

# Net-Zero America - south carolina 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 -		15,755	17,550				
Cumulative 5-yr (million \$2018)							
Sales of cooking units - Electric	32	46	79.9	86.5	86.9	86.9	86.9
Resistance (%)							
Sales of cooking units - Gas (%)	68	54	20.1	13.5	13.1	13.1	13.1
Sales of space heating units - Electric	10.1	27.5	70.6	83.9	85.2	85.2	85.2
Heat Pump (%)							
Sales of space heating units - Electric	9.29	8.33	10.3	12.4	12.9	12.8	12.8
Resistance (%)							
Sales of space heating units - Fossil (%)	2.15	3.92	0.743	0.032	0	0	0
Sales of space heating units - Gas Furnace	78.5	60.3	18.3	3.66	1.98	1.94	1.94
(%)							
Sales of water heating units - Electric	0.316	10.5	54.5	64.3	64.7	64.8	64.8
Heat Pump (%)							
Sales of water heating units - Electric	7.81	11	28.4	32.3	32.5	32.5	32.5
Resistance (%)							
Sales of water heating units - Gas Furnace	88	74.5	14.1	0.593	0	0	0
(%)							
Sales of water heating units - Other (%)	3.86	4.03	2.99	2.74	2.74	2.73	2.73

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

Item	2020	2025	2030	2035	2040	2045	2050
Electricity distribution capital invested -		3.55	3.63	5.67	5.98	4.97	5.12
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)	114	114	111	106	101	100	102
Final energy use - Industry (PJ)	358	374	380	387	398	399	404
Final energy use - Residential (PJ)	158	150	141	129	119	115	113
Final energy use - Transportation (PJ)	463	438	386	323	267	233	218

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

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

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

Item	2020	2025	2030	2035	2040	2045	2050
Light-duty vehicle capital costs -		856	2,191	3,557	5,385	5,864	5,589
Cumulative 5-yr (million \$2018)							
Public EV charging plugs - DC Fast (1000	0.1		1.63		7.19		11.6
units)							
Public EV charging plugs - L2 (1000 units)	0.476		39.1		173		280
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 (%)	1.47	1.74	1.23	0.391	0.073	0.013	0
Vehicle sales - Light-duty - EV (%)	4.18	16	47.7	82.3	96.4	99.3	100
Vehicle sales - Light-duty - gasoline (%)	89.5	77.1	47.5	16	3.23	0.588	0
Vehicle sales - Light-duty - hybrid (%)	4.68	4.73	3.3	1.22	0.298	0.066	0
Vehicle sales - Light-duty - hydrogen FC	0.11	0.335	0.197	0.061	0.012	0.002	0
(%)							
Vehicle sales - Light-duty - other (%)	0.098	0.094	0.061	0.021	0.004	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	0	0.01	0
Capital invested - Biomass w/ccu power plant (billion \$2018)	0	0	0	0	4.36	5.17	0
Capital invested - Offshore Wind - Base (billion \$2018)		0	0	0	3.68	14.2	0
Capital invested - Offshore Wind - Constrained (billion \$2018)		0	0	0	4.4	14.7	0
Capital invested - Solar PV - Base (billion \$2018)		0	35.5	14.2	14.3	9.91	10
Capital invested - Solar PV - Constrained (billion \$2018)		2.3	37.4	16.2	10.5	9.49	9.42
Installed renewables - OffshoreWind - Base land use assumptions (MW)	0	0	0	0	2,121	11,769	11,769
Installed renewables - OffshoreWind - Constrained land use assumptions (MW)	0	0	0	0	2,121	11,769	11,769
Installed renewables - Rooftop PV (MW)	353	569	805	1,146	1,626	2,248	3,044
Installed renewables - Solar - Base land use assumptions (MW)	1,738	1,738	36,455	51,508	67,607	79,430	92,109
Installed renewables - Solar - Constrained land use assumptions (MW)	1,448	1,448	35,367	53,940	66,923	77,937	87,690
Installed renewables - Wind - Base land use assumptions (MW)	0	0	0	0	0	0	0
Installed renewables - Wind - Constrained land use assumptions (MW)	0	0	0	0	0	0	0

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	10.4	10.4
Biomass w/ccu power plant (GWh)	0	0	0	0	4,889	10,689	10,689
OffshoreWind - Base land use	0	0	0	0	7,713	42,161	42,161
assumptions (GWh)							
OffshoreWind - Constrained land use	0	0	0	0	7,713	42,161	42,161
assumptions (GWh)							
Solar - Base land use assumptions (GWh)	3,487	3,487	62,242	87,635	114,735	134,660	156,045
Solar - Constrained land use assumptions	2,906	2,906	60,261	91,569	113,397	132,008	148,392
(GWh)							
Wind - Base land use assumptions (GWh)	0	0	0	0	0	0	0
Wind - Constrained land use assumptions	0	0	0	0	0	0	0
(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	175	556	808
Conversion capital investment -		0	0	0	3,995	8,172	4,970
Cumulative 5-yr (million \$2018)							
Number of facilities - Allam power w ccu	0	0	0	0	0	1	1
(quantity)							
Number of facilities - Beccs hydrogen	0	0	0	0	0	4	9
(quantity)							
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	0	0	0	0	4	8	8
(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 9: E+ scenario - PILLAR 4: CCUS - CO2 capture

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

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

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

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

Item	2020	2025	2030	2035	2040	2045	2050
CO2 storage (MMT)		0	0	0	0	0	0
Injection wells (wells)		0	0	0	0	2	2
Resource characterization, appraisal, permitting costs (million \$2020)		3.29	7.9	10.5	10.5	10.5	10.5
Wells and facilities construction costs (million \$2020)		0	4.11	16	28.5	47.7	59.2

