1000 tc02e/y) Carbon sink potential - Mid - Restore productivity (1000 tc02e/y) Carbon sink potential - Mid - Restore productivity (1000 tc02e/y) Carbon sink potential - Mid - Restore productivity (1000 tc02e/y) Carbon sink potential - Mid - Restore productivity (1000 tc02e/y) Carbon sink potential - Mid - Restore productivity (1000 tc02e/y) Carbon sink potential - Mid - Restore productivity (1000 hectares) Land impacted for carbon sink potential - Mid - Restore corpland (1000 hectares) Land impacted for carbon sink potential - Mid - Restore productivity (1000 hectares) Land impacted for carbon sink potential - Mid - Restore productivity (1000 hectares) Land impacted for carbon sink potential - Mid - Restore productivity (1000 hectares) Land impacted for carbon sink potential - Mid - Restore productivity (1000 hectares) Land impacted for carbon sink potential - Mid - Restore productivity (1000 hectares) Land impacted for carbon sink potential - Mid - Restore productivity (1000 hectares) Land impacted for carbon sink potential - Mid - Restore productivity (1000 hectares) Land impacted for carbon sink potential - Mid - Restore productivity (1000 hectares) Land impacted for carbon sink potential - Mid - Restore productivity  |   |      |      |      |      |      |      |         |
| Carbon sink potential - Mid - Improve plantations (1000 t002e/y) Carbon sink potential - Mid - Increase retention of HWP (1000 c002e/y) Carbon sink potential - Mid - Increase trees outside forests (1000 t002e/y) Carbon sink potential - Mid - Increase trees outside forests (1000 t002e/y) Carbon sink potential - Mid - Reforest corpland (1000 t002e/y) Carbon sink potential - Mid - Reforest pasture (1000 c002e/y) Carbon sink potential - Mid - Reforest productivity (1000 c002e/y) Carbon sink potential - Mid - Restore productivity (1000 c002e/y) Carbon sink potential - Mid - Restore productivity (1000 c002e/y) Carbon sink potential - Mid - Restore productivity (1000 c002e/y) Land impacted for carbon sink potential - Migh - Avoid deforestation (over 30 years) (1000 hectares) Land impacted for carbon sink potential - Migh - Avoid deforestation (over 30 years) (1000 hectares) Land impacted for carbon sink potential - Migh - Extend rotation length (1000 hectares) Land impacted for carbon sink potential - Migh - Increase retention of HWP (1000 hectares) Land impacted for carbon sink potential - Migh - Increase retention of HWP (1000 hectares) Land impacted for carbon sink potential - Migh - Increase trees outside forests (1000 hectares) Land impacted for carbon sink potential - Migh - Reforest cropland (1000 hectares) Land impacted for carbon sink potential - Migh - Reforest cropland (1000 hectares) Land impacted for carbon sink potential - Migh - Reforest cropland (1000 hectares) Land impacted for carbon sink potential - Migh - Reforest cropland (1000 hectares) Land impacted for carbon sink potential - Migh - Reforest cropland (1000 hectares) Land impacted for carbon sink potential - Migh - Reforest cropland (1000 hectares) Land impacted for carbon sink potential - Migh - Reforest cropland (1000 hectares) Land impacted for carbon sink potential - Migh - Reforest cropland (1000 hectares) Land impacted for carbon sink potential - Migh - Reforest corpland (1000 hectares) Land impacted for carbon sink potential - Migh - Refo | Carbon sink potential - Mid - Extend      |      |      |      |      |      |      | -6,386  |
| plantations (1000 LCO2e/y) Carbon sink potential - Mid - Increase retention of HWP (1000 tCO2e/y) Carbon sink potential - Mid - Increase trees outside forests (1000 tCO2e/y) Carbon sink potential - Mid - Reforest cropland (1000 tCO2e/y) Carbon sink potential - Mid - Reforest cropland (1000 tCO2e/y) Carbon sink potential - Mid - Reforest productivity (1000 tCO2e/y) Carbon sink potential - Mid - Restore productivity (1000 tCO2e/y) Carbon sink potential - Mid - Restore productivity (1000 tCO2e/y) Carbon sink potential - Mid - Restore productivity (1000 tCO2e/y) Carbon sink potential - Mid - Restore productivity (1000 tCO2e/y) Carbon sink potential - Mid - Restore productivity (1000 tCO2e/y) Carbon sink potential - Mid - Accelerate regeneration (1000 hectares) Land impacted for carbon sink potential - Mid - Avoid deforestation (over 30 years) (1000 hectares) Land impacted for carbon sink potential - Migh - Increase retention of HWP (1000 hectares) Land impacted for carbon sink potential - Migh - Increase rese outside forests (1000 hectares) Land impacted for carbon sink potential - Migh - Increase rese outside forests (1000 hectares) Land impacted for carbon sink potential - Migh - Reroset possible forests (1000 hectares) Land impacted for carbon sink potential - Migh - Reroset possible forests (1000 hectares) Land impacted for carbon sink potential - Migh - Reroset possible forests (1000 hectares) Land impacted for carbon sink potential - Migh - Restore productivity (1000 hectares) Land impacted for carbon sink potential - Migh - Restore productivity (1000 hectares) Land impacted for carbon sink potential - Migh - Restore productivity (1000 hectares) Land impacted for carbon sink potential - Migh - Restore productivity (1000 hectares) Land impacted for carbon sink potential - Migh - Restore productivity (1000 hectares) Land impacted for carbon sink potential - Migh - Restore productivity (1000 hectares) Land impacted for carbon sink potential - Migh - Restore productivity (1000 hectares) Land impacted for carbon s |   |      |      |      |      |      |      |         |
| Carbon sink potential - Mid - Increase retention of HWP (1000 tCO2e/y) Carbon sink potential - Mid - Increase trees outside forests (1000 tCO2e/y) Carbon sink potential - Mid - Reforest cropland (1000 tCO2e/y) Carbon sink potential - Mid - Reforest cropland (1000 tCO2e/y) Carbon sink potential - Mid - Restore productivity (1000 tCO2e/y) Carbon sink potential - Mid - Restore productivity (1000 tCO2e/y) Land impacted for carbon sink potential - Migh - Restore productivity (1000 tCO2e/y) Land impacted for carbon sink potential - Migh - Avoid deforestation (over S0 years) (1000 hectares) Land impacted for carbon sink potential - Migh - Avoid deforestation (over S0 years) (1000 hectares) Land impacted for carbon sink potential - Migh - Improve plantations (1000 hectares) Land impacted for carbon sink potential - Migh - Improve plantations (1000 hectares) Land impacted for carbon sink potential - Migh - Improve plantations (1000 hectares) Land impacted for carbon sink potential - Migh - Improve plantations (1000 hectares) Land impacted for carbon sink potential - Migh - Reforest cropland (1000 hectares) Land impacted for carbon sink potential - Migh - Reforest cropland (1000 hectares) Land impacted for carbon sink potential - Migh - Reforest cropland (1000 hectares) Land impacted for carbon sink potential - Migh - Reforest cropland (1000 hectares) Land impacted for carbon sink potential - Migh - Reforest cropland (1000 hectares) Land impacted for carbon sink potential - Migh - Reforest cropland (1000 hectares) Land impacted for carbon sink potential - Migh - Reforest cropland (1000 hectares) Land impacted for carbon sink potential - Migh - Reforest cropland (1000 hectares) Land impacted for carbon sink potential - Migh - Reforest cropland (1000 hectares) Land impacted for carbon sink potential - Migh - Reforest cropland (1000 hectares) Land impacted for carbon sink potential - Migh - Reforest cropland (1000 hectares) Land impacted for carbon sink potential - Migh - Accelerate regeneration (1000 hectares)              | Carbon sink potential - Mid - Improve     |      |      |      |      |      |      | -2,270  |
| retention of HWP (1000 LCO2e/y) Carbon sink potential - Mid - Reforest trees outside forests (1000 tCO2e/y) Carbon sink potential - Mid - Reforest cropland (1000 tCO2e/y) Carbon sink potential - Mid - Reforest cropland (1000 tCO2e/y) Carbon sink potential - Mid - Reforest productivity (1000 tCO2e/y) Carbon sink potential - Mid - Restore productivity (1000 tCO2e/y) Carbon sink potential - Mid - Restore productivity (1000 tCO2e/y) Carbon sink potential - Mid - Restore productivity (1000 tCO2e/y) Carbon sink potential - Mid - Restore productivity (1000 tCO2e/y) Carbon sink potential - Mid - Restore productivity (1000 tCO2e/y) Carbon sink potential - Mid - Accelerate regeneration (1000 hectares) Land impacted for carbon sink potential - Migh - Accelerate regeneration (1000 hectares) Land impacted for carbon sink potential - Migh - Improve plantations (1000 hectares) Land impacted for carbon sink potential - Migh - Improve plantations (1000 hectares) Land impacted for carbon sink potential - Migh - Increase retention of HWP (1000 hectares) Land impacted for carbon sink potential - Migh - Increase rese outside forests (1000 hectares) Land impacted for carbon sink potential - Migh - Reforest cropland (1000 hectares) Land impacted for carbon sink potential - Migh - Reforest pasture (1000 hectares) Land impacted for carbon sink potential - Migh - Reforest pasture (1000 hectares) Land impacted for carbon sink potential - Migh - Reforest pasture (1000 hectares) Land impacted for carbon sink potential - Migh - Reforest pasture (1000 hectares) Land impacted for carbon sink potential - Migh - Reforest pasture (1000 hectares) Land impacted for carbon sink potential - Migh - Reforest pasture (1000 hectares) Land impacted for carbon sink potential - Migh - Reforest pasture (1000 hectares) Land impacted for carbon sink potential - Migh - Reforest pasture (1000 hectares) Land impacted for carbon sink potential - Migh - Reforest pasture (1000 hectares) Land impacted for carbon sink potential - Migh - Reforest pasture (1000 hectare | plantations (1000 tCO2e/y)                |      |      |      |      |      |      |         |
