Net-Zero America - new mexico state report

2021-03-05

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 https://netzeroamerica.princeton.edu.
- 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 state-level 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.

Data by category and subcategory

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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 - Cumulative 5-yr (million $2018)	0	5,003	5,574	0	0	0	0
Sales of cooking units - Electric Resistance (%)	41.9	54.6	83	88.6	88.9	88.9	88.9
Sales of cooking units - Gas (%)	58.1	45.4	17	11.4	11.1	11.1	11.1
Sales of space heating units - Electric Heat Pump (%)	1.58	19.8	62.6	88.7	92.5	92.6	92.7
Sales of space heating units - Electric Resistance (%)	1.76	3.39	4.14	6.37	6.83	6.86	6.85
Sales of space heating units - Fossil (%)	0	0.199	0.038	0.002	0	0	0
Sales of space heating units - Gas Furnace (%)	96.7	76.6	33.3	4.92	0.721	0.496	0.493
Sales of water heating units - Electric Heat Pump (%)	0.016	7.95	44.7	60.9	62.8	62.9	62.9
Sales of water heating units - Electric Resistance (%)	0.796	4.99	22.9	34.8	36.6	36.7	36.7
Sales of water heating units - Gas Furnace (%)	99	86.7	32.1	3.86	0.201	0	0
Sales of water heating units - Other (%)	0.192	0.382	0.382	0.383	0.381	0.382	0.382

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

Item	2020	2025	2030	2035	2040	2045	2050
Electricity distribution capital invested - Cumulative 5-yr (billion $2018)		1.12	1.17	2.25	2.43	2.16	2.28

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

Item	2020	2025	2030	2035	2040	2045	2050
Final energy use - Commercial (PJ)	61.7	61.5	59.1	55.3	51.5	49.4	48.9
Final energy use - Industry (PJ)	35.8	36.3	35.9	36.6	38.7	39.4	40.1
Final energy use - Residential (PJ)	73.6	69.9	64.4	56.2	48.8	44.3	42
Final energy use - Transportation (PJ)	268	250	222	187	156	137	129

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

Item	2020	2025	2030	2035	2040	2045	2050
Residential HVAC investment in 2020s vs. REF - Cumulative 5-yr (billion $2018)	0	1.87	2.24	0	0	0	0
Sales of cooking units - Electric Resistance (%)	41.9	54.2	92.2	99.6	100	100	100
Sales of cooking units - Gas (%)	58.1	45.8	7.83	0.394	0	0	0
Sales of space heating units - Electric Heat Pump (%)	5.11	20.2	63.3	85.3	88.8	89.3	89
Sales of space heating units - Electric Resistance (%)	6.51	10.4	5.63	3.21	2.94	2.96	2.97
Sales of space heating units - Fossil (%)	10.2	14.7	10.2	7.32	6.18	5.78	6.11
Sales of space heating units - Gas (%)	78.2	54.7	20.9	4.15	2.05	1.95	1.94
Sales of water heating units - Electric Heat Pump (%)	0	7.63	42.7	57.5	59.2	59.2	59.2
Sales of water heating units - Electric Resistance (%)	11.7	24.2	31.3	38.3	39.4	39.5	39.5
Sales of water heating units - Gas Furnace (%)	87.3	67	24.8	2.98	0.155	0	0
Sales of water heating units - Other (%)	1.03	1.2	1.22	1.23	1.24	1.24	1.25

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

Item	2020	2025	2030	2035	2040	2045	2050
Light-duty vehicle capital costs - Cumulative 5-yr (million $2018)	0	350	897	1,453	2,201	2,395	2,284
Public EV charging plugs - DC Fast (1000 units)	0.099	0	0.64	0	2.8	0	4.53
Public EV charging plugs - L2 (1000 units)	0.151	0	15.4	0	67.5	0	109
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 (%)	1.71	1.95	1.32	0.424	0.077	0.013	0
Vehicle sales - Light-duty - EV (%)	3.39	13.6	44	80.8	96.2	99.3	100
Vehicle sales - Light-duty - gasoline (%)	90.8	79.8	51.4	17.5	3.42	0.594	0
Vehicle sales - Light-duty - hybrid (%)	3.91	4.17	3.04	1.15	0.276	0.059	0
Vehicle sales - Light-duty - hydrogen FC (%)	0.111	0.349	0.216	0.068	0.013	0.002	0
Vehicle sales - Light-duty - other (%)	0.109	0.105	0.07	0.025	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 FC (%)	0.196	1.27	6.33	15.2	19.1	19.9	20
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	0	0.01	0.021
Capital invested - Biomass w/ccu power plant (billion $2018)	0	0	0	0	0	0.014	0.004
Capital invested - Solar PV - Base (billion $2018)	0	7.83	9.25	11.1	5.38	3.26	1.97
Capital invested - Solar PV - Constrained (billion $2018)	0	0.876	0	0	1.04	1.02	1.11
Capital invested - Wind - Base (billion $2018)	0	14.4	19	20.7	13.5	8.91	13.5
Capital invested - Wind - Constrained (billion $2018)	0	14.6	12.8	18.5	13.6	5.1	14.3
Installed (cumulative) - OffshoreWind - Base land use assumptions (MW)	0	0	0	0	0	0	0
Installed (cumulative) - Rooftop PV (MW)	209	318	427	564	734	941	1,198
Installed (cumulative) - Solar - Base land use assumptions (MW)	853	6,698	14,428	24,525	29,704	33,028	35,151
Installed (cumulative) - Wind - Base land use assumptions (MW)	7,131	16,928	31,213	47,864	59,287	67,230	79,939

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	0	0	9.98	30.8
Biomass w/ccu power plant (GWh)	0	0	0	0	0	16	20.1
Solar - Base land use assumptions (GWh)	2,269	14,000	18,491	24,169	12,382	7,953	5,065
Solar - Constrained land use assumptions (GWh)	1,588	463	0	1,545	4,041	1,086	1,321

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

Item	2020	2025	2030	2035	2040	2045	2050
Wind - Base land use assumptions (GWh)	24,562	31,717	44,413	49,298	32,992	23,613	36,789
Wind - Constrained land use assumptions (GWh)	24,176	25,574	24,629	36,843	21,893	7,728	28,372

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	0	14.2	85.6	195
Conversion capital investment - Cumulative 5-yr (million $2018)	0	0	0	0	203	1,035	1,602
Number of facilities - Allam power w ccu (quantity)	0	0	0	0	0	1	1
Number of facilities - Beccs hydrogen (quantity)	0	0	0	0	1	3	6
Number of facilities - Diesel (quantity)	0	0	0	0	0	0	0
Number of facilities - Diesel ccu (quantity)	0	0	0	0	0	1	1
Number of facilities - Power (quantity)	0	0	0	0	0	0	0
Number of facilities - Power ccu (quantity)	0	0	0	0	0	1	1
Number of facilities - Pyrolysis (quantity)	0	0	0	0	0	0	0
Number of facilities - Pyrolysis ccu (quantity)	0	0	0	0	0	1	1
Number of facilities - Sng (quantity)	0	0	0	0	0	0	0
Number of facilities - Sng ccu (quantity)	0	0	0	0	0	1	1

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

Item	2020	2025	2030	2035	2040	2045	2050
Annual - All (MMT)		0	0	0	0.26	1.57	3.58
Annual - BECCS (MMT)		0	0	0	0.26	1.57	3.58
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	0	0.26	1.83	5.41
Cumulative - BECCS (MMT)		0	0	0	0.26	1.83	5.41
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	0	0	35.9	681	1,245
Cumulative investment - All (million $2018)		0	0	0	20.2	379	709
Cumulative investment - Spur (million $2018)		0	0	0	20.2	379	709
Cumulative investment - Trunk (million $2018)		0	0	0	0	0	0
Spur (km)		0	0	0	35.9	681	1,245
Trunk (km)		0	0	0	0	0	0

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

Item	2020	2025	2030	2035	2040	2045	2050
CO2 storage (MMT)		0	0	3.52	5.42	10.3	13.1
Injection wells (wells)		0	0	4	6	12	14
Resource characterization, appraisal, permitting costs (million $2020)		5.15	92.7	147	147	147	147
Wells and facilities construction costs (million $2020)		0	28.4	111	197	330	410

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Aggressive deployment - Corn-ethanol to energy grasses (1000 tCO2e/y)							0
Carbon sink potential - Aggressive deployment - Cropland measures (1000 tCO2e/y)							-506
Carbon sink potential - Aggressive deployment - Permanent conservation cover (1000 tCO2e/y)							-31.7
Carbon sink potential - Aggressive deployment - Total (1000 tCO2e/y)							-538
Carbon sink potential - Moderate deployment - Corn-ethanol to energy grasses (1000 tCO2e/y)							0
Carbon sink potential - Moderate deployment - Cropland measures (1000 tCO2e/y)							-261
Carbon sink potential - Moderate deployment - Permanent conservation cover (1000 tCO2e/y)							-15.8
Carbon sink potential - Moderate deployment - Total (1000 tCO2e/y)							-277
Land impacted for carbon sink - Aggressive deployment - Corn-ethanol to energy grasses (1000 hectares)							0
Land impacted for carbon sink - Aggressive deployment - Cropland measures (1000 hectares)							691
Land impacted for carbon sink - Aggressive deployment - Permanent conservation cover (1000 hectares)							48.6
Land impacted for carbon sink - Aggressive deployment - Total (1000 hectares)							739
Land impacted for carbon sink - Moderate deployment - Corn-ethanol to energy grasses (1000 hectares)							0
Land impacted for carbon sink - Moderate deployment - Cropland measures (1000 hectares)							358
Land impacted for carbon sink - Moderate deployment - Permanent conservation cover (1000 hectares)							24.3
Land impacted for carbon sink - Moderate deployment - Total (1000 hectares)							382

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - High - Accelerate regeneration (1000 tCO2e/y)							-3,236
Carbon sink potential - High - All (not counting overlap) (1000 tCO2e/y)							-27,508
Carbon sink potential - High - Avoid deforestation (1000 tCO2e/y)							-1,156
Carbon sink potential - High - Extend rotation length (1000 tCO2e/y)							-9,681
Carbon sink potential - High - Improve plantations (1000 tCO2e/y)							-11.6
Carbon sink potential - High - Increase retention of HWP (1000 tCO2e/y)							-103