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

Table 12: E+ Scenario - PILLAR 6: Land Sink	ks - Agricu. 2020	<i>1ture</i> 2025	2030	2035	2040	2045	2050
Item Carbon sink potential - Aggressive	2020	2025	2030	2035	2040	2045	-81.8
							-81.8
deployment - Corn-ethanol to energy grasses (1000 tCO2e/y)							
Carbon sink potential - Aggressive							-1,291
deployment - Cropland measures (1000							-1,271
tCO2e/y)							
Carbon sink potential - Aggressive							-38.7
deployment - Permanent conservation							-50.1
cover (1000 tC02e/y)							
Carbon sink potential - Aggressive							-1,411
deployment - Total (1000 tC02e/y)							-1,411
Carbon sink potential - Moderate							-81.8
deployment - Corn-ethanol to energy							-01.0
grasses (1000 tC02e/y)							
Carbon sink potential - Moderate							-677
deployment - Cropland measures (1000							-011
tCO2e/y)							
Carbon sink potential - Moderate							-19.4
deployment - Permanent conservation							-17.4
cover (1000 tC02e/y)							
Carbon sink potential - Moderate							-778
deployment - Total (1000 tC02e/y)							-110
Land impacted for carbon sink -							46.8
Aggressive deployment - Corn-ethanol to							40.0
energy grasses (1000 hectares)							
Land impacted for carbon sink -							707
Aggressive deployment - Cropland							101
measures (1000 hectares)							
Land impacted for carbon sink -							70.4
Aggressive deployment - Permanent							10.4
conservation cover (1000 hectares)							
Land impacted for carbon sink -							824
Aggressive deployment - Total (1000							024
hectares)							
Land impacted for carbon sink - Moderate							46.8
deployment - Corn-ethanol to energy							40.0
grasses (1000 hectares)							
Land impacted for carbon sink - Moderate							371
deployment - Cropland measures (1000							011
hectares)							
Land impacted for carbon sink - Moderate							35.2
deployment - Permanent conservation							55.2
cover (1000 hectares)							
Land impacted for carbon sink - Moderate							453
deployment - Total (1000 hectares)							400
acployment - rotal (1000 nectal 68)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - High - Accelerate							-315
regeneration (1000 tC02e/y)							0 ( 070
Carbon sink potential - High - All (not							-36,273
counting overlap) (1000 tCO2e/y)							
Carbon sink potential - High - Avoid							-1,646
deforestation (1000 tCO2e/y)							
Carbon sink potential - High - Extend							-7,310
rotation length (1000 tCO2e/y)							
Carbon sink potential - High - Improve							-2,791
plantations (1000 tCO2e/y)							
Carbon sink potential - High - Increase							-17,707
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - High - Increase							-534
trees outside forests (1000 tCO2e/y)							
Carbon sink potential - High - Reforest							-813
cropland (1000 tCO2e/y)							
Carbon sink potential - High - Reforest							-2,422
pasture (1000 tC02e/y)							•
Carbon sink potential - High - Restore							-2,736
productivity (1000 tC02e/y)							_,
Carbon sink potential - Low - Accelerate							-158
regeneration (1000 tC02e/y)							100
Carbon sink potential - Low - All (not							-12,261
counting overlap) (1000 tC02e/y)							-12,201
Carbon sink potential - Low - Avoid							-274
deforestation (1000 tCO2e/y)							-214
Carbon sink potential - Low - Extend							-2,808
•							-2,808
rotation length (1000 tC02e/y)							1 / 00
Carbon sink potential - Low - Improve							-1,420
plantations (1000 tC02e/y)							F 0.00
Carbon sink potential - Low - Increase							-5,902
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - Low - Increase							-187
trees outside forests (1000 tCO2e/y)							
Carbon sink potential - Low - Reforest							-407
cropland (1000 tCO2e/y)							
Carbon sink potential - Low - Reforest							-183
pasture (1000 tCO2e/y)							
Carbon sink potential - Low - Restore							-922
productivity (1000 tCO2e/y)							
Carbon sink potential - Mid - Accelerate							-236
regeneration (1000 tCO2e/y)							
Carbon sink potential - Mid - All (not							-24,243
counting overlap) (1000 tCO2e/y)							
Carbon sink potential - Mid - Avoid							-960
deforestation (1000 tC02e/y)							
Carbon sink potential - Mid - Extend							-5,059
rotation length (1000 tC02e/y)							0,007
Carbon sink potential - Mid - Improve							-2,081
plantations (1000 tCO2e/y)							2,001
Carbon sink potential - Mid - Increase							-11,805
retention of HWP (1000 tCO2e/y)							-11,000
Carbon sink potential - Mid - Increase							-360
trees outside forests (1000 tCO2e/y)							-300
							-610
Carbon sink potential - Mid - Reforest							-610
cropland (1000 tC02e/y)							4 000
Carbon sink potential - Mid - Reforest							-1,303
pasture (1000 tC02e/y)							
Carbon sink potential - Mid - Restore							-1,829
productivity (1000 tCO2e/y)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Land impacted for carbon sink potential -							51.5
High - Accelerate regeneration (1000							
hectares)							
Land impacted for carbon sink potential -							223
High - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							3,727
High - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							1,028
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 -							50.7
High - Increase trees outside forests							
(1000 hectares)							
Land impacted for carbon sink potential -							53.8
High - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							68.8
High - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							907
High - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							6,110
High - Total impacted (over 30 years)							
(1000 hectares)							05.7
Land impacted for carbon sink potential -							25.7
Low - Accelerate regeneration (1000							
hectares)  Land impacted for carbon sink potential -							209
							209
Low - Avoid deforestation (over 30 years) (1000 hectares)							
Land impacted for carbon sink potential -		+					1,428
Low - Extend rotation length (1000							1,420
hectares)							
Land impacted for carbon sink potential -		+					514
Low - Improve plantations (1000							314
hectares)							
Land impacted for carbon sink potential -		+					0
Low - Increase retention of HWP (1000							Ū
hectares)							
Land impacted for carbon sink potential -							26.7
Low - Increase trees outside forests							
(1000 hectares)							
Land impacted for carbon sink potential -							26.9
Low - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							11.9
Low - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							549
Low - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							2,791
Low - Total impacted (over 30 years)							*
(1000 hectares)							
Land impacted for carbon sink potential -							38.6
Mid - Accelerate regeneration (1000							
hectares)		I .					

					_
Table 13: F+:	scenaria -	PTII AR 6.	I and sinks -	. Forests i	(continued)

Item	2020	2025	2030	2035	2040	2045	2050
Land impacted for carbon sink potential -							216
Mid - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							2,578
Mid - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							774
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 -							38.7
Mid - Increase trees outside forests (1000							
hectares)							
Land impacted for carbon sink potential -							40.3
Mid - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							86.2
Mid - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							1,105
Mid - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							4,876
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)		254	214	172	129	81.4	56.4
Natural gas consumption - Cumulative							5,174
(tcf)							
Natural gas production - Annual (tcf)		0	0	0	0	0	0
Oil consumption - Annual (million bbls)		97	83.4	63.6	45.3	30.8	19.7
Oil consumption - Cumulative (million							1,969
bbls)							
Oil production - Annual (million bbls)		0	0	0	0	0	0

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

Item	2020	2025	2030	2035	2040	2045	2050
Monetary damages from air pollution - Coal (million 2019\$)		269	0.437	0.407	0.323	0.225	0.019
Monetary damages from air pollution - Natural Gas (million 2019\$)		186	148	88.4	69.9	35	12.9
Monetary damages from air pollution - Transportation (million 2019\$)		1,041	979	750	437	201	79.7
Premature deaths from air pollution - Coal (deaths)		30.4	0.049	0.046	0.036	0.025	0.002
Premature deaths from air pollution - Natural Gas (deaths)		21	16.7	9.98	7.89	3.95	1.45
Premature deaths from air pollution - Transportation (deaths)		117	110	84.4	49.2	22.6	8.97

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

2020	2025	2030	2035	2040	2045	2050
	182	370	141	433	924	1,074
	5,030	30,329	22,797	26,148	29,404	31,012
	10,125	19,973	20,076	16,400	19,360	15,877
	1,727	1,235	795	478	270	148
	2020	182 5,030 10,125	182 370 5,030 30,329 10,125 19,973	182         370         141           5,030         30,329         22,797           10,125         19,973         20,076	182         370         141         433           5,030         30,329         22,797         26,148           10,125         19,973         20,076         16,400	182         370         141         433         924           5,030         30,329         22,797         26,148         29,404           10,125         19,973         20,076         16,400         19,360

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

Table 16: E+ scenario - IMPACTS - Jobs (co	intinueaj						
Item	2020	2025	2030	2035	2040	2045	2050
By economic sector - Other (jobs)		445	5,893	4,191	5,230	5,634	6,866
By economic sector - Pipeline (jobs)		367	312	360	238	227	224
By economic sector - Professional (jobs)		2,923	12,014	9,195	11,480	14,943	16,704
By economic sector - Trade (jobs)		2,036	8,034	6,165	7,568	9,281	10,722
By economic sector - Utilities (jobs)		7,557	14,745	16,841	19,130	23,760	22,906
By education level - All sectors -		9,440	29,656	25,934	28,119	33,445	33,958
Associates degree or some college (jobs)							
By education level - All sectors -		6,532	17,905	15,600	16,777	20,227	20,632
Bachelors degree (jobs)							
By education level - All sectors - Doctoral		191	631	496	574	709	770
degree (jobs)							
By education level - All sectors - High		12,743	40,456	34,878	37,574	44,457	44,997
school diploma or less (jobs)							
By education level - All sectors - Masters		1,486	4,255	3,653	4,062	4,965	5,175
or professional degree (jobs)				•			
By resource sector - Biomass (jobs)		782	1,020	403	1,304	3,370	4,585
By resource sector - CO2 (jobs)		1.58	3.49	961	497	937	1,235
By resource sector - Coal (jobs)		744	0	0	0	0	. 0
By resource sector - Grid (jobs)		7,712	22,626	27,709	34,046	44,991	44,340
By resource sector - Natural Gas (jobs)		3,626	3,404	2,868	2,985	2,134	1,133
By resource sector - Nuclear (jobs)		2,635	2,593	2,194	1,214	337	0.097
,						I .	
By resource sector - Oil (jobs)		4,311	3,403	2,397	1,583	1,006	605
By resource sector - Solar (jobs)		10,556	59,130	43,470	42,438	39,611	42,263
By resource sector - Wind (jobs)		26.2	724	559	3,039	11,417	11,371
Median wages - Annual - All (\$2019 per		55,437	53,264	54,500	55,316	56,410	57,209
job)							
On-Site or In-Plant Training - Total jobs - 1		4,840	15,219	13,252	14,384	17,066	17,302
to 4 years (jobs)							
On-Site or In-Plant Training - Total jobs - 4		1,751	6,178	5,244	5,909	7,005	7,237
to 10 years (jobs)							
On-Site or In-Plant Training - Total jobs -		4,995	15,411	13,194	14,222	16,920	17,258
None (jobs)		-				-	•
On-Site or In-Plant Training - Total jobs -		241	788	694	765	918	934
Over 10 years (jobs)							
On-Site or In-Plant Training - Total jobs -		18,566	55,308	48,178	51,825	61,895	62,801
Up to 1 year (jobs)		10,000	00,000	40,110	01,020	01,070	02,001
On-the-Job Training - All sectors - 1 to 4		6,189	19,537	17,015	18,509	21,968	22,279
years (jobs)		0,107	17,551	11,013	10,509	21,700	22,217
		1//0	/ 155	E 000	E 007	( 000	70/7
On-the-Job Training - All sectors - 4 to 10		1,660	6,155	5,203	5,907	6,992	7,247
years (jobs)		1.//0	F 100	/ 071	. 7. 0	5 500	
On-the-Job Training - All sectors - None		1,643	5,190	4,371	4,740	5,598	5,779
(jobs)							
On-the-Job Training - All sectors - Over 10		320	1,011	852	882	1,019	1,016
years (jobs)							
On-the-Job Training - All sectors - Up to 1		20,581	61,011	53,120	57,069	68,227	69,211
year (jobs)							
Related work experience - All sectors - 1		10,930	32,856	28,580	30,978	36,987	37,633
to 4 years (jobs)							
Related work experience - All sectors - 4		7,034	21,258	18,510	20,042	23,919	24,286
to 10 years (jobs)		,	,	- ,	-,	- /	,
Related work experience - All sectors -		4,293	13,394	11,637	12,688	15,118	15,432
None (jobs)		7,270	10,074	11,001	12,000	10,110	10,702
Related work experience - All sectors -		2,015	5,710	5,048	5,333	6,357	6,361
Over 10 years (jobs)		2,013	3,110	5,040	0,000	0,331	0,301
		/ 101	10 / 0/	1/ 705	10.075	01 / 00	01.000
Related work experience - All sectors - Up		6,121	19,686	16,785	18,065	21,422	21,820
to 1 year (jobs)		4.05	, 6, 6		, 610	5.057	
Wage income - All (million \$2019)		1,685	4,949	4,391	4,819	5,856	6,038