| Carbon sink potential - Mid - Increase trees outside forests (1000 tC02e/v) Carbon sink potential - Mid - Reforest cropland (1000 tC02e/v) Carbon sink potential - Mid - Reforest cropland (1000 tC02e/v) Carbon sink potential - Mid - Reforest pasture (1000 tC02e/v) Carbon sink potential - Mid - Restore productivity (1000 tC02e/v) Carbon sink potential - Mid - Restore productivity (1000 tC02e/v) Land impacted for carbon sink potential - High - Acoclerate regeneration (1000 hectares) Land impacted for carbon sink potential - High - Avoid deforestation (over 30 years) (1000 hectares) Land impacted for carbon sink potential - High - Extend rotation length (1000 hectares) Land impacted for carbon sink potential - High - Improve plantations (1000 hectares) Land impacted for carbon sink potential - High - Improve plantations (1000 hectares) Land impacted for carbon sink potential - High - Increase retention of HWP (1000 hectares) Land impacted for carbon sink potential - High - Increase retention of HWP (1000 hectares) Land impacted for carbon sink potential - High - Reforest cropland (1000 hectares) Land impacted for carbon sink potential - High - Reforest cropland (1000 hectares) Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares) Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares) Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares) Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares) Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares) Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares) Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares) Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares) Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares) Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)                  | Carbon sink potential - Mid - Increase    |      |      |      |      |      |      | -9,217  |
| trees outside forests (1000 tcO2e/y) Carbon sink potential - Mid - Reforest cropland (1000 tcO2e/y) Carbon sink potential - Mid - Reforest pasture (1000 tcO2e/y) Carbon sink potential - Mid - Restore productivity (1000 tcO2e/y) Carbon sink potential - Mid - Restore productivity (1000 tcO2e/y) Carbon sink potential - Mid - Restore productivity (1000 tcO2e/y) Land impacted for carbon sink potential - High - Accelerate regeneration (1000 hectares) Land impacted for carbon sink potential - High - Avoid deforestation (over 30 years) (1000 hectares) Land impacted for carbon sink potential - High - Extend rotation length (1000 hectares) Land impacted for carbon sink potential - High - Improve plantations (1000 hectares) Land impacted for carbon sink potential - High - Increase retention of HWP (1000 hectares) Land impacted for carbon sink potential - High - Increase retention of HWP (1000 hectares) Land impacted for carbon sink potential - High - Increase retension of hwe (1000 hectares) Land impacted for carbon sink potential - High - Reforest cropland (1000 hectares) Land impacted for carbon sink potential - High - Reforest possible potential -  | retention of HWP (1000 tCO2e/y)           |      |      |      |      |      |      |         |
| Carbon sink potential - Mid - Reforest cropland (1000 tC02e/y) Carbon sink potential - Mid - Reforest  | Carbon sink potential - Mid - Increase    |      |      |      |      |      |      | -756    |
| Carbon sink potential - Mid - Reforest cropland (1000 tC02e/y) Carbon sink potential - Mid - Reforest  | trees outside forests (1000 tCO2e/y)      |      |      |      |      |      |      |         |
| cropland (1000 tCO2e/y) Carbon sink potential - Mid - Reforest pasture (1000 tCO2e/y) Carbon sink potential - Mid - Restore productivity (1000 tCO2e/y) Land impacted for carbon sink potential - High - Accelerate regeneration (1000 hectares) Land impacted for carbon sink potential - High - Accelerate regeneration (1000 hectares) Land impacted for carbon sink potential - High - Avoid deforestation (over 30 years) (1000 hectares) Land impacted for carbon sink potential - High - Extend rotation length (1000 hectares) Land impacted for carbon sink potential - High - Improve plantations (1000 hectares) Land impacted for carbon sink potential - High - Increase retention of HWP (1000 hectares) Land impacted for carbon sink potential - High - Increase trees outside forests (1000 hectares) Land impacted for carbon sink potential - High - Reforest cropland (1000 hectares) Land impacted for carbon sink potential - High - Reforest cropland (1000 hectares) Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares) Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares) Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares) Land impacted for carbon sink potential - High - Restore productivity (1000 hectares) Land impacted for carbon sink potential - High - Total impacted (over 30 years) (1000 hectares) Land impacted for carbon sink potential - Land impacted for carbon sink potential - Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares) Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares) Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares) Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)   |   |      |      |      |      |      |      | -807    |
| Carbon sink potential - Mid - Reforest pasture (1000 tc02e/y)  Carbon sink potential - Mid - Restore productivity (1000 tc02e/y)  Land impacted for carbon sink potential - High - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - High - Avoid deforestation (over 30 years) (1000 hectares)  Land impacted for carbon sink potential - High - Extend rotation length (1000 hectares)  Land impacted for carbon sink potential - High - Improve plantations (1000 hectares)  Land impacted for carbon sink potential - High - Increase retention of HWP (1000 hectares)  Land impacted for carbon sink potential - High - Increase retention of HWP (1000 hectares)  Land impacted for carbon sink potential - High - Reforest cropland (1000 hectares)  Land impacted for carbon sink potential - High - Reforest cropland (1000 hectares)  Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares)  Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares)  Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares)  Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares)  Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares)  Land impacted for carbon sink potential - High - Restore productivity (1000 hectares)  Land impacted for carbon sink potential - High - Total impacted (over 30 years) (1000 hectares)  Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)   | ·   |      |      |      |      |      |      |         |
| pasture (1000 tC02e/y) Carbon sink potential - Mid - Restore productivity (1000 tC02e/y) Land impacted for carbon sink potential - High - Accelerate regeneration (1000 hectares) Land impacted for carbon sink potential - High - Avoid deforestation (over 30 years) (1000 hectares) Land impacted for carbon sink potential - High - Land impacted for carbon sink potential - High - Improve plantations (1000 hectares) Land impacted for carbon sink potential - High - Improve plantations (1000 hectares) Land impacted for carbon sink potential - High - Increase retention of HWP (1000 hectares) Land impacted for carbon sink potential - High - Increase trees outside forests (1000 hectares) Land impacted for carbon sink potential - High - Reforest cropland (1000 hectares) Land impacted for carbon sink potential - High - Reforest cropland (1000 hectares) Land impacted for carbon sink potential - High - Reforest cropland (1000 hectares) Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares) Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares) Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares) Land impacted for carbon sink potential - High - Restore productivity (1000 hectares) Land impacted for carbon sink potential - High - Total impacted (over 30 years) (1000 hectares) Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares) Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares) Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares) Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares) Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares) Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)  |   |      |      |      |      |      |      | -6,200  |
| Carbon sink potential - Mid - Restore productivity (1000 tC02e/y)  Land impacted for carbon sink potential - High - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - High - Avoid deforestation (over 30 years) (1000 hectares)  Land impacted for carbon sink potential - High - Extend rotation length (1000 hectares)  Land impacted for carbon sink potential - High - Improve plantations (1000 hectares)  Land impacted for carbon sink potential - High - Improve plantations (1000 hectares)  Land impacted for carbon sink potential - High - Increase retention of HWP (1000 hectares)  Land impacted for carbon sink potential - High - Increase trees outside forests (1000 hectares)  Land impacted for carbon sink potential - High - Reforest cropland (1000 hectares)  Land impacted for carbon sink potential - High - Reforest cropland (1000 hectares)  Land impacted for carbon sink potential - High - Restore productivity (1000 hectares)  Land impacted for carbon sink potential - High - Restore productivity (1000 hectares)  Land impacted for carbon sink potential - High - Restore productivity (1000 hectares)  Land impacted for carbon sink potential - High - Total impacted (over 30 years) (1000 hectares)  Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)   | ·   |      |      |      |      |      |      |         |
| productivity (1000 tc02e/y) Land impacted for carbon sink potential - High - Accelerate regeneration (1000 hectares) Land impacted for carbon sink potential - High - Avoid deforestation (over 30 years) (1000 hectares) Land impacted for carbon sink potential - High - Extend rotation length (1000 hectares) Land impacted for carbon sink potential - High - Increase retention of HWP (1000 hectares) Land impacted for carbon sink potential - High - Increase retention of HWP (1000 hectares) Land impacted for carbon sink potential - High - Increase trees outside forests (1000 hectares) Land impacted for carbon sink potential - High - Reforest cropland (1000 hectares) Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares) Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares) Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares) Land impacted for carbon sink potential - High - Restore productivity (1000 hectares) Land impacted for carbon sink potential - High - Total impacted (over 30 years) (1000 hectares) Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares) Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares) Land impacted for carbon sink potential - Low - Avoid deforestation (over 30 years) (1000 hectares)   |   |      |      |      |      |      |      | -3,105  |