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - High - Increase trees outside forests (1000 tCO2e/y)							-365
Carbon sink potential - High - Reforest cropland (1000 tCO2e/y)							-5,360
Carbon sink potential - High - Reforest pasture (1000 tCO2e/y)							-1,215
Carbon sink potential - High - Restore productivity (1000 tCO2e/y)							-6,378
Carbon sink potential - Low - Accelerate regeneration (1000 tCO2e/y)							-1,622
Carbon sink potential - Low - All (not counting overlap) (1000 tCO2e/y)							-10,623
Carbon sink potential - Low - Avoid deforestation (1000 tCO2e/y)							-193
Carbon sink potential - Low - Extend rotation length (1000 tCO2e/y)							-3,718
Carbon sink potential - Low - Improve plantations (1000 tCO2e/y)							-5.92
Carbon sink potential - Low - Increase retention of HWP (1000 tCO2e/y)							-34.4
Carbon sink potential - Low - Increase trees outside forests (1000 tCO2e/y)							-128
Carbon sink potential - Low - Reforest cropland (1000 tCO2e/y)							-2,680
Carbon sink potential - Low - Reforest pasture (1000 tCO2e/y)							-92.1
Carbon sink potential - Low - Restore productivity (1000 tCO2e/y)							-2,150
Carbon sink potential - Mid - Accelerate regeneration (1000 tCO2e/y)							-2,429
Carbon sink potential - Mid - All (not counting overlap) (1000 tCO2e/y)							-19,065
Carbon sink potential - Mid - Avoid deforestation (1000 tCO2e/y)							-674
Carbon sink potential - Mid - Extend rotation length (1000 tCO2e/y)							-6,700
Carbon sink potential - Mid - Improve plantations (1000 tCO2e/y)							-8.68
Carbon sink potential - Mid - Increase retention of HWP (1000 tCO2e/y)							-68.9
Carbon sink potential - Mid - Increase trees outside forests (1000 tCO2e/y)							-247
Carbon sink potential - Mid - Reforest cropland (1000 tCO2e/y)							-4,020
Carbon sink potential - Mid - Reforest pasture (1000 tCO2e/y)							-654
Carbon sink potential - Mid - Restore productivity (1000 tCO2e/y)							-4,264
Land impacted for carbon sink potential - High - Accelerate regeneration (1000 hectares)							529
Land impacted for carbon sink potential - High - Avoid deforestation (over 30 years) (1000 hectares)							157
Land impacted for carbon sink potential - High - Extend rotation length (1000 hectares)							4,937
Land impacted for carbon sink potential - High - Improve plantations (1000 hectares)							4.29

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

Item	2020	2025	2030	2035	2040	2045	2050
Land impacted for carbon sink potential - High - Increase retention of HWP (1000 hectares)							0
Land impacted for carbon sink potential - High - Increase trees outside forests (1000 hectares)							34.7
Land impacted for carbon sink potential - High - Reforest cropland (1000 hectares)							354
Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares)							34.5
Land impacted for carbon sink potential - High - Restore productivity (1000 hectares)							2,114
Land impacted for carbon sink potential - High - Total impacted (over 30 years) (1000 hectares)							8,165
Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)							265
Land impacted for carbon sink potential - Low - Avoid deforestation (over 30 years) (1000 hectares)							147
Land impacted for carbon sink potential - Low - Extend rotation length (1000 hectares)							1,891
Land impacted for carbon sink potential - Low - Improve plantations (1000 hectares)							2.15
Land impacted for carbon sink potential - Low - Increase retention of HWP (1000 hectares)							0
Land impacted for carbon sink potential - Low - Increase trees outside forests (1000 hectares)							18.3
Land impacted for carbon sink potential - Low - Reforest cropland (1000 hectares)							177
Land impacted for carbon sink potential - Low - Reforest pasture (1000 hectares)							5.99
Land impacted for carbon sink potential - Low - Restore productivity (1000 hectares)							1,279
Land impacted for carbon sink potential - Low - Total impacted (over 30 years) (1000 hectares)							3,786
Land impacted for carbon sink potential - Mid - Accelerate regeneration (1000 hectares)							397
Land impacted for carbon sink potential - Mid - Avoid deforestation (over 30 years) (1000 hectares)							152
Land impacted for carbon sink potential - Mid - Extend rotation length (1000 hectares)							3,414
Land impacted for carbon sink potential - Mid - Improve plantations (1000 hectares)							3.23
Land impacted for carbon sink potential - Mid - Increase retention of HWP (1000 hectares)							0
Land impacted for carbon sink potential - Mid - Increase trees outside forests (1000 hectares)							26.5

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

Item	2020	2025	2030	2035	2040	2045	2050
Land impacted for carbon sink potential - Mid - Reforest cropland (1000 hectares)							266
Land impacted for carbon sink potential - Mid - Reforest pasture (1000 hectares)							43.3
Land impacted for carbon sink potential - Mid - Restore productivity (1000 hectares)							2,576
Land impacted for carbon sink potential - Mid - Total impacted (over 30 years) (1000 hectares)							6,878

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

Item	2020	2025	2030	2035	2040	2045	2050
Natural gas consumption - Annual (tcf)		210	177	142	107	67.3	46.7
Natural gas consumption - Cumulative (tcf)		0	0	0	0	0	4,279
Natural gas production - Annual (tcf)		1,660	1,569	1,367	1,156	917	712
Oil consumption - Annual (million bbls)		45.5	39.3	30	21.1	14.1	8.13
Oil consumption - Cumulative (million bbls)		0	0	0	0	0	919
Oil production - Annual (million bbls)		323	324	323	256	208	139

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

Item	2020	2025	2030	2035	2040	2045	2050
Monetary damages from air pollution - Coal (million 2019$)		98.6	0.084	0.083	0.061	0.038	0
Monetary damages from air pollution - Natural Gas (million 2019$)		28.2	18.7	13.7	12.7	7.88	3.46
Monetary damages from air pollution - Transportation (million 2019$)		215	204	159	93.1	43	16.9
Premature deaths from air pollution - Coal (deaths)		11.1	0.009	0.009	0.007	0.004	0
Premature deaths from air pollution - Natural Gas (deaths)		3.19	2.12	1.55	1.43	0.89	0.391
Premature deaths from air pollution - Transportation (deaths)		24.2	23	17.8	10.5	4.84	1.9

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

Item	2020	2025	2030	2035	2040	2045	2050
By economic sector - Agriculture (jobs)		1.68	3.41	1.3	20.1	94.9	178
By economic sector - Construction (jobs)		21,265	27,580	34,988	33,874	32,502	33,505
By economic sector - Manufacturing (jobs)		10,184	12,452	14,361	12,846	11,240	11,099
By economic sector - Mining (jobs)		12,759	10,124	7,932	5,181	3,363	1,824
By economic sector - Other (jobs)		2,099	3,112	4,344	4,297	4,329	4,834
By economic sector - Pipeline (jobs)		1,194	1,122	1,031	808	649	521
By economic sector - Professional (jobs)		11,806	15,764	20,749	21,352	21,511	23,142
By economic sector - Trade (jobs)		10,057	11,661	14,036	13,627	13,359	14,029
By economic sector - Utilities (jobs)		13,265	17,083	23,185	24,978	25,343	27,310
By education level - All sectors - Associates degree or some college (jobs)		25,056	30,537	37,788	37,021	35,777	37,351
By education level - All sectors - Bachelors degree (jobs)		18,410	21,446	25,657	24,722	23,672	24,391
By education level - All sectors - Doctoral degree (jobs)		679	822	1,009	991	967	1,011
By education level - All sectors - High school diploma or less (jobs)		33,988	40,785	49,725	47,948	45,869	47,332

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

Item	2020	2025	2030	2035	2040	2045	2050
By education level - All sectors - Masters or professional degree (jobs)		4,497	5,311	6,448	6,301	6,105	6,357
By resource sector - Biomass (jobs)		7.22	9.41	3.72	60.4	346	761
By resource sector - CO2 (jobs)		2.01	52.4	65.5	75.4	394	1,115
By resource sector - Coal (jobs)		742	121	10.2	7.55	5.87	4.93
By resource sector - Grid (jobs)		20,811	28,724	41,454	45,355	46,918	50,936
By resource sector - Natural Gas (jobs)		11,032	9,084	6,953	5,555	3,588	2,149
By resource sector - Nuclear (jobs)		0	0	0	0	0	0
By resource sector - Oil (jobs)		24,959	22,653	20,474	14,926	11,195	6,939
By resource sector - Solar (jobs)		11,105	15,166	20,050	16,842	15,307	16,591
By resource sector - Wind (jobs)		13,972	23,091	31,616	34,162	34,636	37,946
Median wages - Annual - All ($2019 per job)		58,972	59,066	59,477	60,349	61,243	62,042
On-Site or In-Plant Training - Total jobs - 1 to 4 years (jobs)		13,295	16,045	19,702	19,196	18,478	19,179
On-Site or In-Plant Training - Total jobs - 4 to 10 years (jobs)		5,570	6,808	8,453	8,310	8,051	8,381
On-Site or In-Plant Training - Total jobs - None (jobs)		13,402	16,097	19,642	19,035	18,292	18,998
On-Site or In-Plant Training - Total jobs - Over 10 years (jobs)		664	825	1,037	1,028	1,001	1,049
On-Site or In-Plant Training - Total jobs - Up to 1 year (jobs)		49,699	59,127	71,792	69,414	66,569	68,834
On-the-Job Training - All sectors - 1 to 4 years (jobs)		17,067	20,655	25,428	24,838	23,946	24,898
On-the-Job Training - All sectors - 4 to 10 years (jobs)		5,321	6,592	8,270	8,178	7,955	8,322
On-the-Job Training - All sectors - None (jobs)		4,647	5,501	6,644	6,382	6,106	6,310
On-the-Job Training - All sectors - Over 10 years (jobs)		803	965	1,162	1,105	1,043	1,069
On-the-Job Training - All sectors - Up to 1 year (jobs)		54,792	65,188	79,121	76,481	73,340	75,844
Related work experience - All sectors - 1 to 4 years (jobs)		30,250	35,995	43,757	42,409	40,730	42,129
Related work experience - All sectors - 4 to 10 years (jobs)		19,445	23,287	28,431	27,660	26,611	27,594
Related work experience - All sectors - None (jobs)		11,670	14,033	17,192	16,719	16,098	16,713
Related work experience - All sectors - Over 10 years (jobs)		5,209	6,175	7,469	7,218	6,906	7,133
Related work experience - All sectors - Up to 1 year (jobs)		16,055	19,412	23,778	22,977	22,045	22,872
Wage income - All (million $2019)		4,873	5,842	7,175	7,061	6,884	7,225

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

Item	2020	2025	2030	2035	2040	2045	2050
Commercial HVAC investment in 2020s - Cumulative 5-yr (million $2018)	0	5,000	5,547	0	0	0	0
Sales of cooking units - Electric Resistance (%)	41.9	46.2	50.2	60.8	75.4	84.6	87.8
Sales of cooking units - Gas (%)	58.1	53.8	49.8	39.2	24.6	15.4	12.2
Sales of space heating units - Electric Heat Pump (%)	1.58	12.8	17.7	32.2	57.3	78.6	88.4
Sales of space heating units - Electric Resistance (%)	1.76	3.37	3.45	3.77	4.61	5.79	6.51
Sales of space heating units - Fossil (%)	0	0.23	0.214	0.159	0.078	0.025	0.007
Sales of space heating units - Gas Furnace (%)	96.7	83.6	78.7	63.9	38	15.6	5.05