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

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

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

Item	2020	2025	2030	2035	2040	2045	2050
Electricity distribution capital invested -		2.92	2.93	3.93	4.05	5.12	5.35
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)	114	115	113	112	109	107	107
Final energy use - Industry (PJ)	358	374	381	391	402	403	407
Final energy use - Residential (PJ)	158	151	147	142	135	128	122
Final energy use - Transportation (PJ)	464	441	404	373	350	323	290

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

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

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

Item	2020	2025	2030	2035	2040	2045	2050
Light-duty vehicle capital costs -		0	138	291	982	3,094	4,506
Cumulative 5-yr (million \$2018)							
Public EV charging plugs - DC Fast (1000	0.1		0.496		2.66		7.45
units)							
Public EV charging plugs - L2 (1000 units)	0.476		11.9		63.9		179
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 (%)	1.48	1.91	2.04	1.62	1.03	0.528	0.226
Vehicle sales - Light-duty - EV (%)	1.98	4.89	12.3	26.5	49.1	72.5	87.8
Vehicle sales - Light-duty - gasoline (%)	91.5	87.1	79	65.8	45.4	24.4	10.8
Vehicle sales - Light-duty - hybrid (%)	4.86	5.65	6.32	5.71	4.24	2.48	1.19
Vehicle sales - Light-duty - hydrogen FC	0.112	0.378	0.321	0.244	0.172	0.095	0.044
(%)							
Vehicle sales - Light-duty - other (%)	0.1	0.103	0.093	0.081	0.058	0.032	0.015
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 deployment - Corn-ethanol to energy							-81.8
grasses (1000 tC02e/y)							
Carbon sink potential - Aggressive							-1,291
deployment - Cropland measures (1000							
tCO2e/y)							
Carbon sink potential - Aggressive							-38.7
deployment - Permanent conservation							
cover (1000 tC02e/y)							4 / 44
Carbon sink potential - Aggressive							-1,411
deployment - Total (1000 tC02e/y)  Carbon sink potential - Moderate							-81.8
deployment - Corn-ethanol to energy							-81.8
grasses (1000 tC02e/y)							
Carbon sink potential - Moderate							-677
deployment - Cropland measures (1000							011
tCO2e/y)							
Carbon sink potential - Moderate							-19.4
deployment - Permanent conservation							
cover (1000 tC02e/y)							
Carbon sink potential - Moderate							-778
deployment - Total (1000 tCO2e/y)							
Land impacted for carbon sink -							46.8
Aggressive deployment - Corn-ethanol to							
energy grasses (1000 hectares)							
Land impacted for carbon sink -							707
Aggressive deployment - Cropland							
measures (1000 hectares)							70./
Land impacted for carbon sink -							70.4
Aggressive deployment - Permanent conservation cover (1000 hectares)							
conservation cover (1000 nectares)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Land impacted for carbon sink -							824
Aggressive deployment - Total (1000							
hectares)							
Land impacted for carbon sink - Moderate							46.8
deployment - Corn-ethanol to energy							
grasses (1000 hectares)							
Land impacted for carbon sink - Moderate							371
deployment - Cropland measures (1000							
hectares)							
Land impacted for carbon sink - Moderate							35.2
deployment - Permanent conservation							
cover (1000 hectares)							
Land impacted for carbon sink - Moderate							453
deployment - Total (1000 hectares)							

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

2020	2025	2030	2035	2040	2045	2050
						-315
						-36,273
						-1,646
						-7,310
						-2,791
						-17,707
						-534
						-813
						-2,422
						•
						-2,736
						,
						-158
						-12,261
						, -
						-274
						-2,808
						,
						-1,420
						.,
						-5,902
						-,
						-187
						-407
						-183
						-922
						, , , ,
	+		+			-236
						-200
	2020	2020 2025	2020 2025 2030	2020 2025 2030 2035	2020 2025 2030 2035 2040	2020 2025 2030 2035 2040 2045

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

Item Carbon sink potential - Mid - All (not	2020	2025	2030	2035	2040	2045	2050 -24,243
counting overlap) (1000 tC02e/y)							-24,243
Carbon sink potential - Mid - Avoid							-960
deforestation (1000 tC02e/y)							-700
Carbon sink potential - Mid - Extend							-5,059
rotation length (1000 tCO2e/y)							-0,007
Carbon sink potential - Mid - Improve							-2,081
plantations (1000 tCO2e/y)							-2,001
Carbon sink potential - Mid - Increase							-11,805
retention of HWP (1000 tCO2e/y)							11,000
Carbon sink potential - Mid - Increase							-360
trees outside forests (1000 tC02e/y)							-300
Carbon sink potential - Mid - Reforest							-610
cropland (1000 tC02e/y)							-010
Carbon sink potential - Mid - Reforest							-1,303
·							-1,303
pasture (1000 tC02e/y)							1 000
Carbon sink potential - Mid - Restore							-1,829
productivity (1000 tC02e/y)							F1 F
Land impacted for carbon sink potential -							51.5
High - Accelerate regeneration (1000							
hectares)							200
Land impacted for carbon sink potential -							223
High - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							3,727
High - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							1,028
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 -							50.7
High - Increase trees outside forests							
(1000 hectares)							
Land impacted for carbon sink potential -							53.8
High - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							68.8
High - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							907
High - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							6,110
High - Total impacted (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							25.7
Low - Accelerate regeneration (1000							
hectares)							
Land impacted for carbon sink potential -							209
Low - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							1,428
Low - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							514
Low - Improve plantations (1000							
hectares)							
Land impacted for carbon sink potential -							0
Low - Increase retention of HWP (1000							_
hectares)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Land impacted for carbon sink potential -							26.
Low - Increase trees outside forests							
(1000 hectares)							
Land impacted for carbon sink potential -							26.9
Low - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							11.9
Low - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							549
Low - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							2,79
Low - Total impacted (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							38.6
Mid - Accelerate regeneration (1000							
hectares)							
Land impacted for carbon sink potential -							210
Mid - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							2,578
Mid - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							774
Mid - Improve plantations (1000 hectares)							
Land impacted for carbon sink potential -							(
Mid - Increase retention of HWP (1000							
hectares)							
Land impacted for carbon sink potential -							38.
Mid - Increase trees outside forests (1000							
hectares)							
Land impacted for carbon sink potential -							40.
Mid - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							86.5
Mid - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							1,10
Mid - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							4,87
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 - Coal (million 2019\$)		269	0.437	0.407	0.323	0.225	0.019
Monetary damages from air pollution - Natural Gas (million 2019\$)		176	116	46.3	17.4	5.7	3.02
Monetary damages from air pollution - Transportation (million 2019\$)		1,058	1,078	1,057	961	772	534
Premature deaths from air pollution - Coal (deaths)		30.4	0.049	0.046	0.036	0.025	0.002
Premature deaths from air pollution - Natural Gas (deaths)		19.9	13.1	5.23	1.96	0.644	0.341
Premature deaths from air pollution - Transportation (deaths)		119	121	119	108	86.8	60.1

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

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

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

Item	2020	2025	2030	2035	2040	2045	2050
Electricity distribution capital invested -		3.55	3.63	5.67	5.98	4.97	5.12
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)	114	114	111	106	101	100	102
Final energy use - Industry (PJ)	358	374	380	387	398	399	404
Final energy use - Residential (PJ)	158	150	141	129	119	115	113
Final energy use - Transportation (PJ)	463	438	386	323	267	233	218