| Land impacted for carbon sink potential - High - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - High - Avoid deforestation (over 30 years) (1000 hectares)  Land impacted for carbon sink potential - High - Extend rotation length (1000 hectares)  Land impacted for carbon sink potential - High - Improve plantations (1000 hectares)  Land impacted for carbon sink potential - High - Increase retention of HWP (1000 hectares)  Land impacted for carbon sink potential - High - Increase retention of HWP (1000 hectares)  Land impacted for carbon sink potential - High - Increase trees outside forests (1000 hectares)  Land impacted for carbon sink potential - High - Reforest cropland (1000 hectares)  Land impacted for carbon sink potential - High - Reforest posture (1000 hectares)  Land impacted for carbon sink potential - High - Restore productivity (1000 hectares)  Land impacted for carbon sink potential - High - Restore productivity (1000 hectares)  Land impacted for carbon sink potential - High - Total impacted (over 30 years) (1000 hectares)  Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)  |   |      |      |      |      |      |      | 37.33   |
| High - Accelerate regeneration (1000 hectares) Land impacted for carbon sink potential - High - Avoid deforestation (over 30 years) (1000 hectares) Land impacted for carbon sink potential - High - Extend rotation length (1000 hectares) Land impacted for carbon sink potential - High - Improve plantations (1000 hectares) Land impacted for carbon sink potential - High - Increase retention of HWP (1000 hectares) Land impacted for carbon sink potential - High - Increase trees outside forests (1000 hectares) Land impacted for carbon sink potential - High - Increase trees outside forests (1000 hectares) Land impacted for carbon sink potential - High - Reforest cropland (1000 hectares) Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares) Land impacted for carbon sink potential - High - Restore productivity (1000 hectares) Land impacted for carbon sink potential - High - Restorest productivity (1000 hectares) Land impacted for carbon sink potential - High - Total impacted (over 30 years) (1000 hectares) Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares) Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares) Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares) Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares) Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares) Land impacted for carbon sink potential - Low - Avoid deforestation (over 30 years) (1000 hectares)   |   |      |      |      |      |      |      | 58.3    |
| hectares) Land impacted for carbon sink potential - High - Avoid deforestation (over 30 years) (1000 hectares)  Land impacted for carbon sink potential - High - Extend rotation length (1000 hectares)  Land impacted for carbon sink potential - High - Improve plantations (1000 hectares)  Land impacted for carbon sink potential - High - Increase retention of HWP (1000 hectares)  Land impacted for carbon sink potential - High - Increase trees outside forests (1000 hectares)  Land impacted for carbon sink potential - High - Increase trees outside forests (1000 hectares)  Land impacted for carbon sink potential - High - Reforest cropland (1000 hectares)  Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares)  Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares)  Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares)  Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares)  Land impacted for carbon sink potential - High - Total impacted (over 30 years) (1000 hectares)  Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)   |   |      |      |      |      |      |      | 00.0    |
| Land impacted for carbon sink potential - High - Avoid deforestation (over 30 years) (1000 hectares)  Land impacted for carbon sink potential - High - Extend rotation length (1000 hectares)  Land impacted for carbon sink potential - High - Improve plantations (1000 hectares)  Land impacted for carbon sink potential - High - Increase retention of HWP (1000 hectares)  Land impacted for carbon sink potential - High - Increase trees outside forests (1000 hectares)  Land impacted for carbon sink potential - High - Increase trees outside forests (1000 hectares)  Land impacted for carbon sink potential - High - Reforest cropland (1000 hectares)  Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares)  Land impacted for carbon sink potential - High - Restore productivity (1000 hectares)  Land impacted for carbon sink potential - High - Restore productivity (1000 hectares)  Land impacted for carbon sink potential - High - Total impacted (over 30 years) (1000 hectares)  Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - Low - Avoid deforestation (over 30 years) (1000 hectares)  |   |      |      |      |      |      |      |         |
| High - Avoid deforestation (over 30 years) (1000 hectares)  Land impacted for carbon sink potential - High - Extend rotation length (1000 hectares)  Land impacted for carbon sink potential - High - Improve plantations (1000 hectares)  Land impacted for carbon sink potential - High - Increase retention of HWP (1000 hectares)  Land impacted for carbon sink potential - High - Increase trees outside forests (1000 hectares)  Land impacted for carbon sink potential - High - Reforest cropland (1000 hectares)  Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares)  Land impacted for carbon sink potential - High - Restore productivity (1000 hectares)  Land impacted for carbon sink potential - High - Total impacted for carbon sink potential - High - Total impacted for carbon sink potential - High - Total impacted for carbon sink potential - Land impacted for carbon sink potential - Land impacted for carbon sink potential - Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - Low - Avoid deforestation (over 30 years) (1000 hectares)  Land impacted for carbon sink potential - Low - Avoid deforestation (over 30 years) (1000 hectares)  |   |      | +    | +    |      |      |      | 181     |
| Circle   Content   Conte   |   |      |      |      |      |      |      | 101     |
| Land impacted for carbon sink potential - High - Extend rotation length (1000 hectares)  Land impacted for carbon sink potential - High - Improve plantations (1000 hectares)  Land impacted for carbon sink potential - High - Increase retention of HWP (1000 hectares)  Land impacted for carbon sink potential - High - Increase trees outside forests (1000 hectares)  Land impacted for carbon sink potential - High - Reforest cropland (1000 hectares)  Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares)  Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares)  Land impacted for carbon sink potential - High - Restore productivity (1000 hectares)  Land impacted for carbon sink potential - High - Total impacted (over 30 years) (1000 hectares)  Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)   |   |      |      |      |      |      |      |         |
| High - Extend rotation length (1000 hectares)  Land impacted for carbon sink potential - High - Improve plantations (1000 hectares)  Land impacted for carbon sink potential - High - Increase retention of HWP (1000 hectares)  Land impacted for carbon sink potential - High - Increase trees outside forests (1000 hectares)  Land impacted for carbon sink potential - High - Reforest cropland (1000 hectares)  Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares)  Land impacted for carbon sink potential - High - Restore productivity (1000 hectares)  Land impacted for carbon sink potential - High - Total impacted (over 30 years) (1000 hectares)  Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - Low - Avoid deforestation (over 30 years) (1000 hectares)  | 7   |      | +    | +    |      |      |      | 4,705   |
| hectares) Land impacted for carbon sink potential - High - Improve plantations (1000 hectares)  Land impacted for carbon sink potential - High - Increase retention of HWP (1000 hectares)  Land impacted for carbon sink potential - High - Increase trees outside forests (1000 hectares)  Land impacted for carbon sink potential - High - Reforest cropland (1000 hectares)  Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares)  Land impacted for carbon sink potential - High - Restore productivity (1000 hectares)  Land impacted for carbon sink potential - High - Total impacted (over 30 years) (1000 hectares)  Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - Low - Avoid deforestation (over 30 years) (1000 hectares)   |   |      |      |      |      |      |      | 4,105   |
| Land impacted for carbon sink potential - High - Improve plantations (1000 hectares)  Land impacted for carbon sink potential - High - Increase retention of HWP (1000 hectares)  Land impacted for carbon sink potential - High - Increase trees outside forests (1000 hectares)  Land impacted for carbon sink potential - High - Reforest cropland (1000 hectares)  Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares)  Land impacted for carbon sink potential - High - Restore productivity (1000 hectares)  Land impacted for carbon sink potential - High - Total impacted (over 30 years) (1000 hectares)  Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - Low - Avoid deforestation (over 30 years) (1000 hectares)   |   |      |      |      |      |      |      |         |