Table 17: *E- scenario - PILLAR 1: Efficiency/Electrification - Commercial (continued)*

Item	2020	2025	2030	2035	2040	2045	2050
Sales of water heating units - Electric Heat Pump (%)	0.016	1.51	5.7	18	38.2	53.7	60.3
Sales of water heating units - Electric Resistance (%)	0.796	2.19	4.23	10.3	21	30.4	34.7
Sales of water heating units - Gas Furnace (%)	99	95.9	89.7	71.3	40.4	15.6	4.61
Sales of water heating units - Other (%)	0.192	0.382	0.382	0.383	0.381	0.382	0.382

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

Item	2020	2025	2030	2035	2040	2045	2050
Electricity distribution capital invested - Cumulative 5-yr (billion $2018)		0.866	0.891	1.24	1.3	1.97	2.11

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

Item	2020	2025	2030	2035	2040	2045	2050
Final energy use - Commercial (PJ)	61.7	61.6	61.1	60.2	58.4	56.2	54.2
Final energy use - Industry (PJ)	35.8	36.3	36.1	37.2	39.6	40.4	41.1
Final energy use - Residential (PJ)	73.6	70.2	68	65.4	60.8	55.1	49.4
Final energy use - Transportation (PJ)	268	252	231	214	201	186	169

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

Item	2020	2025	2030	2035	2040	2045	2050
Residential HVAC investment in 2020s vs. REF - Cumulative 5-yr (billion $2018)	0	1.86	2.24	0	0	0	0
Sales of cooking units - Electric Resistance (%)	41.7	43.2	48.5	62.6	82.2	94.2	98.5
Sales of cooking units - Gas (%)	58.3	56.8	51.5	37.4	17.8	5.75	1.55
Sales of space heating units - Electric Heat Pump (%)	5.11	12.8	17.7	32.4	57.3	77.2	85.4
Sales of space heating units - Electric Resistance (%)	6.51	11.2	10.6	9.06	6.48	4.32	3.36
Sales of space heating units - Fossil (%)	10.2	15.5	15.4	13.1	9.22	6.81	6.5
Sales of space heating units - Gas (%)	78.2	60.4	56.3	45.5	27	11.7	4.76
Sales of water heating units - Electric Heat Pump (%)	0	1.41	5.41	17.1	36.2	50.8	56.8
Sales of water heating units - Electric Resistance (%)	11.7	23.2	24.2	26.7	31.4	36	38.4
Sales of water heating units - Gas Furnace (%)	87.3	74.1	69.2	55	31.1	12	3.54
Sales of water heating units - Other (%)	1.03	1.2	1.22	1.23	1.24	1.24	1.25

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

Item	2020	2025	2030	2035	2040	2045	2050
Light-duty vehicle capital costs - Cumulative 5-yr (million $2018)	0	0	56.7	119	402	1,263	1,841
Public EV charging plugs - DC Fast (1000 units)	0.099	0	0.199	0	1.04	0	2.9
Public EV charging plugs - L2 (1000 units)	0.151	0	4.8	0	25.1	0	69.9
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 (%)	1.72	2.1	2.09	1.67	1.08	0.558	0.238

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

Item	2020	2025	2030	2035	2040	2045	2050
Vehicle sales - Light-duty - EV (%)	1.7	4.28	11	24.5	46.9	71.1	87.2
Vehicle sales - Light-duty - gasoline (%)	92.3	88.2	80.9	68.4	47.9	25.9	11.4
Vehicle sales - Light-duty - hybrid (%)	4.04	4.88	5.53	5.11	3.91	2.35	1.15
Vehicle sales - Light-duty - hydrogen FC (%)	0.113	0.385	0.335	0.259	0.186	0.104	0.048
Vehicle sales - Light-duty - other (%)	0.11	0.113	0.104	0.091	0.066	0.037	0.017
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 FC (%)	0.166	0.485	1.37	3.58	7.86	13.2	17
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 deployment - Corn-ethanol to energy grasses (1000 tCO2e/y)							0
Carbon sink potential - Aggressive deployment - Cropland measures (1000 tCO2e/y)							-506
Carbon sink potential - Aggressive deployment - Permanent conservation cover (1000 tCO2e/y)							-31.7
Carbon sink potential - Aggressive deployment - Total (1000 tCO2e/y)							-538
Carbon sink potential - Moderate deployment - Corn-ethanol to energy grasses (1000 tCO2e/y)							0
Carbon sink potential - Moderate deployment - Cropland measures (1000 tCO2e/y)							-261
Carbon sink potential - Moderate deployment - Permanent conservation cover (1000 tCO2e/y)							-15.8
Carbon sink potential - Moderate deployment - Total (1000 tCO2e/y)							-277
Land impacted for carbon sink - Aggressive deployment - Corn-ethanol to energy grasses (1000 hectares)							0
Land impacted for carbon sink - Aggressive deployment - Cropland measures (1000 hectares)							691
Land impacted for carbon sink - Aggressive deployment - Permanent conservation cover (1000 hectares)							48.6
Land impacted for carbon sink - Aggressive deployment - Total (1000 hectares)							739
Land impacted for carbon sink - Moderate deployment - Corn-ethanol to energy grasses (1000 hectares)							0
Land impacted for carbon sink - Moderate deployment - Cropland measures (1000 hectares)							358
Land impacted for carbon sink - Moderate deployment - Permanent conservation cover (1000 hectares)							24.3

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

Item	2020	2025	2030	2035	2040	2045	2050
Land impacted for carbon sink - Moderate deployment - Total (1000 hectares)							382

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - High - Accelerate regeneration (1000 tCO2e/y)							-3,236
Carbon sink potential - High - All (not counting overlap) (1000 tCO2e/y)							-27,508
Carbon sink potential - High - Avoid deforestation (1000 tCO2e/y)							-1,156
Carbon sink potential - High - Extend rotation length (1000 tCO2e/y)							-9,681
Carbon sink potential - High - Improve plantations (1000 tCO2e/y)							-11.6
Carbon sink potential - High - Increase retention of HWP (1000 tCO2e/y)							-103
Carbon sink potential - High - Increase trees outside forests (1000 tCO2e/y)							-365
Carbon sink potential - High - Reforest cropland (1000 tCO2e/y)							-5,360
Carbon sink potential - High - Reforest pasture (1000 tCO2e/y)							-1,215
Carbon sink potential - High - Restore productivity (1000 tCO2e/y)							-6,378
Carbon sink potential - Low - Accelerate regeneration (1000 tCO2e/y)							-1,622
Carbon sink potential - Low - All (not counting overlap) (1000 tCO2e/y)							-10,623
Carbon sink potential - Low - Avoid deforestation (1000 tCO2e/y)							-193
Carbon sink potential - Low - Extend rotation length (1000 tCO2e/y)							-3,718
Carbon sink potential - Low - Improve plantations (1000 tCO2e/y)							-5.92
Carbon sink potential - Low - Increase retention of HWP (1000 tCO2e/y)							-34.4
Carbon sink potential - Low - Increase trees outside forests (1000 tCO2e/y)							-128
Carbon sink potential - Low - Reforest cropland (1000 tCO2e/y)							-2,680
Carbon sink potential - Low - Reforest pasture (1000 tCO2e/y)							-92.1
Carbon sink potential - Low - Restore productivity (1000 tCO2e/y)							-2,150
Carbon sink potential - Mid - Accelerate regeneration (1000 tCO2e/y)							-2,429
Carbon sink potential - Mid - All (not counting overlap) (1000 tCO2e/y)							-19,065
Carbon sink potential - Mid - Avoid deforestation (1000 tCO2e/y)							-674
Carbon sink potential - Mid - Extend rotation length (1000 tCO2e/y)							-6,700
Carbon sink potential - Mid - Improve plantations (1000 tCO2e/y)							-8.68
Carbon sink potential - Mid - Increase retention of HWP (1000 tCO2e/y)							-68.9
Carbon sink potential - Mid - Increase trees outside forests (1000 tCO2e/y)							-247

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Mid - Reforest cropland (1000 tCO2e/y)							-4,020
Carbon sink potential - Mid - Reforest pasture (1000 tCO2e/y)							-654
Carbon sink potential - Mid - Restore productivity (1000 tCO2e/y)							-4,264
Land impacted for carbon sink potential - High - Accelerate regeneration (1000 hectares)							529
Land impacted for carbon sink potential - High - Avoid deforestation (over 30 years) (1000 hectares)							157
Land impacted for carbon sink potential - High - Extend rotation length (1000 hectares)							4,937
Land impacted for carbon sink potential - High - Improve plantations (1000 hectares)							4.29
Land impacted for carbon sink potential - High - Increase retention of HWP (1000 hectares)							0
Land impacted for carbon sink potential - High - Increase trees outside forests (1000 hectares)							34.7
Land impacted for carbon sink potential - High - Reforest cropland (1000 hectares)							354
Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares)							34.5
Land impacted for carbon sink potential - High - Restore productivity (1000 hectares)							2,114
Land impacted for carbon sink potential - High - Total impacted (over 30 years) (1000 hectares)							8,165
Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)							265
Land impacted for carbon sink potential - Low - Avoid deforestation (over 30 years) (1000 hectares)							147
Land impacted for carbon sink potential - Low - Extend rotation length (1000 hectares)							1,891
Land impacted for carbon sink potential - Low - Improve plantations (1000 hectares)							2.15
Land impacted for carbon sink potential - Low - Increase retention of HWP (1000 hectares)							0
Land impacted for carbon sink potential - Low - Increase trees outside forests (1000 hectares)							18.3
Land impacted for carbon sink potential - Low - Reforest cropland (1000 hectares)							177
Land impacted for carbon sink potential - Low - Reforest pasture (1000 hectares)							5.99
Land impacted for carbon sink potential - Low - Restore productivity (1000 hectares)							1,279