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

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

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

Item	2020	2025	2030	2035	2040	2045	2050
Light-duty vehicle capital costs -		856	2,191	3,557	5,385	5,864	5,589
Cumulative 5-yr (million \$2018)							
Public EV charging plugs - DC Fast (1000	0.1		1.63		7.19		11.6
units)							
Public EV charging plugs - L2 (1000 units)	0.476		39.1		173		280
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 (%)	1.47	1.74	1.23	0.391	0.073	0.013	0
Vehicle sales - Light-duty - EV (%)	4.18	16	47.7	82.3	96.4	99.3	100
Vehicle sales - Light-duty - gasoline (%)	89.5	77.1	47.5	16	3.23	0.588	0
Vehicle sales - Light-duty - hybrid (%)	4.68	4.73	3.3	1.22	0.298	0.066	0
Vehicle sales - Light-duty - hydrogen FC	0.11	0.335	0.197	0.061	0.012	0.002	0
(%)							
Vehicle sales - Light-duty - other (%)	0.098	0.094	0.061	0.021	0.004	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 - Offshore Wind - Base		0	0	15	12.7	8.1	8.19
(billion \$2018)							
Capital invested - Solar PV - Base (billion		20.3	23.4	24	11.3	11.7	2.77
\$2018)							
Installed renewables - OffshoreWind -	0	0	0	7,318	14,654	20,148	26,685
Base land use assumptions (MW)							
Installed renewables - OffshoreWind -	0	0	0	16,465	32,595	32,595	56,657
Constrained land use assumptions (MW)							
Installed renewables - Solar - Base land	1,738	19,457	42,362	67,798	80,533	94,505	98,004
use assumptions (MW)							
Installed renewables - Solar -	3,476	35,831	83,598	133,706	156,476	177,468	186,311
Constrained land use assumptions (MW)							
Installed renewables - Wind - Base land	0	0	0	0	0	0	0
use assumptions (MW)							
Installed renewables - Wind - Constrained	0	0	0	0	0	0	0
land use assumptions (MW)							

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

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

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Aggressive							-81.8
deployment - Corn-ethanol to energy							
grasses (1000 tCO2e/y)							
Carbon sink potential - Aggressive							-1,291
deployment - Cropland measures (1000							
tCO2e/y)							
Carbon sink potential - Aggressive							-38.7
deployment - Permanent conservation							
cover (1000 tC02e/y)							
Carbon sink potential - Aggressive							-1,411
deployment - Total (1000 tC02e/y)							
Carbon sink potential - Moderate							-81.8
deployment - Corn-ethanol to energy							
grasses (1000 tCO2e/y)							
Carbon sink potential - Moderate							-677
deployment - Cropland measures (1000							
tCO2e/y)							
Carbon sink potential - Moderate							-19.4
deployment - Permanent conservation							
cover (1000 tCO2e/y)							
Carbon sink potential - Moderate							-778
deployment - Total (1000 tCO2e/y)							
Land impacted for carbon sink -							46.8
Aggressive deployment - Corn-ethanol to							
energy grasses (1000 hectares)							
Land impacted for carbon sink -							707
Aggressive deployment - Cropland							
measures (1000 hectares)							
Land impacted for carbon sink -							70.4
Aggressive deployment - Permanent							
conservation cover (1000 hectares)							
Land impacted for carbon sink -							824
Aggressive deployment - Total (1000							
hectares)							
Land impacted for carbon sink - Moderate							46.8
deployment - Corn-ethanol to energy							
grasses (1000 hectares)							
Land impacted for carbon sink - Moderate							371
deployment - Cropland measures (1000							
hectares)							
Land impacted for carbon sink - Moderate							35.2
deployment - Permanent conservation							00.2
cover (1000 hectares)							
Land impacted for carbon sink - Moderate							453
deployment - Total (1000 hectares)							-30
		I					

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - High - Accelerate							-315
regeneration (1000 tCO2e/y)							
Carbon sink potential - High - All (not							-36,273
counting overlap) (1000 tCO2e/y)							
Carbon sink potential - High - Avoid							-1,646
deforestation (1000 tCO2e/y)							
Carbon sink potential - High - Extend							-7,310
rotation length (1000 tCO2e/y)							
Carbon sink potential - High - Improve							-2,791
plantations (1000 tCO2e/y)							
Carbon sink potential - High - Increase							-17,707
retention of HWP (1000 tCO2e/y)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - High - Increase							-534
trees outside forests (1000 tCO2e/y)							
Carbon sink potential - High - Reforest cropland (1000 tCO2e/y)							-813
Carbon sink potential - High - Reforest pasture (1000 tC02e/y)							-2,422
Carbon sink potential - High - Restore							-2,736
productivity (1000 tCO2e/y) Carbon sink potential - Low - Accelerate							-158
regeneration (1000 tCO2e/y) Carbon sink potential - Low - All (not							-12,261
counting overlap) (1000 tC02e/y) Carbon sink potential - Low - Avoid							-274
deforestation (1000 tCO2e/y)							
Carbon sink potential - Low - Extend rotation length (1000 tCO2e/y)							-2,808
Carbon sink potential - Low - Improve							-1,420
plantations (1000 tCO2e/y)  Carbon sink potential - Low - Increase	+						-5,902
retention of HWP (1000 tC02e/y)							-3,702
Carbon sink potential - Low - Increase							-187
trees outside forests (1000 tC02e/y)							101
Carbon sink potential - Low - Reforest							-407
cropland (1000 tCO2e/y)							
Carbon sink potential - Low - Reforest							-183
pasture (1000 tC02e/y)							
Carbon sink potential - Low - Restore							-922
productivity (1000 tCO2e/y)							
Carbon sink potential - Mid - Accelerate regeneration (1000 tCO2e/y)							-236
Carbon sink potential - Mid - All (not							-24,243
counting overlap) (1000 tC02e/y)							2 1,2 10
Carbon sink potential - Mid - Avoid	+		+				-960
deforestation (1000 tCO2e/y)							
Carbon sink potential - Mid - Extend	+		+				-5,059
rotation length (1000 tCO2e/y)							0,007
Carbon sink potential - Mid - Improve							-2,081
plantations (1000 tCO2e/y)							,
Carbon sink potential - Mid - Increase							-11,805
retention of HWP (1000 tCO2e/y)							,
Carbon sink potential - Mid - Increase							-360
trees outside forests (1000 tC02e/y)							
Carbon sink potential - Mid - Reforest							-610
cropland (1000 tCO2e/y)							
Carbon sink potential - Mid - Reforest							-1,303
pasture (1000 tCO2e/y)							
Carbon sink potential - Mid - Restore							-1,829
productivity (1000 tCO2e/y)							
Land impacted for carbon sink potential -							51.5
High - Accelerate regeneration (1000							
hectares)							
Land impacted for carbon sink potential -							223
High - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							3,727
High - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							1,028
High - Improve plantations (1000							
hectares)							

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 - High - Increase retention of HWP (1000							0
hectares)							
Land impacted for carbon sink potential -							50.7
High - Increase trees outside forests							
(1000 hectares)							
Land impacted for carbon sink potential -							53.8
High - Reforest cropland (1000 hectares)							(0.0
Land impacted for carbon sink potential -							68.8
High - Reforest pasture (1000 hectares)							007
Land impacted for carbon sink potential -							907
High - Restore productivity (1000							
hectares) Land impacted for carbon sink potential -							6,110
High - Total impacted (over 30 years)							0,110
(1000 hectares)							
Land impacted for carbon sink potential -							25.7
Low - Accelerate regeneration (1000							20.1
hectares)							
Land impacted for carbon sink potential -							209
Low - Avoid deforestation (over 30 years)							207
(1000 hectares)							
Land impacted for carbon sink potential -							1,428
Low - Extend rotation length (1000							., .20
hectares)							
Land impacted for carbon sink potential -							514
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 -							26.7
Low - Increase trees outside forests							
(1000 hectares)							
Land impacted for carbon sink potential -							26.9
Low - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							11.9
Low - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							549
Low - Restore productivity (1000							
hectares)							0.701
Land impacted for carbon sink potential -							2,791
Low - Total impacted (over 30 years)							
(1000 hectares)  Land impacted for carbon sink potential -							38.6
Mid - Accelerate regeneration (1000							30.0
hectares)							
Land impacted for carbon sink potential -							216
Mid - Avoid deforestation (over 30 years)							210
(1000 hectares)							
Land impacted for carbon sink potential -							2,578
Mid - Extend rotation length (1000							2,010
hectares)							
Land impacted for carbon sink potential -							774
Mid - Improve plantations (1000 hectares)							
Land impacted for carbon sink potential -							0
Mid - Increase retention of HWP (1000							J
hectares)							
Land impacted for carbon sink potential -							38.7
Mid - Increase trees outside forests (1000							
hectares)	l l					1	

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Table 33: F+RF+ scenario -	PILLAR 6. Land sinks -	- Forests icontinuedi