| High - Improve plantations (1000 hectares)  Land impacted for carbon sink potential - High - Increase retention of HWP (1000 hectares)  Land impacted for carbon sink potential - High - Increase trees outside forests (1000 hectares)  Land impacted for carbon sink potential - High - Reforest cropland (1000 hectares)  Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares)  Land impacted for carbon sink potential - High - Restore productivity (1000 hectares)  Land impacted for carbon sink potential - High - Total impacted (over 30 years) (1000 hectares)  Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - Low - Avoid deforestation (over 30 years) (1000 hectares)   | -   |      |      |      |      |      |      | 1,121   |
| hectares) Land impacted for carbon sink potential - High - Increase retention of HWP (1000 hectares)  Land impacted for carbon sink potential - High - Increase trees outside forests (1000 hectares)  Land impacted for carbon sink potential - High - Reforest cropland (1000 hectares)  Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares)  Land impacted for carbon sink potential - High - Restore productivity (1000 hectares)  Land impacted for carbon sink potential - High - Total impacted (over 30 years) (1000 hectares)  Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - Low - Avoid deforestation (over 30 years) (1000 hectares)   |   |      |      |      |      |      |      | 1,121   |
| Land impacted for carbon sink potential - High - Increase retention of HWP (1000 hectares)  Land impacted for carbon sink potential - High - Increase trees outside forests (1000 hectares)  Land impacted for carbon sink potential - High - Reforest cropland (1000 hectares)  Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares)  Land impacted for carbon sink potential - High - Restore productivity (1000 hectares)  Land impacted for carbon sink potential - High - Total impacted (over 30 years) (1000 hectares)  Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - Low - Avoid deforestation (over 30 years) (1000 hectares)   |   |      |      |      |      |      |      |         |
| High - Increase retention of HWP (1000 hectares)  Land impacted for carbon sink potential - High - Increase trees outside forests (1000 hectares)  Land impacted for carbon sink potential - High - Reforest cropland (1000 hectares)  Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares)  Land impacted for carbon sink potential - High - Restore productivity (1000 hectares)  Land impacted for carbon sink potential - High - Total impacted (over 30 years) (1000 hectares)  Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - Low - Avoid deforestation (over 30 years) (1000 hectares)   |   |      |      |      |      |      |      | 0       |
| Land impacted for carbon sink potential - High - Increase trees outside forests (1000 hectares)  Land impacted for carbon sink potential - High - Reforest cropland (1000 hectares)  Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares)  Land impacted for carbon sink potential - High - Restore productivity (1000 hectares)  Land impacted for carbon sink potential - High - Total impacted (over 30 years) (1000 hectares)  Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - Low - Avoid deforestation (over 30 years) (1000 hectares)   |   |      |      |      |      |      |      | 0       |
| Land impacted for carbon sink potential - High - Increase trees outside forests (1000 hectares)  Land impacted for carbon sink potential - High - Reforest cropland (1000 hectares)  Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares)  Land impacted for carbon sink potential - High - Restore productivity (1000 hectares)  Land impacted for carbon sink potential - High - Total impacted (over 30 years) (1000 hectares)  Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - Low - Avoid deforestation (over 30 years) (1000 hectares)   | -   |      |      |      |      |      |      |         |
| High - Increase trees outside forests [1000 hectares]  Land impacted for carbon sink potential - High - Reforest cropland (1000 hectares)  Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares)  Land impacted for carbon sink potential - High - Restore productivity (1000 hectares)  Land impacted for carbon sink potential - High - Total impacted (over 30 years) [1000 hectares)  Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - Low - Avoid deforestation (over 30 years) [1000 hectares]   |   |      |      |      |      |      |      | 10/     |
| [1000 hectares]  Land impacted for carbon sink potential - High - Reforest cropland (1000 hectares)  Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares)  Land impacted for carbon sink potential - High - Restore productivity (1000 hectares)  Land impacted for carbon sink potential - High - Total impacted (over 30 years) (1000 hectares)  Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - Low - Avoid deforestation (over 30 years) (1000 hectares)   |   |      |      |      |      |      |      | 106     |
| Land impacted for carbon sink potential - High - Reforest cropland (1000 hectares)  Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares)  Land impacted for carbon sink potential - High - Restore productivity (1000 hectares)  Land impacted for carbon sink potential - High - Total impacted (over 30 years) (1000 hectares)  Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - Low - Avoid deforestation (over 30 years) (1000 hectares)  |   |      |      |      |      |      |      |         |
| High - Reforest cropland (1000 hectares)  Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares)  Land impacted for carbon sink potential - High - Restore productivity (1000 hectares)  Land impacted for carbon sink potential - High - Total impacted (over 30 years) (1000 hectares)  Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - Low - Avoid deforestation (over 30 years) (1000 hectares)  | 7   |      |      |      |      |      |      |         |
| Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares)  Land impacted for carbon sink potential - High - Restore productivity (1000 hectares)  Land impacted for carbon sink potential - High - Total impacted (over 30 years) [1000 hectares)  Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - Low - Avoid deforestation (over 30 years) [1000 hectares)  |   |      |      |      |      |      |      | 71.2    |
| High - Reforest pasture (1000 hectares)  Land impacted for carbon sink potential - High - Restore productivity (1000 hectares)  Land impacted for carbon sink potential - High - Total impacted (over 30 years) (1000 hectares)  Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - Low - Avoid deforestation (over 30 years) (1000 hectares)  |   |      |      |      |      |      |      |         |
| Land impacted for carbon sink potential - High - Restore productivity (1000 hectares)  Land impacted for carbon sink potential - High - Total impacted (over 30 years) (1000 hectares)  Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - Low - Avoid deforestation (over 30 years) (1000 hectares)   |   |      |      |      |      |      |      | 327     |
| High - Restore productivity (1000 hectares)  Land impacted for carbon sink potential - High - Total impacted (over 30 years) (1000 hectares)  Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - Low - Avoid deforestation (over 30 years) (1000 hectares)   |   |      |      |      |      |      |      |         |
| hectares)  Land impacted for carbon sink potential - High - Total impacted (over 30 years) [1000 hectares]  Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - Low - Avoid deforestation (over 30 years) [1000 hectares]   |   |      |      |      |      |      |      | 1,539   |
| Land impacted for carbon sink potential - High - Total impacted (over 30 years) [1000 hectares]  Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - Low - Avoid deforestation (over 30 years) [1000 hectares]  |   |      |      |      |      |      |      |         |
| High - Total impacted (over 30 years) [1000 hectares]  Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - Low - Avoid deforestation (over 30 years) [1000 hectares]  |   |      |      |      |      |      |      |         |
| (1000 hectares)  Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - Low - Avoid deforestation (over 30 years) (1000 hectares)  | Land impacted for carbon sink potential - |      |      |      |      |      |      | 8,110   |
| Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - Low - Avoid deforestation (over 30 years) (1000 hectares)   | High - Total impacted (over 30 years)     |      |      |      |      |      |      |         |
| Low - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - Low - Avoid deforestation (over 30 years) (1000 hectares)   |   |      |      |      |      |      |      |         |
| hectares)  Land impacted for carbon sink potential - Low - Avoid deforestation (over 30 years) (1000 hectares)   | Land impacted for carbon sink potential - |      |      |      |      |      |      | 29.1    |
| Land impacted for carbon sink potential - Low - Avoid deforestation (over 30 years) (1000 hectares)  | Low - Accelerate regeneration (1000       |      |      |      |      |      |      |         |
| Low - Avoid deforestation (over 30 years) (1000 hectares)  | hectares)                                 |      |      |      |      |      |      |         |
| Low - Avoid deforestation (over 30 years) (1000 hectares)  | Land impacted for carbon sink potential - |      |      |      |      |      |      | 170     |
| (1000 hectares)  |   |      |      |      |      |      |      |         |
|  |   |      |      |      |      |      |      |         |
| Lanu impacteu ion campon Sink potential -  | Land impacted for carbon sink potential - |      |      |      |      |      |      | 1,803   |
| Low - Extend rotation length (1000   |   |      |      |      |      |      |      | ,       |
| hectares)  |   |      |      |      |      |      |      |         |
|  |   |      | +    | +    |      |      |      | 561     |
| Low - Improve plantations (1000  |   |      |      |      |      |      |      |         |
| hectares)  |   |      |      |      |      |      |      |         |