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

Item	2020	2025	2030	2035	2040	2045	2050
Land impacted for carbon sink potential - Low - Total impacted (over 30 years) (1000 hectares)							3,786
Land impacted for carbon sink potential - Mid - Accelerate regeneration (1000 hectares)							397
Land impacted for carbon sink potential - Mid - Avoid deforestation (over 30 years) (1000 hectares)							152
Land impacted for carbon sink potential - Mid - Extend rotation length (1000 hectares)							3,414
Land impacted for carbon sink potential - Mid - Improve plantations (1000 hectares)							3.23
Land impacted for carbon sink potential - Mid - Increase retention of HWP (1000 hectares)							0
Land impacted for carbon sink potential - Mid - Increase trees outside forests (1000 hectares)							26.5
Land impacted for carbon sink potential - Mid - Reforest cropland (1000 hectares)							266
Land impacted for carbon sink potential - Mid - Reforest pasture (1000 hectares)							43.3
Land impacted for carbon sink potential - Mid - Restore productivity (1000 hectares)							2,576
Land impacted for carbon sink potential - Mid - Total impacted (over 30 years) (1000 hectares)							6,878

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

Item	2020	2025	2030	2035	2040	2045	2050
Monetary damages from air pollution - Coal (million 2019$)		98.6	0.084	0.083	0.061	0.038	0
Monetary damages from air pollution - Natural Gas (million 2019$)		28.7	14.7	9.34	5.49	2.56	1.47
Monetary damages from air pollution - Transportation (million 2019$)		218	224	223	205	167	117
Premature deaths from air pollution - Coal (deaths)		11.1	0.009	0.009	0.007	0.004	0
Premature deaths from air pollution - Natural Gas (deaths)		3.24	1.65	1.05	0.62	0.289	0.166
Premature deaths from air pollution - Transportation (deaths)		24.5	25.2	25.1	23.1	18.8	13.1

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

Item	2020	2025	2030	2035	2040	2045	2050
Commercial HVAC investment in 2020s - Cumulative 5-yr (million $2018)	0	5,003	5,574	0	0	0	0
Sales of cooking units - Electric Resistance (%)	41.9	54.6	83	88.6	88.9	88.9	88.9
Sales of cooking units - Gas (%)	58.1	45.4	17	11.4	11.1	11.1	11.1
Sales of space heating units - Electric Heat Pump (%)	1.58	19.8	62.6	88.7	92.5	92.6	92.7
Sales of space heating units - Electric Resistance (%)	1.76	3.39	4.14	6.37	6.83	6.86	6.85
Sales of space heating units - Fossil (%)	0	0.199	0.038	0.002	0	0	0

Table 25: *E+RE+ scenario - PILLAR 1: Efficiency/Electrification - Commercial (continued)*

Item	2020	2025	2030	2035	2040	2045	2050
Sales of space heating units - Gas Furnace (%)	96.7	76.6	33.3	4.92	0.721	0.496	0.493
Sales of water heating units - Electric Heat Pump (%)	0.016	7.95	44.7	60.9	62.8	62.9	62.9
Sales of water heating units - Electric Resistance (%)	0.796	4.99	22.9	34.8	36.6	36.7	36.7
Sales of water heating units - Gas Furnace (%)	99	86.7	32.1	3.86	0.201	0	0
Sales of water heating units - Other (%)	0.192	0.382	0.382	0.383	0.381	0.382	0.382

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

Item	2020	2025	2030	2035	2040	2045	2050
Electricity distribution capital invested - Cumulative 5-yr (billion $2018)		1.12	1.17	2.25	2.43	2.16	2.28

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

Item	2020	2025	2030	2035	2040	2045	2050
Final energy use - Commercial (PJ)	61.7	61.5	59.1	55.3	51.5	49.4	48.9
Final energy use - Industry (PJ)	35.8	36.3	35.9	36.6	38.7	39.4	40.1
Final energy use - Residential (PJ)	73.6	69.9	64.4	56.2	48.8	44.3	42
Final energy use - Transportation (PJ)	268	250	222	187	156	137	129

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

Item	2020	2025	2030	2035	2040	2045	2050
Residential HVAC investment in 2020s vs. REF - Cumulative 5-yr (billion $2018)	0	1.87	2.24	0	0	0	0
Sales of cooking units - Electric Resistance (%)	41.9	54.2	92.2	99.6	100	100	100
Sales of cooking units - Gas (%)	58.1	45.8	7.83	0.394	0	0	0
Sales of space heating units - Electric Heat Pump (%)	5.11	20.2	63.3	85.3	88.8	89.3	89
Sales of space heating units - Electric Resistance (%)	6.51	10.4	5.63	3.21	2.94	2.96	2.97
Sales of space heating units - Fossil (%)	10.2	14.7	10.2	7.32	6.18	5.78	6.11
Sales of space heating units - Gas (%)	78.2	54.7	20.9	4.15	2.05	1.95	1.94
Sales of water heating units - Electric Heat Pump (%)	0	7.63	42.7	57.5	59.2	59.2	59.2
Sales of water heating units - Electric Resistance (%)	11.7	24.2	31.3	38.3	39.4	39.5	39.5
Sales of water heating units - Gas Furnace (%)	87.3	67	24.8	2.98	0.155	0	0
Sales of water heating units - Other (%)	1.03	1.2	1.22	1.23	1.24	1.24	1.25

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

Item	2020	2025	2030	2035	2040	2045	2050
Light-duty vehicle capital costs - Cumulative 5-yr (million $2018)	0	350	897	1,453	2,201	2,395	2,284
Public EV charging plugs - DC Fast (1000 units)	0.099	0	0.64	0	2.8	0	4.53
Public EV charging plugs - L2 (1000 units)	0.151	0	15.4	0	67.5	0	109
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+ scenario - PILLAR 1: Efficiency/Electrification - Transportation (continued)*

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 (%)	1.71	1.95	1.32	0.424	0.077	0.013	0
Vehicle sales - Light-duty - EV (%)	3.39	13.6	44	80.8	96.2	99.3	100
Vehicle sales - Light-duty - gasoline (%)	90.8	79.8	51.4	17.5	3.42	0.594	0
Vehicle sales - Light-duty - hybrid (%)	3.91	4.17	3.04	1.15	0.276	0.059	0
Vehicle sales - Light-duty - hydrogen FC (%)	0.111	0.349	0.216	0.068	0.013	0.002	0
Vehicle sales - Light-duty - other (%)	0.109	0.105	0.07	0.025	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 FC (%)	0.196	1.27	6.33	15.2	19.1	19.9	20
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	8.47	15.1	7.55	2.52	8.42	7.45
Capital invested - Wind - Base (billion $2018)	0	19.3	19.8	27.2	19.8	11.5	22.3
Installed (cumulative) - OffshoreWind - Base land use assumptions (MW)	0	0	0	0	0	0	0
Installed (cumulative) - Solar - Base land use assumptions (MW)	853	7,175	19,767	26,615	29,036	37,616	45,657
Installed (cumulative) - Wind - Base land use assumptions (MW)	5,620	18,717	33,579	55,498	72,289	82,540	103,564

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

Item	2020	2025	2030	2035	2040	2045	2050
Solar - Base land use assumptions (GWh)	2,269	15,139	30,135	16,396	5,770	20,508	19,154
Solar - Constrained land use assumptions (GWh)	2,269	275	0	0	4,768	20,586	25,601
Wind - Base land use assumptions (GWh)	19,677	42,328	45,814	64,282	49,417	29,300	59,387
Wind - Constrained land use assumptions (GWh)	19,175	33,112	27,278	45,791	22,190	7,741	125,374

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Aggressive deployment - Corn-ethanol to energy grasses (1000 tCO2e/y)							0
Carbon sink potential - Aggressive deployment - Cropland measures (1000 tCO2e/y)							-506
Carbon sink potential - Aggressive deployment - Permanent conservation cover (1000 tCO2e/y)							-31.7
Carbon sink potential - Aggressive deployment - Total (1000 tCO2e/y)							-538
Carbon sink potential - Moderate deployment - Corn-ethanol to energy grasses (1000 tCO2e/y)							0
Carbon sink potential - Moderate deployment - Cropland measures (1000 tCO2e/y)							-261

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Moderate deployment - Permanent conservation cover (1000 tCO2e/y)							-15.8
Carbon sink potential - Moderate deployment - Total (1000 tCO2e/y)							-277
Land impacted for carbon sink - Aggressive deployment - Corn-ethanol to energy grasses (1000 hectares)							0
Land impacted for carbon sink - Aggressive deployment - Cropland measures (1000 hectares)							691
Land impacted for carbon sink - Aggressive deployment - Permanent conservation cover (1000 hectares)							48.6
Land impacted for carbon sink - Aggressive deployment - Total (1000 hectares)							739
Land impacted for carbon sink - Moderate deployment - Corn-ethanol to energy grasses (1000 hectares)							0
Land impacted for carbon sink - Moderate deployment - Cropland measures (1000 hectares)							358
Land impacted for carbon sink - Moderate deployment - Permanent conservation cover (1000 hectares)							24.3
Land impacted for carbon sink - Moderate deployment - Total (1000 hectares)							382

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)							-3,236
Carbon sink potential - High - All (not counting overlap) (1000 tCO2e/y)							-27,508
Carbon sink potential - High - Avoid deforestation (1000 tCO2e/y)							-1,156
Carbon sink potential - High - Extend rotation length (1000 tCO2e/y)							-9,681
Carbon sink potential - High - Improve plantations (1000 tCO2e/y)							-11.6
Carbon sink potential - High - Increase retention of HWP (1000 tCO2e/y)							-103
Carbon sink potential - High - Increase trees outside forests (1000 tCO2e/y)							-365
Carbon sink potential - High - Reforest cropland (1000 tCO2e/y)							-5,360
Carbon sink potential - High - Reforest pasture (1000 tCO2e/y)							-1,215
Carbon sink potential - High - Restore productivity (1000 tCO2e/y)							-6,378
Carbon sink potential - Low - Accelerate regeneration (1000 tCO2e/y)							-1,622
Carbon sink potential - Low - All (not counting overlap) (1000 tCO2e/y)							-10,623
Carbon sink potential - Low - Avoid deforestation (1000 tCO2e/y)							-193
Carbon sink potential - Low - Extend rotation length (1000 tCO2e/y)							-3,718