Item	2020	2025	2030	2035	2040	2045	2050
Land impacted for carbon sink potential -							40.3
Mid - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							86.2
Mid - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							1,105
Mid - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							4,876
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 -		269	0.437	0.407	0.323	0.225	0.019
Coal (million 2019\$)							
Monetary damages from air pollution -		181	141	80.5	48.4	12.3	3.77
Natural Gas (million 2019\$)							
Monetary damages from air pollution -		1,041	979	750	437	201	79.7
Transportation (million 2019\$)							
Premature deaths from air pollution -		30.4	0.049	0.046	0.036	0.025	0.002
Coal (deaths)							
Premature deaths from air pollution -		20.4	16	9.08	5.46	1.39	0.425
Natural Gas (deaths)							
Premature deaths from air pollution -		117	110	84.4	49.2	22.6	8.97
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 - Cumulative 5-yr (million \$2018)		15,755	17,550				
Sales of cooking units - Electric Resistance (%)	32	46	79.9	86.5	86.9	86.9	86.9
Sales of cooking units - Gas (%)	68	54	20.1	13.5	13.1	13.1	13.1
Sales of space heating units - Electric Heat Pump (%)	10.1	27.5	70.6	83.9	85.2	85.2	85.2
Sales of space heating units - Electric Resistance (%)	9.29	8.33	10.3	12.4	12.9	12.8	12.8
Sales of space heating units - Fossil (%)	2.15	3.92	0.743	0.032	0	0	0
Sales of space heating units - Gas Furnace (%)	78.5	60.3	18.3	3.66	1.98	1.94	1.94
Sales of water heating units - Electric Heat Pump (%)	0.316	10.5	54.5	64.3	64.7	64.8	64.8
Sales of water heating units - Electric Resistance (%)	7.81	11	28.4	32.3	32.5	32.5	32.5
Sales of water heating units - Gas Furnace (%)	88	74.5	14.1	0.593	0	0	0
Sales of water heating units - Other (%)	3.86	4.03	2.99	2.74	2.74	2.73	2.73

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

Item	2020	2025	2030	2035	2040	2045	2050
Electricity distribution capital invested -		3.55	3.63	5.67	5.98	4.97	5.12
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)	114	114	111	106	101	100	102

Table 37: E+RE- scenario - PILLAR 1: Efficiency/Electrification - Overview (continued)

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

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

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

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

2020	2025	2030	2035	2040	2045	2050
	856	2,191	3,557	5,385	5,864	5,589
0.1		1.63		7.19		11.6
0.476		39.1		173		280
97.2	92.1	67	23.3	4.22	0.628	0
0.588	3.81	19	45.6	57.4	59.6	60
0.227	0.227	0.176	0.066	0.013	0.002	0
0.082	0.09	0.077	0.031	0.007	0.001	0
0.392	2.54	12.7	30.4	38.2	39.7	40
1.5	1.23	1.07	0.568	0.163	0.038	0
1.47	1.74	1.23	0.391	0.073	0.013	0
4.18	16	47.7	82.3	96.4	99.3	100
89.5	77.1	47.5	16	3.23	0.588	0
4.68	4.73	3.3	1.22	0.298	0.066	0
0.11	0.335	0.197	0.061	0.012	0.002	0
0.098	0.094	0.061	0.021	0.004	0.001	0
64.7	59.7	42.3	14.4	2.59	0.384	0
0.784	5.07	25.3	60.8	76.5	79.5	80
33.7	33.3	25.5	9.32	1.77	0.277	0
0.363	0.402	0.341	0.14	0.03	0.005	0
0.196	1.27	6.33	15.2	19.1	19.9	20
0.253	0.255	0.205	0.083	0.019	0.004	0
	0.1  0.476  97.2  0.588  0.227  0.082  0.392  1.5  1.47  4.18  89.5  4.68  0.11  0.098  64.7  0.784  33.7  0.363  0.196	0.1  0.476  97.2  92.1  0.588  3.81  0.227  0.082  0.09  0.392  2.54  1.5  1.23  1.47  1.74  4.18  16  89.5  77.1  4.68  4.73  0.11  0.335  0.098  0.094  64.7  59.7  0.784  5.07  33.7  33.3  0.363  0.402  0.196  1.27	0.1       1.63         0.476       39.1         97.2       92.1       67         0.588       3.81       19         0.227       0.227       0.176         0.082       0.09       0.077         0.392       2.54       12.7         1.5       1.23       1.07         1.47       1.74       1.23         4.18       16       47.7         89.5       77.1       47.5         4.68       4.73       3.3         0.11       0.335       0.197         0.098       0.094       0.061         64.7       59.7       42.3         0.784       5.07       25.3         33.7       33.3       25.5         0.363       0.402       0.341         0.196       1.27       6.33	0.1         1.63           0.476         39.1           97.2         92.1         67         23.3           0.588         3.81         19         45.6           0.227         0.227         0.176         0.066           0.082         0.09         0.077         0.031           0.392         2.54         12.7         30.4           1.5         1.23         1.07         0.568           1.47         1.74         1.23         0.391           4.18         16         47.7         82.3           89.5         77.1         47.5         16           4.68         4.73         3.3         1.22           0.11         0.335         0.197         0.061           0.098         0.094         0.061         0.021           64.7         59.7         42.3         14.4           0.784         5.07         25.3         60.8           33.7         33.3         25.5         9.32           0.363         0.402         0.341         0.14           0.196         1.27         6.33         15.2	856         2,191         3,557         5,385           0.1         1.63         7.19           0.476         39.1         173           97.2         92.1         67         23.3         4.22           0.588         3.81         19         45.6         57.4           0.227         0.227         0.176         0.066         0.013           0.082         0.09         0.077         0.031         0.007           0.392         2.54         12.7         30.4         38.2           1.5         1.23         1.07         0.568         0.163           1.47         1.74         1.23         0.391         0.073           4.18         16         47.7         82.3         96.4           89.5         77.1         47.5         16         3.23           4.68         4.73         3.3         1.22         0.298           0.11         0.335         0.197         0.061         0.012           0.098         0.094         0.061         0.021         0.004           64.7         59.7         42.3         14.4         2.59           0.784         5.07         25.3 <td>856         2,191         3,557         5,385         5,864           0.1         1.63         7.19           0.476         39.1         173           97.2         92.1         67         23.3         4.22         0.628           0.588         3.81         19         45.6         57.4         59.6           0.227         0.227         0.176         0.066         0.013         0.002           0.082         0.09         0.077         0.031         0.007         0.001           0.392         2.54         12.7         30.4         38.2         39.7           1.5         1.23         1.07         0.568         0.163         0.038           1.47         1.74         1.23         0.391         0.073         0.013           4.18         16         47.7         82.3         96.4         99.3           89.5         77.1         47.5         16         3.23         0.588           4.68         4.73         3.3         1.22         0.298         0.066           0.11         0.335         0.197         0.061         0.001         0.002         0.002           0.098         &lt;</td>	856         2,191         3,557         5,385         5,864           0.1         1.63         7.19           0.476         39.1         173           97.2         92.1         67         23.3         4.22         0.628           0.588         3.81         19         45.6         57.4         59.6           0.227         0.227         0.176         0.066         0.013         0.002           0.082         0.09         0.077         0.031         0.007         0.001           0.392         2.54         12.7         30.4         38.2         39.7           1.5         1.23         1.07         0.568         0.163         0.038           1.47         1.74         1.23         0.391         0.073         0.013           4.18         16         47.7         82.3         96.4         99.3           89.5         77.1         47.5         16         3.23         0.588           4.68         4.73         3.3         1.22         0.298         0.066           0.11         0.335         0.197         0.061         0.001         0.002         0.002           0.098         <

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		8.07	8.33	13.7	6.01	7.66	0.596
\$2018)							
Capital invested - Solar PV - Constrained		11.2	6.78	16.9	6.15	7.66	0.498
(billion \$2018)							
Installed renewables - OffshoreWind -	0	0	0	0	0	0	0
Base land use assumptions (MW)							
Installed renewables - OffshoreWind -	0	0	0	0	0	0	0
Constrained land use assumptions (MW)							
Installed renewables - Solar - Base land	1,738	8,792	16,937	31,472	38,244	47,390	48,144
use assumptions (MW)							
Installed renewables - Solar -	1,738	11,537	18,163	36,062	42,992	52,127	52,757
Constrained land use assumptions (MW)							
Installed renewables - Wind - Base land	0	0	0	0	0	0	0
use assumptions (MW)							
Installed renewables - Wind - Constrained	0	0	0	0	0	0	0
land use assumptions (MW)							