Table 57: E-B+ scenario - PILLAR 6: Land sinks - Forests (continued)

| Item                                       | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050   |
|--|------|------|------|------|------|------|--------|
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 0      |
| Low - Increase retention of HWP (1000      |      |      |      |      |      |      |        |
| hectares)                                  |      |      |      |      |      |      |        |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 56     |
| Low - Increase trees outside forests       |      |      |      |      |      |      |        |
| (1000 hectares)                            |      |      |      |      |      |      |        |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 35.6   |
| Low - Reforest cropland (1000 hectares)    |      |      |      |      |      |      |        |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 56.8   |
| Low - Reforest pasture (1000 hectares)     |      |      |      |      |      |      |        |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 931    |
| Low - Restore productivity (1000           |      |      |      |      |      |      |        |
| hectares)                                  |      |      |      |      |      |      |        |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 3,642  |
| Low - Total impacted (over 30 years)       |      |      |      |      |      |      | •      |
| (1000 hectares)                            |      |      |      |      |      |      |        |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 43.7   |
| Mid - Accelerate regeneration (1000        |      |      |      |      |      |      |        |
| hectares)                                  |      |      |      |      |      |      |        |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 175    |
| Mid - Avoid deforestation (over 30 years)  |      |      |      |      |      |      |        |
| (1000 hectares)                            |      |      |      |      |      |      |        |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 3,254  |
| Mid - Extend rotation length (1000         |      |      |      |      |      |      | 0,20 . |
| hectares)                                  |      |      |      |      |      |      |        |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 844    |
| Mid - Improve plantations (1000 hectares)  |      |      |      |      |      |      | 0      |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 0      |
| Mid - Increase retention of HWP (1000      |      |      |      |      |      |      | Ū      |
| hectares)                                  |      |      |      |      |      |      |        |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 81.2   |
| Mid - Increase trees outside forests (1000 |      |      |      |      |      |      | 01.2   |
| hectares)                                  |      |      |      |      |      |      |        |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 53.4   |
| Mid - Reforest cropland (1000 hectares)    |      |      |      |      |      |      | 55.4   |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 410    |
| Mid - Reforest pasture (1000 hectares)     |      |      |      |      |      |      | 410    |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 1,876  |
| Mid - Restore productivity (1000           |      |      |      |      |      |      | 1,010  |
| hectares)                                  |      |      |      |      |      |      |        |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 6,737  |
|  |      |      |      |      |      |      | 0,131  |
| Mid - Total impacted (over 30 years) (1000 |      |      |      |      |      |      |        |
| hectares)                                  |      |      |      |      |      |      |        |