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Low - Improve plantations (1000 tCO2e/y)							-5.92
Carbon sink potential - Low - Increase retention of HWP (1000 tCO2e/y)							-34.4
Carbon sink potential - Low - Increase trees outside forests (1000 tCO2e/y)							-128
Carbon sink potential - Low - Reforest cropland (1000 tCO2e/y)							-2,680
Carbon sink potential - Low - Reforest pasture (1000 tCO2e/y)							-92.1
Carbon sink potential - Low - Restore productivity (1000 tCO2e/y)							-2,150
Carbon sink potential - Mid - Accelerate regeneration (1000 tCO2e/y)							-2,429
Carbon sink potential - Mid - All (not counting overlap) (1000 tCO2e/y)							-19,065
Carbon sink potential - Mid - Avoid deforestation (1000 tCO2e/y)							-674
Carbon sink potential - Mid - Extend rotation length (1000 tCO2e/y)							-6,700
Carbon sink potential - Mid - Improve plantations (1000 tCO2e/y)							-8.68
Carbon sink potential - Mid - Increase retention of HWP (1000 tCO2e/y)							-68.9
Carbon sink potential - Mid - Increase trees outside forests (1000 tCO2e/y)							-247
Carbon sink potential - Mid - Reforest cropland (1000 tCO2e/y)							-4,020
Carbon sink potential - Mid - Reforest pasture (1000 tCO2e/y)							-654
Carbon sink potential - Mid - Restore productivity (1000 tCO2e/y)							-4,264
Land impacted for carbon sink potential - High - Accelerate regeneration (1000 hectares)							529
Land impacted for carbon sink potential - High - Avoid deforestation (over 30 years) (1000 hectares)							157
Land impacted for carbon sink potential - High - Extend rotation length (1000 hectares)							4,937
Land impacted for carbon sink potential - High - Improve plantations (1000 hectares)							4.29
Land impacted for carbon sink potential - High - Increase retention of HWP (1000 hectares)							0
Land impacted for carbon sink potential - High - Increase trees outside forests (1000 hectares)							34.7
Land impacted for carbon sink potential - High - Reforest cropland (1000 hectares)							354
Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares)							34.5
Land impacted for carbon sink potential - High - Restore productivity (1000 hectares)							2,114
Land impacted for carbon sink potential - High - Total impacted (over 30 years) (1000 hectares)							8,165

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 - Low - Accelerate regeneration (1000 hectares)							265
Land impacted for carbon sink potential - Low - Avoid deforestation (over 30 years) (1000 hectares)							147
Land impacted for carbon sink potential - Low - Extend rotation length (1000 hectares)							1,891
Land impacted for carbon sink potential - Low - Improve plantations (1000 hectares)							2.15
Land impacted for carbon sink potential - Low - Increase retention of HWP (1000 hectares)							0
Land impacted for carbon sink potential - Low - Increase trees outside forests (1000 hectares)							18.3
Land impacted for carbon sink potential - Low - Reforest cropland (1000 hectares)							177
Land impacted for carbon sink potential - Low - Reforest pasture (1000 hectares)							5.99
Land impacted for carbon sink potential - Low - Restore productivity (1000 hectares)							1,279
Land impacted for carbon sink potential - Low - Total impacted (over 30 years) (1000 hectares)							3,786
Land impacted for carbon sink potential - Mid - Accelerate regeneration (1000 hectares)							397
Land impacted for carbon sink potential - Mid - Avoid deforestation (over 30 years) (1000 hectares)							152
Land impacted for carbon sink potential - Mid - Extend rotation length (1000 hectares)							3,414
Land impacted for carbon sink potential - Mid - Improve plantations (1000 hectares)							3.23
Land impacted for carbon sink potential - Mid - Increase retention of HWP (1000 hectares)							0
Land impacted for carbon sink potential - Mid - Increase trees outside forests (1000 hectares)							26.5
Land impacted for carbon sink potential - Mid - Reforest cropland (1000 hectares)							266
Land impacted for carbon sink potential - Mid - Reforest pasture (1000 hectares)							43.3
Land impacted for carbon sink potential - Mid - Restore productivity (1000 hectares)							2,576
Land impacted for carbon sink potential - Mid - Total impacted (over 30 years) (1000 hectares)							6,878

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

Item	2020	2025	2030	2035	2040	2045	2050
Monetary damages from air pollution - Coal (million 2019$)		98.6	0.084	0.083	0.061	0.038	0

Table 34: *E+RE+ scenario - IMPACTS - Health (continued)*

Item	2020	2025	2030	2035	2040	2045	2050
Monetary damages from air pollution - Natural Gas (million 2019$)		25.3	15	7.16	5.55	2.74	1.27
Monetary damages from air pollution - Transportation (million 2019$)		215	204	159	93.1	43	16.9
Premature deaths from air pollution - Coal (deaths)		11.1	0.009	0.009	0.007	0.004	0
Premature deaths from air pollution - Natural Gas (deaths)		2.86	1.69	0.808	0.626	0.31	0.144
Premature deaths from air pollution - Transportation (deaths)		24.2	23	17.8	10.5	4.84	1.9

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

Item	2020	2025	2030	2035	2040	2045	2050
Commercial HVAC investment in 2020s - Cumulative 5-yr (million $2018)	0	5,003	5,574	0	0	0	0
Sales of cooking units - Electric Resistance (%)	41.9	54.6	83	88.6	88.9	88.9	88.9
Sales of cooking units - Gas (%)	58.1	45.4	17	11.4	11.1	11.1	11.1
Sales of space heating units - Electric Heat Pump (%)	1.58	19.8	62.6	88.7	92.5	92.6	92.7
Sales of space heating units - Electric Resistance (%)	1.76	3.39	4.14	6.37	6.83	6.86	6.85
Sales of space heating units - Fossil (%)	0	0.199	0.038	0.002	0	0	0
Sales of space heating units - Gas Furnace (%)	96.7	76.6	33.3	4.92	0.721	0.496	0.493
Sales of water heating units - Electric Heat Pump (%)	0.016	7.95	44.7	60.9	62.8	62.9	62.9
Sales of water heating units - Electric Resistance (%)	0.796	4.99	22.9	34.8	36.6	36.7	36.7
Sales of water heating units - Gas Furnace (%)	99	86.7	32.1	3.86	0.201	0	0
Sales of water heating units - Other (%)	0.192	0.382	0.382	0.383	0.381	0.382	0.382

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

Item	2020	2025	2030	2035	2040	2045	2050
Electricity distribution capital invested - Cumulative 5-yr (billion $2018)		1.12	1.17	2.25	2.43	2.16	2.28

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

Item	2020	2025	2030	2035	2040	2045	2050
Final energy use - Commercial (PJ)	61.7	61.5	59.1	55.3	51.5	49.4	48.9
Final energy use - Industry (PJ)	35.8	36.3	35.9	36.6	38.7	39.4	40.1
Final energy use - Residential (PJ)	73.6	69.9	64.4	56.2	48.8	44.3	42
Final energy use - Transportation (PJ)	268	250	222	187	156	137	129

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

Item	2020	2025	2030	2035	2040	2045	2050
Residential HVAC investment in 2020s vs. REF - Cumulative 5-yr (billion $2018)	0	1.87	2.24	0	0	0	0
Sales of cooking units - Electric Resistance (%)	41.9	54.2	92.2	99.6	100	100	100
Sales of cooking units - Gas (%)	58.1	45.8	7.83	0.394	0	0	0
Sales of space heating units - Electric Heat Pump (%)	5.11	20.2	63.3	85.3	88.8	89.3	89
Sales of space heating units - Electric Resistance (%)	6.51	10.4	5.63	3.21	2.94	2.96	2.97

Table 38: *E+RE- scenario - PILLAR 1: Efficiency/Electrification - Residential (continued)*

Item	2020	2025	2030	2035	2040	2045	2050
Sales of space heating units - Fossil (%)	10.2	14.7	10.2	7.32	6.18	5.78	6.11
Sales of space heating units - Gas (%)	78.2	54.7	20.9	4.15	2.05	1.95	1.94
Sales of water heating units - Electric Heat Pump (%)	0	7.63	42.7	57.5	59.2	59.2	59.2
Sales of water heating units - Electric Resistance (%)	11.7	24.2	31.3	38.3	39.4	39.5	39.5
Sales of water heating units - Gas Furnace (%)	87.3	67	24.8	2.98	0.155	0	0
Sales of water heating units - Other (%)	1.03	1.2	1.22	1.23	1.24	1.24	1.25

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

Item	2020	2025	2030	2035	2040	2045	2050
Light-duty vehicle capital costs - Cumulative 5-yr (million $2018)	0	350	897	1,453	2,201	2,395	2,284
Public EV charging plugs - DC Fast (1000 units)	0.099	0	0.64	0	2.8	0	4.53
Public EV charging plugs - L2 (1000 units)	0.151	0	15.4	0	67.5	0	109
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 (%)	1.71	1.95	1.32	0.424	0.077	0.013	0
Vehicle sales - Light-duty - EV (%)	3.39	13.6	44	80.8	96.2	99.3	100
Vehicle sales - Light-duty - gasoline (%)	90.8	79.8	51.4	17.5	3.42	0.594	0
Vehicle sales - Light-duty - hybrid (%)	3.91	4.17	3.04	1.15	0.276	0.059	0
Vehicle sales - Light-duty - hydrogen FC (%)	0.111	0.349	0.216	0.068	0.013	0.002	0
Vehicle sales - Light-duty - other (%)	0.109	0.105	0.07	0.025	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 FC (%)	0.196	1.27	6.33	15.2	19.1	19.9	20
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*

Item	2020	2025	2030	2035	2040	2045	2050
Capital invested - Solar PV - Base (billion $2018)		12.8	9.98	9.31	5.41	3.1	0.516
Capital invested - Solar PV - Constrained (billion $2018)		0.154	0	0.56	0	0	0
Capital invested - Wind - Base (billion $2018)		8.91	9.12	16.6	9.93	5.4	11.8
Capital invested - Wind - Constrained (billion $2018)		9.36	7.91	10.9	7.51	6.07	11.5

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

Item	2020	2025	2030	2035	2040	2045	2050
Solar - Base land use assumptions (GWh)	2,269	22,994	19,969	20,219	12,458	7,560	1,325
Solar - Constrained land use assumptions (GWh)	2,269	275	0	1,233	0	0	0
Wind - Base land use assumptions (GWh)	13,439	19,599	22,241	41,764	25,262	14,169	32,451
Wind - Constrained land use assumptions (GWh)	13,392	18,866	17,026	22,163	15,030	11,929	23,740

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Aggressive deployment - Corn-ethanol to energy grasses (1000 tCO2e/y)							0
Carbon sink potential - Aggressive deployment - Cropland measures (1000 tCO2e/y)							-506
Carbon sink potential - Aggressive deployment - Permanent conservation cover (1000 tCO2e/y)							-31.7
Carbon sink potential - Aggressive deployment - Total (1000 tCO2e/y)							-538
Carbon sink potential - Moderate deployment - Corn-ethanol to energy grasses (1000 tCO2e/y)							0
Carbon sink potential - Moderate deployment - Cropland measures (1000 tCO2e/y)							-261
Carbon sink potential - Moderate deployment - Permanent conservation cover (1000 tCO2e/y)							-15.8
Carbon sink potential - Moderate deployment - Total (1000 tCO2e/y)							-277
Land impacted for carbon sink - Aggressive deployment - Corn-ethanol to energy grasses (1000 hectares)							0
Land impacted for carbon sink - Aggressive deployment - Cropland measures (1000 hectares)							691
Land impacted for carbon sink - Aggressive deployment - Permanent conservation cover (1000 hectares)							48.6
Land impacted for carbon sink - Aggressive deployment - Total (1000 hectares)							739
Land impacted for carbon sink - Moderate deployment - Corn-ethanol to energy grasses (1000 hectares)							0
Land impacted for carbon sink - Moderate deployment - Cropland measures (1000 hectares)							358
Land impacted for carbon sink - Moderate deployment - Permanent conservation cover (1000 hectares)							24.3
Land impacted for carbon sink - Moderate deployment - Total (1000 hectares)							382