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

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

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Aggressive							-81.8
deployment - Corn-ethanol to energy							
grasses (1000 tCO2e/y)							
Carbon sink potential - Aggressive							-1,291
deployment - Cropland measures (1000							
tCO2e/y)							
Carbon sink potential - Aggressive							-38.7
deployment - Permanent conservation							
cover (1000 tCO2e/y)							
Carbon sink potential - Aggressive							-1,411
deployment - Total (1000 tCO2e/y)							
Carbon sink potential - Moderate							-81.8
deployment - Corn-ethanol to energy							
grasses (1000 tCO2e/y)							
Carbon sink potential - Moderate							-677
deployment - Cropland measures (1000							
tCO2e/y)							
Carbon sink potential - Moderate							-19.4
deployment - Permanent conservation							
cover (1000 tCO2e/y)							
Carbon sink potential - Moderate							-778
deployment - Total (1000 tCO2e/y)							
Land impacted for carbon sink -							46.8
Aggressive deployment - Corn-ethanol to							
energy grasses (1000 hectares)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Land impacted for carbon sink -							707
Aggressive deployment - Cropland							
measures (1000 hectares)							
Land impacted for carbon sink -							70.4
Aggressive deployment - Permanent							
conservation cover (1000 hectares)							
Land impacted for carbon sink -							824
Aggressive deployment - Total (1000							
hectares)							
Land impacted for carbon sink - Moderate							46.8
deployment - Corn-ethanol to energy							
grasses (1000 hectares)							
Land impacted for carbon sink - Moderate							371
deployment - Cropland measures (1000							
hectares)							
Land impacted for carbon sink - Moderate							35.2
deployment - Permanent conservation							
cover (1000 hectares)							
Land impacted for carbon sink - Moderate							453
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 regeneration (1000 tCO2e/y)							-315
Carbon sink potential - High - All (not							-36,273
counting overlap) (1000 tCO2e/y)							
Carbon sink potential - High - Avoid							-1,646
deforestation (1000 tCO2e/y)							
Carbon sink potential - High - Extend rotation length (1000 tCO2e/y)							-7,310
Carbon sink potential - High - Improve plantations (1000 tC02e/y)							-2,791
Carbon sink potential - High - Increase retention of HWP (1000 tCO2e/y)							-17,707
Carbon sink potential - High - Increase trees outside forests (1000 tCO2e/y)							-534
Carbon sink potential - High - Reforest cropland (1000 tCO2e/y)							-813
Carbon sink potential - High - Reforest pasture (1000 tC02e/y)							-2,422
Carbon sink potential - High - Restore productivity (1000 tC02e/y)							-2,736
Carbon sink potential - Low - Accelerate regeneration (1000 tCO2e/y)							-158
Carbon sink potential - Low - All (not counting overlap) (1000 tC02e/y)							-12,261
Carbon sink potential - Low - Avoid deforestation (1000 tC02e/y)							-274
Carbon sink potential - Low - Extend rotation length (1000 tC02e/y)							-2,808
Carbon sink potential - Low - Improve plantations (1000 tC02e/y)							-1,420
Carbon sink potential - Low - Increase retention of HWP (1000 tCO2e/y)							-5,902
Carbon sink potential - Low - Increase trees outside forests (1000 tC02e/y)							-187
Carbon sink potential - Low - Reforest cropland (1000 tCO2e/y)							-407

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

Conhon sink notantial Law Potanest	2020	2025	2030	2035	2040	2045	205 -18
Carbon sink potential - Low - Reforest							-18
pasture (1000 tC02e/y)							00
Carbon sink potential - Low - Restore							-92
productivity (1000 tC02e/y)							00
Carbon sink potential - Mid - Accelerate							-23
regeneration (1000 tC02e/y)							0/ 0/
Carbon sink potential - Mid - All (not							-24,24
counting overlap) (1000 tC02e/y)							0/
Carbon sink potential - Mid - Avoid							-96
deforestation (1000 tC02e/y)							
Carbon sink potential - Mid - Extend							-5,05
rotation length (1000 tCO2e/y)							
Carbon sink potential - Mid - Improve							-2,08
plantations (1000 tCO2e/y)							
Carbon sink potential - Mid - Increase							-11,80
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - Mid - Increase							-36
trees outside forests (1000 tCO2e/y)							
Carbon sink potential - Mid - Reforest							-61
cropland (1000 tCO2e/y)							
Carbon sink potential - Mid - Reforest							-1,30
pasture (1000 tC02e/y)							
Carbon sink potential - Mid - Restore							-1,82
productivity (1000 tCO2e/y)							.,
Land impacted for carbon sink potential -							51.
High - Accelerate regeneration (1000							0
hectares)							
Land impacted for carbon sink potential -							22
High - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							3,72
High - Extend rotation length (1000							0,12
hectares)							
Land impacted for carbon sink potential -							1,02
							1,02
High - Improve plantations (1000							
hectares)							
Land impacted for carbon sink potential -							
High - Increase retention of HWP (1000							
hectares)							
Land impacted for carbon sink potential -							50
High - Increase trees outside forests							
(1000 hectares)							
Land impacted for carbon sink potential -							53.
High - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -						T	68.
High - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							90
High - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							6,11
High - Total impacted (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							25
Low - Accelerate regeneration (1000							
hectares)							
Land impacted for carbon sink potential -							20
Low - Avoid deforestation (over 30 years)							_0
(1000 hectares)							
Land impacted for carbon sink potential -							1,42
Low - Extend rotation length (1000							1,42
hectares)							

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 -							514
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 -							26.7
Low - Increase trees outside forests							
(1000 hectares)							
Land impacted for carbon sink potential -							26.9
Low - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							11.9
Low - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							549
Low - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							2,791
Low - Total impacted (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							38.6
Mid - Accelerate regeneration (1000							
hectares)							
Land impacted for carbon sink potential -							216
Mid - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							2,578
Mid - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							774
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 -							38.7
Mid - Increase trees outside forests (1000							
hectares)							
Land impacted for carbon sink potential -							40.3
Mid - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							86.2
Mid - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							1,105
Mid - Restore productivity (1000							,
hectares)							
Land impacted for carbon sink potential -							4,876
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 -		269	0.437	0.407	0.323	0.225	0.019
Coal (million 2019\$)							
Monetary damages from air pollution -		202	168	161	123	39.9	12.9
Natural Gas (million 2019\$)							
Monetary damages from air pollution -		1,041	979	750	437	201	79.7
Transportation (million 2019\$)							
Premature deaths from air pollution -		30.4	0.049	0.046	0.036	0.025	0.002
Coal (deaths)							
Premature deaths from air pollution -		22.8	18.9	18.1	13.9	4.5	1.45
Natural Gas (deaths)							
Premature deaths from air pollution -		117	110	84.4	49.2	22.6	8.97
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 - Cumulative 5-yr (million \$2018)		15,746	17,554				
Sales of cooking units - Electric Resistance (%)	32	36.2	40.9	53.4	71	81.7	85.5
Sales of cooking units - Gas (%)	68	63.8	59.1	46.6	29	18.3	14.5
Sales of space heating units - Electric Heat Pump (%)	10.1	19.3	24.3	38.5	60.9	76.8	82.9
Sales of space heating units - Electric Resistance (%)	9.29	8.02	8.23	8.98	10.4	11.8	12.5
Sales of space heating units - Fossil (%)	2.15	4.53	4.19	3.17	1.56	0.496	0.13
Sales of space heating units - Gas Furnace (%)	78.5	68.1	63.3	49.4	27.1	10.9	4.44
Sales of water heating units - Electric Heat Pump (%)	0.316	2.04	7.05	21.5	43.6	58	63
Sales of water heating units - Electric Resistance (%)	7.81	7.62	9.51	15.3	24.1	29.8	31.8
Sales of water heating units - Gas Furnace (%)	88	86.1	79.2	59.5	29.1	9.29	2.42
Sales of water heating units - Other (%)	3.86	4.23	4.21	3.8	3.27	2.9	2.77

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

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

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

14210 111 = 2 1 000114110 11 ==== 1111010									
Item	2020	2025	2030	2035	2040	2045	2050		
Final energy use - Commercial (PJ)	114	115	113	112	109	107	107		
Final energy use - Industry (PJ)	358	374	381	391	402	403	407		
Final energy use - Residential (PJ)	158	151	147	142	135	128	122		
Final energy use - Transportation (PJ)	464	441	404	373	350	323	290		