Table 58: E-B+ scenario - IMPACTS - Health

| Item   | 2020 | 2025 | 2030  | 2035  | 2040  | 2045  | 2050  |
|--|------|------|-------|-------|-------|-------|-------|
| Monetary damages from air pollution -<br>Coal (million 2019\$)           |      | 319  | 0.217 | 0.206 | 0.16  | 0.104 | 0.004 |
| Monetary damages from air pollution -<br>Natural Gas (million 2019\$)    |      | 110  | 52.6  | 30.1  | 21.1  | 8.66  | 4.65  |
| Monetary damages from air pollution -<br>Transportation (million 2019\$) |      | 410  | 410   | 397   | 357   | 283   | 194   |
| Premature deaths from air pollution -<br>Coal (deaths)                   |      | 36   | 0.024 | 0.023 | 0.018 | 0.012 | 0     |
| Premature deaths from air pollution -<br>Natural Gas (deaths)            |      | 12.4 | 5.93  | 3.4   | 2.39  | 0.977 | 0.525 |
| Premature deaths from air pollution -<br>Transportation (deaths)         |      | 46.1 | 46.1  | 44.7  | 40.1  | 31.8  | 21.8  |

Table 59: REF scenario - PILLAR 1: Efficiency/Electrification - Commercial

| Item  | 2020 | 2025   | 2030   | 2035 | 2040 | 2045  | 2050  |
|---|------|--------|--------|------|------|-------|-------|
| Commercial HVAC investment in 2020s -<br>Cumulative 5-yr (million \$2018) | 0    | 10,305 | 10,816 | 0    | 0    | 0     | 0     |
| Sales of cooking units - Electric<br>Resistance (%)                       | 30.1 | 32.3   | 32.3   | 32.3 | 32.3 | 32.3  | 32.3  |
| Sales of cooking units - Gas (%)  | 69.9 | 67.7   | 67.7   | 67.7 | 67.7 | 67.7  | 67.7  |
| Sales of space heating units - Electric<br>Heat Pump (%)                  | 2.92 | 28.4   | 67     | 78.3 | 79.4 | 79.5  | 79.5  |
| Sales of space heating units - Electric<br>Resistance (%)                 | 2.74 | 6.12   | 11.6   | 15.8 | 18.7 | 19.1  | 19.2  |
| Sales of space heating units - Fossil (%)                                 | 0    | 0      | 0      | 0    | 0    | 0     | 0     |
| Sales of space heating units - Gas Furnace (%)                            | 94.3 | 65.5   | 21.4   | 5.92 | 1.92 | 1.38  | 1.33  |
| Sales of water heating units - Electric<br>Heat Pump (%)                  | 0.08 | 0.13   | 0.128  | 0.13 | 0.13 | 0.128 | 0.128 |
| Sales of water heating units - Electric<br>Resistance (%)                 | 2.31 | 3.68   | 3.66   | 3.67 | 3.69 | 3.68  | 3.7   |
| Sales of water heating units - Gas Furnace (%)                            | 96.5 | 94.4   | 94.4   | 94.4 | 94.4 | 94.4  | 94.4  |
| Sales of water heating units - Other (%)                                  | 1.07 | 1.78   | 1.78   | 1.78 | 1.79 | 1.79  | 1.8   |

Table 60: REF scenario - PILLAR 1: Efficiency/Electrification - Electricity demand

| Item  | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|------|------|------|------|------|------|------|
| Electricity distribution capital invested - |      | 2.28 | 2.33 | 3.46 | 3.64 | 3.57 | 3.72 |
| Cumulative 5-yr (billion \$2018)            |      |      |      |      |      |      |      |

Table 61: REF scenario - PILLAR 1: Efficiency/Electrification - Overview

| Item                                   | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |  |
|--|------|------|------|------|------|------|------|--|
| Final energy use - Commercial (PJ)     | 90   | 91.9 | 92.9 | 93.6 | 95.4 | 100  | 108  |  |
| Final energy use - Industry (PJ)       | 236  | 248  | 257  | 261  | 270  | 278  | 287  |  |
| Final energy use - Residential (PJ)    | 123  | 117  | 115  | 115  | 116  | 119  | 121  |  |
| Final energy use - Transportation (PJ) | 324  | 305  | 279  | 263  | 263  | 271  | 282  |  |

Table 62: REF scenario - PILLAR 1: Efficiency/Electrification - Residential

| Item                                       | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|------|------|------|------|------|------|------|
| Residential HVAC investment in 2020s vs.   | 0    | 2.25 | 2.32 | 0    | 0    | 0    | 0    |
| REF - Cumulative 5-yr (billion \$2018)     |      |      |      |      |      |      |      |
| Sales of cooking units - Electric          | 52.1 | 52.1 | 52.1 | 52.1 | 52.1 | 52.1 | 52.1 |
| Resistance (%)                             |      |      |      |      |      |      |      |
| Sales of cooking units - Gas (%)           | 47.9 | 47.9 | 47.9 | 47.9 | 47.9 | 47.9 | 47.9 |
| Sales of space heating units - Electric    | 8.95 | 36.6 | 37.8 | 39.7 | 41.3 | 43.3 | 46.3 |
| Heat Pump (%)                              |      |      |      |      |      |      |      |
| Sales of space heating units - Electric    | 36.2 | 30.2 | 29.6 | 28.9 | 27.9 | 26.1 | 23   |
| Resistance (%)                             |      |      |      |      |      |      |      |
| Sales of space heating units - Fossil (%)  | 8.35 | 8.61 | 8.72 | 8.67 | 8.53 | 8.52 | 8.55 |
| Sales of space heating units - Gas (%)     | 46.5 | 24.5 | 23.8 | 22.8 | 22.3 | 22.1 | 22.2 |
| Sales of water heating units - Electric    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Heat Pump (%)                              |      |      |      |      |      |      |      |
| Sales of water heating units - Electric    | 44.5 | 56.5 | 56.6 | 56.6 | 56.5 | 56.5 | 56.5 |
| Resistance (%)                             |      |      |      |      |      |      |      |
| Sales of water heating units - Gas Furnace | 53.7 | 42   | 41.9 | 41.8 | 42   | 42   | 42   |
| (%)  |      |      |      |      |      |      |      |
| Sales of water heating units - Other (%)   | 1.86 | 1.52 | 1.52 | 1.52 | 1.53 | 1.53 | 1.53 |