Table 43: *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)							-3,236
Carbon sink potential - High - All (not counting overlap) (1000 tCO2e/y)							-27,508
Carbon sink potential - High - Avoid deforestation (1000 tCO2e/y)							-1,156
Carbon sink potential - High - Extend rotation length (1000 tCO2e/y)							-9,681
Carbon sink potential - High - Improve plantations (1000 tCO2e/y)							-11.6
Carbon sink potential - High - Increase retention of HWP (1000 tCO2e/y)							-103

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - High - Increase trees outside forests (1000 tCO2e/y)							-365
Carbon sink potential - High - Reforest cropland (1000 tCO2e/y)							-5,360
Carbon sink potential - High - Reforest pasture (1000 tCO2e/y)							-1,215
Carbon sink potential - High - Restore productivity (1000 tCO2e/y)							-6,378
Carbon sink potential - Low - Accelerate regeneration (1000 tCO2e/y)							-1,622
Carbon sink potential - Low - All (not counting overlap) (1000 tCO2e/y)							-10,623
Carbon sink potential - Low - Avoid deforestation (1000 tCO2e/y)							-193
Carbon sink potential - Low - Extend rotation length (1000 tCO2e/y)							-3,718
Carbon sink potential - Low - Improve plantations (1000 tCO2e/y)							-5.92
Carbon sink potential - Low - Increase retention of HWP (1000 tCO2e/y)							-34.4
Carbon sink potential - Low - Increase trees outside forests (1000 tCO2e/y)							-128
Carbon sink potential - Low - Reforest cropland (1000 tCO2e/y)							-2,680
Carbon sink potential - Low - Reforest pasture (1000 tCO2e/y)							-92.1
Carbon sink potential - Low - Restore productivity (1000 tCO2e/y)							-2,150
Carbon sink potential - Mid - Accelerate regeneration (1000 tCO2e/y)							-2,429
Carbon sink potential - Mid - All (not counting overlap) (1000 tCO2e/y)							-19,065
Carbon sink potential - Mid - Avoid deforestation (1000 tCO2e/y)							-674
Carbon sink potential - Mid - Extend rotation length (1000 tCO2e/y)							-6,700
Carbon sink potential - Mid - Improve plantations (1000 tCO2e/y)							-8.68
Carbon sink potential - Mid - Increase retention of HWP (1000 tCO2e/y)							-68.9
Carbon sink potential - Mid - Increase trees outside forests (1000 tCO2e/y)							-247
Carbon sink potential - Mid - Reforest cropland (1000 tCO2e/y)							-4,020
Carbon sink potential - Mid - Reforest pasture (1000 tCO2e/y)							-654
Carbon sink potential - Mid - Restore productivity (1000 tCO2e/y)							-4,264
Land impacted for carbon sink potential - High - Accelerate regeneration (1000 hectares)							529
Land impacted for carbon sink potential - High - Avoid deforestation (over 30 years) (1000 hectares)							157
Land impacted for carbon sink potential - High - Extend rotation length (1000 hectares)							4,937
Land impacted for carbon sink potential - High - Improve plantations (1000 hectares)							4.29

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

Item	2020	2025	2030	2035	2040	2045	2050
Land impacted for carbon sink potential - High - Increase retention of HWP (1000 hectares)							0
Land impacted for carbon sink potential - High - Increase trees outside forests (1000 hectares)							34.7
Land impacted for carbon sink potential - High - Reforest cropland (1000 hectares)							354
Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares)							34.5
Land impacted for carbon sink potential - High - Restore productivity (1000 hectares)							2,114
Land impacted for carbon sink potential - High - Total impacted (over 30 years) (1000 hectares)							8,165
Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)							265
Land impacted for carbon sink potential - Low - Avoid deforestation (over 30 years) (1000 hectares)							147
Land impacted for carbon sink potential - Low - Extend rotation length (1000 hectares)							1,891
Land impacted for carbon sink potential - Low - Improve plantations (1000 hectares)							2.15
Land impacted for carbon sink potential - Low - Increase retention of HWP (1000 hectares)							0
Land impacted for carbon sink potential - Low - Increase trees outside forests (1000 hectares)							18.3
Land impacted for carbon sink potential - Low - Reforest cropland (1000 hectares)							177
Land impacted for carbon sink potential - Low - Reforest pasture (1000 hectares)							5.99
Land impacted for carbon sink potential - Low - Restore productivity (1000 hectares)							1,279
Land impacted for carbon sink potential - Low - Total impacted (over 30 years) (1000 hectares)							3,786
Land impacted for carbon sink potential - Mid - Accelerate regeneration (1000 hectares)							397
Land impacted for carbon sink potential - Mid - Avoid deforestation (over 30 years) (1000 hectares)							152
Land impacted for carbon sink potential - Mid - Extend rotation length (1000 hectares)							3,414
Land impacted for carbon sink potential - Mid - Improve plantations (1000 hectares)							3.23
Land impacted for carbon sink potential - Mid - Increase retention of HWP (1000 hectares)							0
Land impacted for carbon sink potential - Mid - Increase trees outside forests (1000 hectares)							26.5

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

Item	2020	2025	2030	2035	2040	2045	2050
Land impacted for carbon sink potential - Mid - Reforest cropland (1000 hectares)							266
Land impacted for carbon sink potential - Mid - Reforest pasture (1000 hectares)							43.3
Land impacted for carbon sink potential - Mid - Restore productivity (1000 hectares)							2,576
Land impacted for carbon sink potential - Mid - Total impacted (over 30 years) (1000 hectares)							6,878

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

Item	2020	2025	2030	2035	2040	2045	2050
Monetary damages from air pollution - Coal (million 2019$)		98.6	0.084	0.083	0.061	0.038	0
Monetary damages from air pollution - Natural Gas (million 2019$)		29	18.4	16.9	19.1	9.21	2.75
Monetary damages from air pollution - Transportation (million 2019$)		215	204	159	93.1	43	16.9
Premature deaths from air pollution - Coal (deaths)		11.1	0.009	0.009	0.007	0.004	0
Premature deaths from air pollution - Natural Gas (deaths)		3.27	2.08	1.91	2.16	1.04	0.31
Premature deaths from air pollution - Transportation (deaths)		24.2	23	17.8	10.5	4.84	1.9

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

Item	2020	2025	2030	2035	2040	2045	2050
Commercial HVAC investment in 2020s - Cumulative 5-yr (million $2018)	0	5,000	5,547	0	0	0	0
Sales of cooking units - Electric Resistance (%)	41.9	46.2	50.2	60.8	75.4	84.6	87.8
Sales of cooking units - Gas (%)	58.1	53.8	49.8	39.2	24.6	15.4	12.2
Sales of space heating units - Electric Heat Pump (%)	1.58	12.8	17.7	32.2	57.3	78.6	88.4
Sales of space heating units - Electric Resistance (%)	1.76	3.37	3.45	3.77	4.61	5.79	6.51
Sales of space heating units - Fossil (%)	0	0.23	0.214	0.159	0.078	0.025	0.007
Sales of space heating units - Gas Furnace (%)	96.7	83.6	78.7	63.9	38	15.6	5.05
Sales of water heating units - Electric Heat Pump (%)	0.016	1.51	5.7	18	38.2	53.7	60.3
Sales of water heating units - Electric Resistance (%)	0.796	2.19	4.23	10.3	21	30.4	34.7
Sales of water heating units - Gas Furnace (%)	99	95.9	89.7	71.3	40.4	15.6	4.61
Sales of water heating units - Other (%)	0.192	0.382	0.382	0.383	0.381	0.382	0.382

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

Item	2020	2025	2030	2035	2040	2045	2050
Electricity distribution capital invested - Cumulative 5-yr (billion $2018)		0.866	0.891	1.24	1.3	1.97	2.11

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

Item	2020	2025	2030	2035	2040	2045	2050
Final energy use - Commercial (PJ)	61.7	61.6	61.1	60.2	58.4	56.2	54.2

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

Item	2020	2025	2030	2035	2040	2045	2050
Final energy use - Industry (PJ)	35.8	36.3	36.1	37.2	39.6	40.4	41.1
Final energy use - Residential (PJ)	73.6	70.2	68	65.4	60.8	55.1	49.4
Final energy use - Transportation (PJ)	268	252	231	214	201	186	169

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

Item	2020	2025	2030	2035	2040	2045	2050
Residential HVAC investment in 2020s vs. REF - Cumulative 5-yr (billion $2018)	0	1.86	2.24	0	0	0	0
Sales of cooking units - Electric Resistance (%)	41.7	43.2	48.5	62.6	82.2	94.2	98.5
Sales of cooking units - Gas (%)	58.3	56.8	51.5	37.4	17.8	5.75	1.55
Sales of space heating units - Electric Heat Pump (%)	5.11	12.8	17.7	32.4	57.3	77.2	85.4
Sales of space heating units - Electric Resistance (%)	6.51	11.2	10.6	9.06	6.48	4.32	3.36
Sales of space heating units - Fossil (%)	10.2	15.5	15.4	13.1	9.22	6.81	6.5
Sales of space heating units - Gas (%)	78.2	60.4	56.3	45.5	27	11.7	4.76
Sales of water heating units - Electric Heat Pump (%)	0	1.41	5.41	17.1	36.2	50.8	56.8
Sales of water heating units - Electric Resistance (%)	11.7	23.2	24.2	26.7	31.4	36	38.4
Sales of water heating units - Gas Furnace (%)	87.3	74.1	69.2	55	31.1	12	3.54
Sales of water heating units - Other (%)	1.03	1.2	1.22	1.23	1.24	1.24	1.25

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

Item	2020	2025	2030	2035	2040	2045	2050
Light-duty vehicle capital costs - Cumulative 5-yr (million $2018)	0	0	56.7	119	402	1,263	1,841
Public EV charging plugs - DC Fast (1000 units)	0.099	0	0.199	0	1.04	0	2.9
Public EV charging plugs - L2 (1000 units)	0.151	0	4.8	0	25.1	0	69.9
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 (%)	1.72	2.1	2.09	1.67	1.08	0.558	0.238
Vehicle sales - Light-duty - EV (%)	1.7	4.28	11	24.5	46.9	71.1	87.2
Vehicle sales - Light-duty - gasoline (%)	92.3	88.2	80.9	68.4	47.9	25.9	11.4
Vehicle sales - Light-duty - hybrid (%)	4.04	4.88	5.53	5.11	3.91	2.35	1.15
Vehicle sales - Light-duty - hydrogen FC (%)	0.113	0.385	0.335	0.259	0.186	0.104	0.048
Vehicle sales - Light-duty - other (%)	0.11	0.113	0.104	0.091	0.066	0.037	0.017
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 FC (%)	0.166	0.485	1.37	3.58	7.86	13.2	17
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	0.058
Capital invested - Biomass w/ccu power plant (billion $2018)	0	0	0	0	0	0	1.59