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

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

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

Item	2020	2025	2030	2035	2040	2045	2050
Light-duty vehicle capital costs -		0	138	291	982	3,094	4,506
Cumulative 5-yr (million \$2018)							
Public EV charging plugs - DC Fast (1000	0.1		0.496		2.66		7.45
units)							
Public EV charging plugs - L2 (1000 units)	0.476		11.9		63.9		179
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 (%)	1.48	1.91	2.04	1.62	1.03	0.528	0.226
Vehicle sales - Light-duty - EV (%)	1.98	4.89	12.3	26.5	49.1	72.5	87.8
Vehicle sales - Light-duty - gasoline (%)	91.5	87.1	79	65.8	45.4	24.4	10.8
Vehicle sales - Light-duty - hybrid (%)	4.86	5.65	6.32	5.71	4.24	2.48	1.19
Vehicle sales - Light-duty - hydrogen FC	0.112	0.378	0.321	0.244	0.172	0.095	0.044
(%)							
Vehicle sales - Light-duty - other (%)	0.1	0.103	0.093	0.081	0.058	0.032	0.015
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	0.008	0	0.047
Capital invested - Biomass w/ccu power plant (billion \$2018)	0	0	0	0	7.26	0	0

#### 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	7.93	7.93	55.2
Biomass w/ccu power plant (GWh)	0	0	0	0	8,149	8,149	8,149

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

Item	2020	2025	2030	2035	2040	2045	2050
	2020	2025	2030	2033			
Biomass purchases (million \$2018/year)		0	0	0	463	822	1,376
Conversion capital investment -		0	0	0	6,674	4,475	6,984
Cumulative 5-yr (million \$2018)							
Number of facilities - Allam power w ccu	0	0	0	0	1	1	2
(quantity)							
Number of facilities - Beccs hydrogen	0	0	0	0	0	5	12
(quantity)							
Number of facilities - Diesel (quantity)	0	0	0	0	0	0	0
Number of facilities - Diesel ccu (quantity)	0	0	0	0	1	1	2
Number of facilities - Power (quantity)	0	0	0	0	0	0	0
Number of facilities - Power ccu	0	0	0	0	7	7	7
(quantity)							
Number of facilities - Pyrolysis (quantity)	0	0	0	0	0	0	0

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

Item	2020	2025	2030	2035	2040	2045	2050
Number of facilities - Pyrolysis ccu	0	0	0	0	0	0	1
(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	0	11.4	17.2	27
Annual - BECCS (MMT)		0	0	0	8.07	13.8	23.5
Annual - Cement and lime (MMT)		0	0	0	3.32	3.42	3.53
Annual - NGCC (MMT)		0	0	0	0	0	0
Cumulative - All (MMT)		0	0	0	11.4	28.6	55.6
Cumulative - BECCS (MMT)		0	0	0	8.07	21.9	45.4
Cumulative - Cement and lime (MMT)		0	0	0	3.32	6.74	10.3
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	159	932	1,177	1,649
Cumulative investment - All (million \$2018)		0	0	951	1,943	2,149	2,706
Cumulative investment - Spur (million \$2018)		0	0	0	993	1,199	1,755
Cumulative investment - Trunk (million \$2018)		0	0	951	951	951	951
Spur (km)		0	0	0	773	1,018	1,489
Trunk (km)		0	0	159	159	159	159

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

Item	2020	2025	2030	2035	2040	2045	2050
CO2 storage (MMT)		0	0	0	0	0	0
Injection wells (wells)		0	0	0	0	2	2
Resource characterization, appraisal, permitting costs (million \$2020)		3.29	7.9	10.5	10.5	10.5	10.5
Wells and facilities construction costs (million \$2020)		0	4.11	16	28.5	47.7	59.2

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Aggressive							-218
deployment - Corn-ethanol to energy							
grasses (1000 tCO2e/y)							
Carbon sink potential - Aggressive							-1,143
deployment - Cropland measures (1000							
tCO2e/y)							
Carbon sink potential - Aggressive							0
deployment - Cropland to woody energy							
crops (1000 tCO2e/y)							
Carbon sink potential - Aggressive							0
deployment - Pasture to energy crops							
(1000 tCO2e/y)							
Carbon sink potential - Aggressive							-33.8
deployment - Permanent conservation							
cover (1000 tCO2e/y)							
Carbon sink potential - Aggressive							-1,395
deployment - Total (1000 tCO2e/y)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Moderate							-218
deployment - Corn-ethanol to energy							
grasses (1000 tCO2e/y)							
Carbon sink potential - Moderate							-60
deployment - Cropland measures (1000							
tCO2e/y)							
Carbon sink potential - Moderate							(
deployment - Cropland to woody energy							
crops (1000 tC02e/y)							
Carbon sink potential - Moderate							
deployment - Pasture to energy crops							
(1000 tC02e/y)							
Carbon sink potential - Moderate							-16.
deployment - Permanent conservation							
cover (1000 tCO2e/y)							
Carbon sink potential - Moderate							-83
deployment - Total (1000 tCO2e/y)							-00
and impacted for carbon sink -							13
							13
Aggressive deployment - Corn-ethanol to							
energy grasses (1000 hectares)							1 - 7
and impacted for carbon sink -							1,54
Aggressive deployment - Cropland							
neasures (1000 hectares)							
and impacted for carbon sink -							45
Aggressive deployment - Cropland to							
woody energy crops (1000 hectares)							
Land impacted for carbon sink -							85.
Aggressive deployment - Pasture to							
energy crops (1000 hectares)							
and impacted for carbon sink -							61.
Aggressive deployment - Permanent							
conservation cover (1000 hectares)							
and impacted for carbon sink -							1,87
Aggressive deployment - Total (1000							
nectares)							
and impacted for carbon sink - Moderate							13
deployment - Corn-ethanol to energy							
grasses (1000 hectares)							
and impacted for carbon sink - Moderate		+					32
deployment - Cropland measures (1000							02
nectares)							
and impacted for carbon sink - Moderate							45
deployment - Cropland to woody energy							40
crops (1000 hectares)							0.5
and impacted for carbon sink - Moderate							85.
deployment - Pasture to energy crops							
1000 hectares)							
and impacted for carbon sink - Moderate							30
deployment - Permanent conservation							
cover (1000 hectares)							
Land impacted for carbon sink - Moderate							62
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 regeneration (1000 tCO2e/y)							-315
Carbon sink potential - High - All (not counting overlap) (1000 tC02e/y)							-36,273
Carbon sink potential - High - Avoid deforestation (1000 tCO2e/y)							-1,646

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - High - Extend							-7,310
rotation length (1000 tC02e/y)							0.704
Carbon sink potential - High - Improve							-2,791
plantations (1000 tC02e/y)							
Carbon sink potential - High - Increase							-17,707
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - High - Increase							-534
trees outside forests (1000 tCO2e/y)							
Carbon sink potential - High - Reforest							-813
cropland (1000 tCO2e/y)							
Carbon sink potential - High - Reforest							-2,422
pasture (1000 tCO2e/y)							
Carbon sink potential - High - Restore							-2,736
productivity (1000 tCO2e/y)							
Carbon sink potential - Low - Accelerate							-158
regeneration (1000 tCO2e/y)							
Carbon sink potential - Low - All (not							-12,261
counting overlap) (1000 tC02e/y)							
Carbon sink potential - Low - Avoid							-274
deforestation (1000 tCO2e/y)							
Carbon sink potential - Low - Extend							-2,808
rotation length (1000 tC02e/y)							_,000
Carbon sink potential - Low - Improve							-1,420
plantations (1000 tCO2e/y)							1,420
Carbon sink potential - Low - Increase							-5,902
retention of HWP (1000 tCO2e/y)							-5,702
Carbon sink potential - Low - Increase		-					-187
trees outside forests (1000 tC02e/y)							-101
							-407
Carbon sink potential - Low - Reforest							-407
cropland (1000 tC02e/y)							400
Carbon sink potential - Low - Reforest							-183
pasture (1000 tC02e/y)							
Carbon sink potential - Low - Restore							-922
productivity (1000 tCO2e/y)							
Carbon sink potential - Mid - Accelerate							-236
regeneration (1000 tCO2e/y)							
Carbon sink potential - Mid - All (not							-24,243
counting overlap) (1000 tCO2e/y)							
Carbon sink potential - Mid - Avoid							-960
deforestation (1000 tCO2e/y)							
Carbon sink potential - Mid - Extend							-5,059
rotation length (1000 tCO2e/y)							
Carbon sink potential - Mid - Improve							-2,081
plantations (1000 tCO2e/y)							
Carbon sink potential - Mid - Increase							-11,805
retention of HWP (1000 tCO2e/y)							,
Carbon sink potential - Mid - Increase							-360
trees outside forests (1000 tC02e/y)							000
Carbon sink potential - Mid - Reforest							-610
cropland (1000 tCO2e/y)							010
Carbon sink potential - Mid - Reforest							-1,303
pasture (1000 tC02e/y)							-1,000
Carbon sink potential - Mid - Restore							-1,829
							-1,029
productivity (1000 tC02e/y)							F4 F
Land impacted for carbon sink potential -							51.5
High - Accelerate regeneration (1000							
hectares)							
Land impacted for carbon sink potential -							223
High - Avoid deforestation (over 30 years)							