Table 63: REF scenario - PILLAR 1: Efficiency/Electrification - Transportation

| Item                                       | 2020  | 2025  | 2030  | 2035  | 2040  | 2045  | 2050  |
|--|-------|-------|-------|-------|-------|-------|-------|
| Vehicle sales - Heavy-duty - diesel (%)    | 98.1  | 98.2  | 97.9  | 97    | 95.6  | 93.5  | 91.6  |
| Vehicle sales - Heavy-duty - EV (%)        | 0     | 0     | 0     | 0     | 0     | 0     | 0     |
| Vehicle sales - Heavy-duty - gasoline (%)  | 0.229 | 0.242 | 0.257 | 0.274 | 0.294 | 0.317 | 0.343 |
| Vehicle sales - Heavy-duty - hybrid (%)    | 0.083 | 0.096 | 0.112 | 0.13  | 0.15  | 0.174 | 0.202 |
| Vehicle sales - Heavy-duty - hydrogen FC   | 0.119 | 0.138 | 0.16  | 0.186 | 0.216 | 0.25  | 0.29  |
| (%)  |       |       |       |       |       |       |       |
| Vehicle sales - Heavy-duty - other (%)     | 1.51  | 1.31  | 1.57  | 2.37  | 3.69  | 5.71  | 7.57  |
| Vehicle sales - Light-duty - diesel (%)    | 1.82  | 2.19  | 2.23  | 2.07  | 1.88  | 1.75  | 1.67  |
| Vehicle sales - Light-duty - EV (%)        | 2.7   | 4.49  | 5.15  | 6.27  | 7.7   | 9.08  | 10.2  |
| Vehicle sales - Light-duty - gasoline (%)  | 91.7  | 88.3  | 86.6  | 85.1  | 83.3  | 81.3  | 79.6  |
| Vehicle sales - Light-duty - hybrid (%)    | 3.59  | 4.48  | 5.51  | 6.09  | 6.72  | 7.41  | 8.05  |
| Vehicle sales - Light-duty - hydrogen FC   | 0.112 | 0.386 | 0.361 | 0.325 | 0.325 | 0.327 | 0.339 |
| (%)  |       |       |       |       |       |       |       |
| Vehicle sales - Light-duty - other (%)     | 0.114 | 0.118 | 0.115 | 0.116 | 0.116 | 0.115 | 0.118 |
| Vehicle sales - Medium-duty - diesel (%)   | 65.2  | 63.5  | 61.6  | 59.6  | 58    | 56.5  | 55.2  |
| Vehicle sales - Medium-duty - EV (%)       | 0.027 | 0.105 | 0.329 | 0.671 | 0.895 | 0.973 | 0.993 |
| Vehicle sales - Medium-duty - gasoline (%) | 34    | 35.5  | 37    | 38.5  | 39.7  | 40.8  | 41.7  |
| Vehicle sales - Medium-duty - hybrid (%)   | 0.365 | 0.427 | 0.496 | 0.577 | 0.674 | 0.793 | 0.929 |
| Vehicle sales - Medium-duty - hydrogen     | 0.175 | 0.208 | 0.242 | 0.285 | 0.339 | 0.409 | 0.487 |
| FC (%)                                     |       |       |       |       |       |       |       |
| Vehicle sales - Medium-duty - other (%)    | 0.255 | 0.271 | 0.298 | 0.345 | 0.42  | 0.528 | 0.671 |

Table 64: REF scenario - PILLAR 6: Land sinks - Forests

| Item                                      | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050    |
|---|------|------|------|------|------|------|---------|
| Carbon sink potential - High - Accelerate |      |      |      |      |      |      | -356    |
| regeneration (1000 tCO2e/y)               |      |      |      |      |      |      |         |
| Carbon sink potential - High - All (not   |      |      |      |      |      |      | -46,154 |
| counting overlap) (1000 tCO2e/y)          |      |      |      |      |      |      |         |
| Carbon sink potential - High - Avoid      |      |      |      |      |      |      | -1,334  |
| deforestation (1000 tCO2e/y)              |      |      |      |      |      |      |         |
| Carbon sink potential - High - Extend     |      |      |      |      |      |      | -9,227  |
| rotation length (1000 tCO2e/y)            |      |      |      |      |      |      |         |
| Carbon sink potential - High - Improve    |      |      |      |      |      |      | -3,044  |
| plantations (1000 tCO2e/y)                |      |      |      |      |      |      |         |
| Carbon sink potential - High - Increase   |      |      |      |      |      |      | -13,825 |
| retention of HWP (1000 tCO2e/y)           |      |      |      |      |      |      |         |
| Carbon sink potential - High - Increase   |      |      |      |      |      |      | -1,120  |
| trees outside forests (1000 tCO2e/y)      |      |      |      |      |      |      |         |
| Carbon sink potential - High - Reforest   |      |      |      |      |      |      | -1,077  |
| cropland (1000 tCO2e/y)                   |      |      |      |      |      |      |         |
| Carbon sink potential - High - Reforest   |      |      |      |      |      |      | -11,526 |
| pasture (1000 tCO2e/y)                    |      |      |      |      |      |      |         |
| Carbon sink potential - High - Restore    |      |      |      |      |      |      | -4,644  |
| productivity (1000 tCO2e/y)               |      |      |      |      |      |      |         |
| Carbon sink potential - Low - Accelerate  |      |      |      |      |      |      | -178    |
| regeneration (1000 tCO2e/y)               |      |      |      |      |      |      |         |
| Carbon sink potential - Low - All (not    |      |      |      |      |      |      | -13,471 |
| counting overlap) (1000 tCO2e/y)          |      |      |      |      |      |      |         |
| Carbon sink potential - Low - Avoid       |      |      |      |      |      |      | -222    |
| deforestation (1000 tCO2e/y)              |      |      |      |      |      |      |         |
| Carbon sink potential - Low - Extend      |      |      |      |      |      |      | -3,544  |
| rotation length (1000 tCO2e/y)            |      |      |      |      |      |      |         |
| Carbon sink potential - Low - Improve     |      |      |      |      |      |      | -1,549  |
| plantations (1000 tCO2e/y)                |      |      |      |      |      |      |         |
| Carbon sink potential - Low - Increase    |      |      |      |      |      |      | -4,608  |
| retention of HWP (1000 tCO2e/y)           |      |      |      |      |      |      |         |
| Carbon sink potential - Low - Increase    |      |      |      |      |      |      | -392    |
| trees outside forests (1000 tCO2e/y)      |      |      |      |      |      |      |         |
| Carbon sink potential - Low - Reforest    |      |      |      |      |      |      | -538    |
| cropland (1000 tCO2e/y)                   |      |      |      |      |      |      |         |

Table 64: REF scenario - PILLAR 6: Land sinks - Forests (continued)