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	57.5
Biomass w/ccu power plant (GWh)	0	0	0	0	0	0	1,784

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	0	0	59.9	173
Conversion capital investment - Cumulative 5-yr (million $2018)	0	0	0	0	0	683	1,529
Number of facilities - Allam power w ccu (quantity)	0	0	0	0	0	0	1
Number of facilities - Beccs hydrogen (quantity)	0	0	0	0	0	1	1
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 (quantity)	0	0	0	0	0	0	1
Number of facilities - Pyrolysis (quantity)	0	0	0	0	0	0	0
Number of facilities - Pyrolysis ccu (quantity)	0	0	0	0	0	0	0
Number of facilities - Sng (quantity)	0	0	0	0	0	0	0
Number of facilities - Sng ccu (quantity)	0	0	0	0	0	0	0

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

Item	2020	2025	2030	2035	2040	2045	2050
Annual - All (MMT)		0	0	0	0	0.88	2.68
Annual - BECCS (MMT)		0	0	0	0	0.88	2.68
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	0	0	0.88	3.56
Cumulative - BECCS (MMT)		0	0	0	0	0.88	3.56
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	0	0	0	9.01	200
Cumulative investment - All (million $2018)		0	0	0	0	6.22	152
Cumulative investment - Spur (million $2018)		0	0	0	0	6.22	152
Cumulative investment - Trunk (million $2018)		0	0	0	0	0	0
Spur (km)		0	0	0	0	9.01	200
Trunk (km)		0	0	0	0	0	0

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

Item	2020	2025	2030	2035	2040	2045	2050
CO2 storage (MMT)		0	1.85	6.42	11.9	15.8	16.7
Injection wells (wells)		0	2	6	10	16	20
Resource characterization, appraisal, permitting costs (million $2020)		5.15	127	204	204	204	204
Wells and facilities construction costs (million $2020)		0	40.3	157	280	468	581

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Aggressive deployment - Corn-ethanol to energy grasses (1000 tCO2e/y)							-34.2
Carbon sink potential - Aggressive deployment - Cropland measures (1000 tCO2e/y)							-482
Carbon sink potential - Aggressive deployment - Cropland to woody energy crops (1000 tCO2e/y)							0
Carbon sink potential - Aggressive deployment - Pasture to energy crops (1000 tCO2e/y)							0
Carbon sink potential - Aggressive deployment - Permanent conservation cover (1000 tCO2e/y)							-29
Carbon sink potential - Aggressive deployment - Total (1000 tCO2e/y)							-546
Carbon sink potential - Moderate deployment - Corn-ethanol to energy grasses (1000 tCO2e/y)							-34.2
Carbon sink potential - Moderate deployment - Cropland measures (1000 tCO2e/y)							-248
Carbon sink potential - Moderate deployment - Cropland to woody energy crops (1000 tCO2e/y)							0
Carbon sink potential - Moderate deployment - Pasture to energy crops (1000 tCO2e/y)							0
Carbon sink potential - Moderate deployment - Permanent conservation cover (1000 tCO2e/y)							-14.5
Carbon sink potential - Moderate deployment - Total (1000 tCO2e/y)							-297
Land impacted for carbon sink - Aggressive deployment - Corn-ethanol to energy grasses (1000 hectares)							37.6
Land impacted for carbon sink - Aggressive deployment - Cropland measures (1000 hectares)							1,615
Land impacted for carbon sink - Aggressive deployment - Cropland to woody energy crops (1000 hectares)							3.18
Land impacted for carbon sink - Aggressive deployment - Pasture to energy crops (1000 hectares)							0
Land impacted for carbon sink - Aggressive deployment - Permanent conservation cover (1000 hectares)							44.5
Land impacted for carbon sink - Aggressive deployment - Total (1000 hectares)							1,700

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 deployment - Corn-ethanol to energy grasses (1000 hectares)							37.6
Land impacted for carbon sink - Moderate deployment - Cropland measures (1000 hectares)							338
Land impacted for carbon sink - Moderate deployment - Cropland to woody energy crops (1000 hectares)							3.18
Land impacted for carbon sink - Moderate deployment - Pasture to energy crops (1000 hectares)							0
Land impacted for carbon sink - Moderate deployment - Permanent conservation cover (1000 hectares)							22.3
Land impacted for carbon sink - Moderate deployment - Total (1000 hectares)							401

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - High - Accelerate regeneration (1000 tCO2e/y)							-3,236
Carbon sink potential - High - All (not counting overlap) (1000 tCO2e/y)							-27,508
Carbon sink potential - High - Avoid deforestation (1000 tCO2e/y)							-1,156
Carbon sink potential - High - Extend rotation length (1000 tCO2e/y)							-9,681
Carbon sink potential - High - Improve plantations (1000 tCO2e/y)							-11.6
Carbon sink potential - High - Increase retention of HWP (1000 tCO2e/y)							-103
Carbon sink potential - High - Increase trees outside forests (1000 tCO2e/y)							-365
Carbon sink potential - High - Reforest cropland (1000 tCO2e/y)							-5,360
Carbon sink potential - High - Reforest pasture (1000 tCO2e/y)							-1,215
Carbon sink potential - High - Restore productivity (1000 tCO2e/y)							-6,378
Carbon sink potential - Low - Accelerate regeneration (1000 tCO2e/y)							-1,622
Carbon sink potential - Low - All (not counting overlap) (1000 tCO2e/y)							-10,623
Carbon sink potential - Low - Avoid deforestation (1000 tCO2e/y)							-193
Carbon sink potential - Low - Extend rotation length (1000 tCO2e/y)							-3,718
Carbon sink potential - Low - Improve plantations (1000 tCO2e/y)							-5.92
Carbon sink potential - Low - Increase retention of HWP (1000 tCO2e/y)							-34.4
Carbon sink potential - Low - Increase trees outside forests (1000 tCO2e/y)							-128
Carbon sink potential - Low - Reforest cropland (1000 tCO2e/y)							-2,680
Carbon sink potential - Low - Reforest pasture (1000 tCO2e/y)							-92.1
Carbon sink potential - Low - Restore productivity (1000 tCO2e/y)							-2,150

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Mid - Accelerate regeneration (1000 tCO2e/y)							-2,429
Carbon sink potential - Mid - All (not counting overlap) (1000 tCO2e/y)							-19,065
Carbon sink potential - Mid - Avoid deforestation (1000 tCO2e/y)							-674
Carbon sink potential - Mid - Extend rotation length (1000 tCO2e/y)							-6,700
Carbon sink potential - Mid - Improve plantations (1000 tCO2e/y)							-8.68
Carbon sink potential - Mid - Increase retention of HWP (1000 tCO2e/y)							-68.9
Carbon sink potential - Mid - Increase trees outside forests (1000 tCO2e/y)							-247
Carbon sink potential - Mid - Reforest cropland (1000 tCO2e/y)							-4,020
Carbon sink potential - Mid - Reforest pasture (1000 tCO2e/y)							-654
Carbon sink potential - Mid - Restore productivity (1000 tCO2e/y)							-4,264
Land impacted for carbon sink potential - High - Accelerate regeneration (1000 hectares)							529
Land impacted for carbon sink potential - High - Avoid deforestation (over 30 years) (1000 hectares)							157
Land impacted for carbon sink potential - High - Extend rotation length (1000 hectares)							4,937
Land impacted for carbon sink potential - High - Improve plantations (1000 hectares)							4.29
Land impacted for carbon sink potential - High - Increase retention of HWP (1000 hectares)							0
Land impacted for carbon sink potential - High - Increase trees outside forests (1000 hectares)							34.7
Land impacted for carbon sink potential - High - Reforest cropland (1000 hectares)							354
Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares)							34.5
Land impacted for carbon sink potential - High - Restore productivity (1000 hectares)							2,114
Land impacted for carbon sink potential - High - Total impacted (over 30 years) (1000 hectares)							8,165
Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)							265
Land impacted for carbon sink potential - Low - Avoid deforestation (over 30 years) (1000 hectares)							147
Land impacted for carbon sink potential - Low - Extend rotation length (1000 hectares)							1,891
Land impacted for carbon sink potential - Low - Improve plantations (1000 hectares)							2.15

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 - Low - Increase retention of HWP (1000 hectares)							0
Land impacted for carbon sink potential - Low - Increase trees outside forests (1000 hectares)							18.3
Land impacted for carbon sink potential - Low - Reforest cropland (1000 hectares)							177
Land impacted for carbon sink potential - Low - Reforest pasture (1000 hectares)							5.99
Land impacted for carbon sink potential - Low - Restore productivity (1000 hectares)							1,279
Land impacted for carbon sink potential - Low - Total impacted (over 30 years) (1000 hectares)							3,786
Land impacted for carbon sink potential - Mid - Accelerate regeneration (1000 hectares)							397
Land impacted for carbon sink potential - Mid - Avoid deforestation (over 30 years) (1000 hectares)							152
Land impacted for carbon sink potential - Mid - Extend rotation length (1000 hectares)							3,414
Land impacted for carbon sink potential - Mid - Improve plantations (1000 hectares)							3.23
Land impacted for carbon sink potential - Mid - Increase retention of HWP (1000 hectares)							0
Land impacted for carbon sink potential - Mid - Increase trees outside forests (1000 hectares)							26.5
Land impacted for carbon sink potential - Mid - Reforest cropland (1000 hectares)							266
Land impacted for carbon sink potential - Mid - Reforest pasture (1000 hectares)							43.3
Land impacted for carbon sink potential - Mid - Restore productivity (1000 hectares)							2,576
Land impacted for carbon sink potential - Mid - Total impacted (over 30 years) (1000 hectares)							6,878

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

Item	2020	2025	2030	2035	2040	2045	2050
Monetary damages from air pollution - Coal (million 2019$)		98.6	0.084	0.083	0.061	0.038	0
Monetary damages from air pollution - Natural Gas (million 2019$)		26.9	13.9	10.1	7.96	5.51	2.67
Monetary damages from air pollution - Transportation (million 2019$)		218	224	223	205	167	117
Premature deaths from air pollution - Coal (deaths)		11.1	0.009	0.009	0.007	0.004	0
Premature deaths from air pollution - Natural Gas (deaths)		3.03	1.57	1.14	0.899	0.622	0.302
Premature deaths from air pollution - Transportation (deaths)		24.5	25.2	25.1	23.1	18.8	13.1

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

Item	2020	2025	2030	2035	2040	2045	2050
Commercial HVAC investment in 2020s - Cumulative 5-yr (million $2018)	0	4,936	5,160	0	0	0	0
Sales of cooking units - Electric Resistance (%)	41.9	44.7	44.7	44.6	44.4	44.5	44.6
Sales of cooking units - Gas (%)	58.1	55.3	55.3	55.4	55.6	55.5	55.4
Sales of space heating units - Electric Heat Pump (%)	1.58	19.9	53.5	75.1	78.5	78.8	78.8
Sales of space heating units - Electric Resistance (%)	1.76	4.5	9.3	15.8	20	20.6	20.7
Sales of space heating units - Fossil (%)	0	0.211	0.115	0.034	0.005	0	0
Sales of space heating units - Gas Furnace (%)	96.7	75.4	37.1	9.08	1.57	0.556	0.495
Sales of water heating units - Electric Heat Pump (%)	0.016	0.03	0.03	0.03	0.03	0.03	0.03
Sales of water heating units - Electric Resistance (%)	0.796	1.46	1.46	1.47	1.46	1.47	1.47
Sales of water heating units - Gas Furnace (%)	99	98.1	98.1	98.1	98.1	98.1	98.1
Sales of water heating units - Other (%)	0.192	0.382	0.382	0.383	0.381	0.382	0.382

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

Item	2020	2025	2030	2035	2040	2045	2050
Electricity distribution capital invested - Cumulative 5-yr (billion $2018)		0.941	0.974	1.68	1.79	1.79	1.89

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

Item	2020	2025	2030	2035	2040	2045	2050
Final energy use - Commercial (PJ)	61.7	62.9	63.8	63.9	64.3	66	69.1
Final energy use - Industry (PJ)	35.8	37.5	38.4	40	41.7	44.3	47
Final energy use - Residential (PJ)	73.6	70.7	70.1	70.3	71.2	72.7	74
Final energy use - Transportation (PJ)	268	252	233	221	221	228	236

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

Item	2020	2025	2030	2035	2040	2045	2050
Residential HVAC investment in 2020s vs. REF - Cumulative 5-yr (billion $2018)	0	1.8	1.89	0	0	0	0
Sales of cooking units - Electric Resistance (%)	41.1	41.1	41.1	41.1	41.1	41.1	41.1
Sales of cooking units - Gas (%)	58.9	58.9	58.9	58.9	58.9	58.9	58.9
Sales of space heating units - Electric Heat Pump (%)	3.87	20.3	20.9	21.9	22.8	23.5	24.1
Sales of space heating units - Electric Resistance (%)	6.66	10.4	10.2	10.1	9.98	9.54	8.77
Sales of space heating units - Fossil (%)	10.3	13.6	13.9	13.5	12	11	11.9
Sales of space heating units - Gas (%)	79.2	55.7	55	54.5	55.3	55.9	55.2
Sales of water heating units - Electric Heat Pump (%)	0	0	0	0	0	0	0
Sales of water heating units - Electric Resistance (%)	11.7	23	23.1	23.2	23.3	23.3	23.4
Sales of water heating units - Gas Furnace (%)	87.3	75.8	75.7	75.6	75.5	75.4	75.4
Sales of water heating units - Other (%)	1.03	1.2	1.22	1.23	1.24	1.24	1.25

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 (%)	1.71	2.1	2.21	2.06	1.86	1.73	1.65
Vehicle sales - Light-duty - EV (%)	3.04	4.93	5.65	6.91	8.45	9.89	11
Vehicle sales - Light-duty - gasoline (%)	91.1	87.7	85.8	84.1	82.2	80.2	78.6
Vehicle sales - Light-duty - hybrid (%)	3.93	4.8	5.9	6.47	7.08	7.73	8.29
Vehicle sales - Light-duty - hydrogen FC (%)	0.112	0.382	0.355	0.318	0.316	0.318	0.329
Vehicle sales - Light-duty - other (%)	0.109	0.113	0.11	0.11	0.11	0.109	0.112
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 FC (%)	0.175	0.208	0.242	0.285	0.339	0.409	0.487
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 regeneration (1000 tCO2e/y)							-3,236
Carbon sink potential - High - All (not counting overlap) (1000 tCO2e/y)							-27,508
Carbon sink potential - High - Avoid deforestation (1000 tCO2e/y)							-1,156
Carbon sink potential - High - Extend rotation length (1000 tCO2e/y)							-9,681
Carbon sink potential - High - Improve plantations (1000 tCO2e/y)							-11.6
Carbon sink potential - High - Increase retention of HWP (1000 tCO2e/y)							-103
Carbon sink potential - High - Increase trees outside forests (1000 tCO2e/y)							-365
Carbon sink potential - High - Reforest cropland (1000 tCO2e/y)							-5,360
Carbon sink potential - High - Reforest pasture (1000 tCO2e/y)							-1,215
Carbon sink potential - High - Restore productivity (1000 tCO2e/y)							-6,378
Carbon sink potential - Low - Accelerate regeneration (1000 tCO2e/y)							-1,622
Carbon sink potential - Low - All (not counting overlap) (1000 tCO2e/y)							-10,623
Carbon sink potential - Low - Avoid deforestation (1000 tCO2e/y)							-193
Carbon sink potential - Low - Extend rotation length (1000 tCO2e/y)							-3,718
Carbon sink potential - Low - Improve plantations (1000 tCO2e/y)							-5.92
Carbon sink potential - Low - Increase retention of HWP (1000 tCO2e/y)							-34.4
Carbon sink potential - Low - Increase trees outside forests (1000 tCO2e/y)							-128
Carbon sink potential - Low - Reforest cropland (1000 tCO2e/y)							-2,680

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Low - Reforest pasture (1000 tCO2e/y)							-92.1
Carbon sink potential - Low - Restore productivity (1000 tCO2e/y)							-2,150
Carbon sink potential - Mid - Accelerate regeneration (1000 tCO2e/y)							-2,429
Carbon sink potential - Mid - All (not counting overlap) (1000 tCO2e/y)							-19,065
Carbon sink potential - Mid - Avoid deforestation (1000 tCO2e/y)							-674
Carbon sink potential - Mid - Extend rotation length (1000 tCO2e/y)							-6,700
Carbon sink potential - Mid - Improve plantations (1000 tCO2e/y)							-8.68
Carbon sink potential - Mid - Increase retention of HWP (1000 tCO2e/y)							-68.9
Carbon sink potential - Mid - Increase trees outside forests (1000 tCO2e/y)							-247
Carbon sink potential - Mid - Reforest cropland (1000 tCO2e/y)							-4,020
Carbon sink potential - Mid - Reforest pasture (1000 tCO2e/y)							-654
Carbon sink potential - Mid - Restore productivity (1000 tCO2e/y)							-4,264
Land impacted for carbon sink potential - High - Accelerate regeneration (1000 hectares)							529
Land impacted for carbon sink potential - High - Avoid deforestation (over 30 years) (1000 hectares)							157
Land impacted for carbon sink potential - High - Extend rotation length (1000 hectares)							4,937
Land impacted for carbon sink potential - High - Improve plantations (1000 hectares)							4.29
Land impacted for carbon sink potential - High - Increase retention of HWP (1000 hectares)							0
Land impacted for carbon sink potential - High - Increase trees outside forests (1000 hectares)							34.7
Land impacted for carbon sink potential - High - Reforest cropland (1000 hectares)							354
Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares)							34.5
Land impacted for carbon sink potential - High - Restore productivity (1000 hectares)							2,114
Land impacted for carbon sink potential - High - Total impacted (over 30 years) (1000 hectares)							8,165
Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)							265
Land impacted for carbon sink potential - Low - Avoid deforestation (over 30 years) (1000 hectares)							147
Land impacted for carbon sink potential - Low - Extend rotation length (1000 hectares)							1,891

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

Item	2020	2025	2030	2035	2040	2045	2050
Land impacted for carbon sink potential - Low - Improve plantations (1000 hectares)							2.15
Land impacted for carbon sink potential - Low - Increase retention of HWP (1000 hectares)							0
Land impacted for carbon sink potential - Low - Increase trees outside forests (1000 hectares)							18.3
Land impacted for carbon sink potential - Low - Reforest cropland (1000 hectares)							177
Land impacted for carbon sink potential - Low - Reforest pasture (1000 hectares)							5.99
Land impacted for carbon sink potential - Low - Restore productivity (1000 hectares)							1,279
Land impacted for carbon sink potential - Low - Total impacted (over 30 years) (1000 hectares)							3,786
Land impacted for carbon sink potential - Mid - Accelerate regeneration (1000 hectares)							397
Land impacted for carbon sink potential - Mid - Avoid deforestation (over 30 years) (1000 hectares)							152
Land impacted for carbon sink potential - Mid - Extend rotation length (1000 hectares)							3,414
Land impacted for carbon sink potential - Mid - Improve plantations (1000 hectares)							3.23
Land impacted for carbon sink potential - Mid - Increase retention of HWP (1000 hectares)							0
Land impacted for carbon sink potential - Mid - Increase trees outside forests (1000 hectares)							26.5
Land impacted for carbon sink potential - Mid - Reforest cropland (1000 hectares)							266
Land impacted for carbon sink potential - Mid - Reforest pasture (1000 hectares)							43.3
Land impacted for carbon sink potential - Mid - Restore productivity (1000 hectares)							2,576
Land impacted for carbon sink potential - Mid - Total impacted (over 30 years) (1000 hectares)							6,878

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)	-11.8		3.33				0.955
Business-as-usual carbon sink - Retained in Hardwood Products (Mt CO2e/y)	-0.028		-0.058				-0.061
Business-as-usual carbon sink - Total (Mt CO2e/y)	-11.8		3.27				0.894

Table 66: *REF scenario - IMPACTS - Health*

Item	2020	2025	2030	2035	2040	2045	2050
Monetary damages from air pollution - Coal (million 2019$)		184	106	47.7	36.7	32.8	31.1
Monetary damages from air pollution - Natural Gas (million 2019$)		31.8	34.1	35.5	27.3	28.5	24.5
Monetary damages from air pollution - Transportation (million 2019$)		218	228	238	250	262	274
Premature deaths from air pollution - Coal (deaths)		20.8	12	5.38	4.14	3.71	3.52
Premature deaths from air pollution - Natural Gas (deaths)		3.59	3.85	4	3.08	3.21	2.76
Premature deaths from air pollution - Transportation (deaths)		24.5	25.6	26.8	28.1	29.5	30.9