| Corbon sink notantial Low Referent         | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 205    |
|--|------|------|------|------|------|------|--------|
| Carbon sink potential - Low - Reforest     |      |      |      |      |      |      | -87    |
| pasture (1000 tC02e/y)                     |      |      |      |      |      |      | 4 = 1  |
| Carbon sink potential - Low - Restore      |      |      |      |      |      |      | -1,56  |
| productivity (1000 tC02e/y)                |      |      |      |      |      |      |        |
| Carbon sink potential - Mid - Accelerate   |      |      |      |      |      |      | -26    |
| regeneration (1000 tC02e/y)                |      |      |      |      |      |      | 0070   |
| Carbon sink potential - Mid - All (not     |      |      |      |      |      |      | -29,78 |
| counting overlap) (1000 tCO2e/y)           |      |      |      |      |      |      |        |
| Carbon sink potential - Mid - Avoid        |      |      |      |      |      |      | -77    |
| deforestation (1000 tC02e/y)               |      |      |      |      |      |      |        |
| Carbon sink potential - Mid - Extend       |      |      |      |      |      |      | -6,38  |
| rotation length (1000 tCO2e/y)             |      |      |      |      |      |      |        |
| Carbon sink potential - Mid - Improve      |      |      |      |      |      |      | -2,27  |
| plantations (1000 tCO2e/y)                 |      |      |      |      |      |      |        |
| Carbon sink potential - Mid - Increase     |      |      |      |      |      |      | -9,2   |
| retention of HWP (1000 tCO2e/y)            |      |      |      |      |      |      |        |
| Carbon sink potential - Mid - Increase     |      |      |      |      |      |      | -75    |
| trees outside forests (1000 tC02e/y)       |      |      |      |      |      |      |        |
| Carbon sink potential - Mid - Reforest     |      |      |      |      |      |      | -80    |
| cropland (1000 tCO2e/y)                    |      |      |      |      |      |      | 30     |
| Carbon sink potential - Mid - Reforest     |      |      |      |      |      |      | -6,20  |
| pasture (1000 tC02e/y)                     |      |      |      |      |      |      | 0,20   |
| Carbon sink potential - Mid - Restore      | +    |      |      |      |      | +    | -3,10  |
| productivity (1000 tCO2e/y)                |      |      |      |      |      |      | -3,10  |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 58     |
|  |      |      |      |      |      |      | 30     |
| High - Accelerate regeneration (1000       |      |      |      |      |      |      |        |
| hectares)                                  |      |      |      |      |      |      | 1,     |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 18     |
| High - Avoid deforestation (over 30 years) |      |      |      |      |      |      |        |
| (1000 hectares)                            |      |      |      |      |      |      |        |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 4,70   |
| High - Extend rotation length (1000        |      |      |      |      |      |      |        |
| hectares)                                  |      |      |      |      |      |      |        |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 1,12   |
| High - Improve plantations (1000           |      |      |      |      |      |      |        |
| hectares)                                  |      |      |      |      |      |      |        |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      |        |
| High - Increase retention of HWP (1000     |      |      |      |      |      |      |        |
| hectares)                                  |      |      |      |      |      |      |        |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 10     |
| High - Increase trees outside forests      |      |      |      |      |      |      | . •    |
| (1000 hectares)                            |      |      |      |      |      |      |        |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 71     |
| High - Reforest cropland (1000 hectares)   |      |      |      |      |      |      |        |
| Land impacted for carbon sink potential -  | +    | -    |      |      |      |      | 32     |
| High - Reforest pasture (1000 hectares)    |      |      |      |      |      |      | 32     |
| Land impacted for carbon sink potential -  | +    |      |      |      |      |      | 1,53   |
| ·  |      |      |      |      |      |      | 1,53   |
| High - Restore productivity (1000          |      |      |      |      |      |      |        |
| hectares)                                  |      |      |      |      |      |      | 0.44   |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 8,1    |
| High - Total impacted (over 30 years)      |      |      |      |      |      |      |        |
| (1000 hectares)                            |      |      |      |      |      |      |        |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 29     |
| Low - Accelerate regeneration (1000        |      |      |      |      |      |      |        |
| hectares)                                  |      |      |      |      |      |      |        |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 17     |
| Low - Avoid deforestation (over 30 years)  |      |      |      |      |      |      |        |
| (1000 hectares)                            |      |      |      |      |      |      |        |
| Land impacted for carbon sink potential -  |      |      |      |      |      |      | 1,80   |
| Low - Extend rotation length (1000         |      |      |      |      |      |      | .,50   |
| hectares)                                  |      | [    |      |      |      |      |        |

Table 64: REF scenario - PILLAR 6: Land sinks - Forests (continued)

| Item  | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050  |
|---|------|------|------|------|------|------|-------|
| Land impacted for carbon sink potential -   |      |      |      |      |      |      | 561   |
| 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 -   |      |      |      |      |      |      | 56    |
| Low - Increase trees outside forests  |      |      |      |      |      |      |       |
| (1000 hectares)   |      |      |      |      |      |      | 25.7  |
| Land impacted for carbon sink potential -   |      |      |      |      |      |      | 35.6  |
| Low - Reforest cropland (1000 hectares)   |      |      |      |      |      |      | F/ 0  |
| Land impacted for carbon sink potential -   |      |      |      |      |      |      | 56.8  |
| Low - Reforest pasture (1000 hectares)  Land impacted for carbon sink potential - |      |      |      |      |      |      | 931   |
| Low - Restore productivity (1000  |      |      |      |      |      |      | 931   |
| hectares)   |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -   |      |      |      |      |      |      | 3,642 |
| Low - Total impacted (over 30 years)  |      |      |      |      |      |      | 3,042 |
| (1000 hectares)   |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -   |      |      |      |      |      |      | 43.7  |
| Mid - Accelerate regeneration (1000   |      |      |      |      |      |      | 70.1  |
| hectares)   |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -   |      |      |      |      |      |      | 175   |
| Mid - Avoid deforestation (over 30 years)   |      |      |      |      |      |      |       |
| (1000 hectares)   |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -   |      |      |      |      |      |      | 3,254 |
| Mid - Extend rotation length (1000  |      |      |      |      |      |      |       |
| hectares)   |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -   |      |      |      |      |      |      | 844   |
| 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 -   |      |      |      |      |      |      | 81.2  |
| Mid - Increase trees outside forests (1000  |      |      |      |      |      |      |       |
| hectares)   |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -   |      |      |      |      |      |      | 53.4  |
| Mid - Reforest cropland (1000 hectares)   |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -   |      |      |      |      |      |      | 410   |
| Mid - Reforest pasture (1000 hectares)  |      |      |      |      |      |      |       |
| Land impacted for carbon sink potential -   |      |      |      |      |      |      | 1,876 |
| Mid - Restore productivity (1000  |      |      |      |      |      |      |       |
| hectares)   |      |      |      |      |      |      | / 707 |
| Land impacted for carbon sink potential -   |      |      |      |      |      |      | 6,737 |
| Mid - Total impacted (over 30 years) (1000  |      |      |      |      |      |      |       |
| hectares)   |      |      |      |      |      |      |       |

Table 65: 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)                | -22.2 |      | -14.6 |      |      |      | -11.9 |
| Business-as-usual carbon sink - Retained in Hardwood Products (Mt CO2e/y) | -3.76 |      | -6.27 |      |      |      | -6.6  |
| Business-as-usual carbon sink - Total (Mt<br>CO2e/y)                      | -26   |      | -20.9 |      |      |      | -18.5 |

Table 66: REF scenario - IMPACTS - Health

| Item   | 2020 | 2025  | 2030 | 2035 | 2040 | 2045 | 2050 |
|--|------|-------|------|------|------|------|------|
| Monetary damages from air pollution -<br>Coal (million 2019\$)           |      | 1,291 | 810  | 532  | 419  | 377  | 374  |
| Monetary damages from air pollution -<br>Natural Gas (million 2019\$)    |      | 122   | 119  | 126  | 95.4 | 75.3 | 67.7 |
| Monetary damages from air pollution -<br>Transportation (million 2019\$) |      | 410   | 416  | 424  | 433  | 443  | 453  |
| Premature deaths from air pollution -<br>Coal (deaths)                   |      | 146   | 91.5 | 60.1 | 47.3 | 42.6 | 42.2 |
| Premature deaths from air pollution -<br>Natural Gas (deaths)            |      | 13.8  | 13.5 | 14.2 | 10.8 | 8.5  | 7.64 |
| Premature deaths from air pollution -<br>Transportation (deaths)         |      | 46.2  | 46.8 | 47.7 | 48.7 | 49.8 | 51   |