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 -	2020	2025	2030	2035	2040	2045	3,727
High - Extend rotation length (1000							3,121
hectares)							
Land impacted for carbon sink potential -							1,028
High - Improve plantations (1000							1,020
hectares)							
Land impacted for carbon sink potential -							0
							U
High - Increase retention of HWP (1000							
hectares)							E0.7
Land impacted for carbon sink potential -							50.7
High - Increase trees outside forests							
(1000 hectares)							F0 0
Land impacted for carbon sink potential -							53.8
High - Reforest cropland (1000 hectares)							(0.0
Land impacted for carbon sink potential -							68.8
High - Reforest pasture (1000 hectares)							007
Land impacted for carbon sink potential -							907
High - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							6,110
High - Total impacted (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							25.7
Low - Accelerate regeneration (1000							
hectares)							
Land impacted for carbon sink potential -							209
Low - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							1,428
Low - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							514
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 -							26.7
Low - Increase trees outside forests							
(1000 hectares)							
Land impacted for carbon sink potential -							26.9
Low - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							11.9
Low - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							549
Low - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							2,791
Low - Total impacted (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							38.6
Mid - Accelerate regeneration (1000							
hectares)							
Land impacted for carbon sink potential -							216
Mid - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -			+				2,578
Mid - Extend rotation length (1000							,
hectares)							
Land impacted for carbon sink potential -			+				774
Mid - Improve plantations (1000 hectares)							
	1	1					

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
Mid - Increase retention of HWP (1000							
hectares)							
Land impacted for carbon sink potential -							38.7
Mid - Increase trees outside forests (1000							
hectares)							
Land impacted for carbon sink potential -							40.3
Mid - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							86.2
Mid - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							1,105
Mid - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							4,876
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 -		269	0.437	0.407	0.323	0.225	0.019
Coal (million 2019\$)							
Monetary damages from air pollution -		193	127	61.5	37.8	19.9	8.22
Natural Gas (million 2019\$)							
Monetary damages from air pollution -		1,058	1,078	1,057	961	772	534
Transportation (million 2019\$)							
Premature deaths from air pollution -		30.4	0.049	0.046	0.036	0.025	0.002
Coal (deaths)							
Premature deaths from air pollution -		21.8	14.4	6.94	4.27	2.24	0.928
Natural Gas (deaths)							
Premature deaths from air pollution -		119	121	119	108	86.8	60.1
Transportation (deaths)							

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

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

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

Item	2020	2025	2030	2035	2040	2045	2050
Electricity distribution capital invested -		3.94	4.06	5.79	6.1	5.26	5.44
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)	114	116	117	119	121	125	132
Final energy use - Industry (PJ)	358	383	402	413	428	438	452
Final energy use - Residential (PJ)	158	152	151	152	156	160	165
Final energy use - Transportation (PJ)	463	441	406	385	385	396	410

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

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

#### 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 (%)	1.47	1.9	2.17	2.02	1.82	1.69	1.61
Vehicle sales - Light-duty - EV (%)	3.82	5.94	6.74	8.31	10.1	11.6	12.8
Vehicle sales - Light-duty - gasoline (%)	89.8	86.2	83.9	82	79.8	77.9	76.4
Vehicle sales - Light-duty - hybrid (%)	4.7	5.53	6.75	7.31	7.86	8.4	8.8
Vehicle sales - Light-duty - hydrogen FC (%)	0.11	0.374	0.341	0.302	0.298	0.298	0.309
Vehicle sales - Light-duty - other (%)	0.098	0.102	0.099	0.099	0.098	0.097	0.099
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

Carbon sink potential - High - Accelerate repeneration (1000 C022e/v)   3-36,273	Item	2020	2025	2030	2035	2040	2045	2050
regeneration (1000 tC02e/y)   -36,273   -36,		2020	2023	2000	2000	2040	2043	
Garbon sink potential - High - All (not counting overlap) (1000 (CO2e/y)								0.0
Carbon sink potential - High - Reforest   Carbon sink potential - High - Improve   Carbon sink potential - High - Reforest   Carbon sink potential - Low - Accelerate regeneration (1000 tCO2e/v)   Carbon sink potential - Low - Accelerate   Carbon sink potential - Low - Accelerate   Carbon sink potential - Low - Awold deforestation (1000 tCO2e/v)   Carbon sink potential - Low - Awold deforestation (1000 tCO2e/v)   Carbon sink potential - Low - Extend   Carbon sink potential - Low - Extend   Carbon sink potential - Low - Improve   Carbon sink potential - Low - Impro	= *							-36,273
deforestation (1000 tCOZe/y)   Carbon sink potential - High - Extend   7,310   Carbon sink potential - High - Extend   7,310   Carbon sink potential - High - Improve plantations (1000 tCOZe/y)   Carbon sink potential - High - Increase retention of HWP (1000 tCOZe/y)   Carbon sink potential - High - Increase retention of HWP (1000 tCOZe/y)   Carbon sink potential - High - Increase rese outside forests (1000 tCOZe/y)   7,330   Carbon sink potential - High - Reforest cropland (1000 tCOZe/y)   7,330   Carbon sink potential - High - Reforest cropland (1000 tCOZe/y)   7,330   Carbon sink potential - High - Restore productivity (1000 tCOZe/y)   7,330   Carbon sink potential - High - Restore productivity (1000 tCOZe/y)   7,330   Carbon sink potential - Low - Accelerate regeneration (1000 tCOZe/y)   7,330   Carbon sink potential - Low - Accelerate regeneration (1000 tCOZe/y)   7,330   Carbon sink potential - Low - All (not counting overlap) (1000 tCOZe/y)   7,330   Carbon sink potential - Low - All (not counting overlap) (1000 tCOZe/y)   7,330   Carbon sink potential - Low - All (not counting overlap) (1000 tCOZe/y)   7,330   Carbon sink potential - Low - Avoid deforestation (1000 tCOZe/y)   7,330   Carbon sink potential - Low - Extend rotation length (1000 tCOZe/y)   7,330   Carbon sink potential - Low - Extend rotation length (1000 tCOZe/y)   7,330   Carbon sink potential - Low - Improve plantations (1000 tCOZe/y)   7,330   Carbon sink potential - Low - Improve plantations (1000 tCOZe/y)   7,330   Carbon sink potential - Low - Improve plantations (1000 tCOZe/y)   7,330   Carbon sink potential - Low - Reforest resease treatend on HWP (1000 tCOZe/y)   7,330   Carbon sink potential - Low - Reforest resease treatend on HWP (1000 tCOZe/y)   7,330   Carbon sink potential - Low - Reforest regeneration (1000 tCOZe/y)   7,330   Carbon sink potential - Mid - Accelerate regeneration (1000 tCOZe/y)   7,330   Carbon sink potential - Mid - Reforest regeneration (1000 tCOZe/y)   7,330   Carbon sink potential - Mid - Reforest regen								•
deforestation (1000 tCOZe/y)   Carbon sink potential - High - Extend   7,310   Carbon sink potential - High - Extend   7,310   Carbon sink potential - High - Improve plantations (1000 tCOZe/y)   Carbon sink potential - High - Increase retention of HWP (1000 tCOZe/y)   Carbon sink potential - High - Increase retention of HWP (1000 tCOZe/y)   Carbon sink potential - High - Increase rese outside forests (1000 tCOZe/y)   7,330   Carbon sink potential - High - Reforest cropland (1000 tCOZe/y)   7,330   Carbon sink potential - High - Reforest cropland (1000 tCOZe/y)   7,330   Carbon sink potential - High - Restore productivity (1000 tCOZe/y)   7,330   Carbon sink potential - High - Restore productivity (1000 tCOZe/y)   7,330   Carbon sink potential - Low - Accelerate regeneration (1000 tCOZe/y)   7,330   Carbon sink potential - Low - Accelerate regeneration (1000 tCOZe/y)   7,330   Carbon sink potential - Low - All (not counting overlap) (1000 tCOZe/y)   7,330   Carbon sink potential - Low - All (not counting overlap) (1000 tCOZe/y)   7,330   Carbon sink potential - Low - All (not counting overlap) (1000 tCOZe/y)   7,330   Carbon sink potential - Low - Avoid deforestation (1000 tCOZe/y)   7,330   Carbon sink potential - Low - Extend rotation length (1000 tCOZe/y)   7,330   Carbon sink potential - Low - Extend rotation length (1000 tCOZe/y)   7,330   Carbon sink potential - Low - Improve plantations (1000 tCOZe/y)   7,330   Carbon sink potential - Low - Improve plantations (1000 tCOZe/y)   7,330   Carbon sink potential - Low - Improve plantations (1000 tCOZe/y)   7,330   Carbon sink potential - Low - Reforest resease treatend on HWP (1000 tCOZe/y)   7,330   Carbon sink potential - Low - Reforest resease treatend on HWP (1000 tCOZe/y)   7,330   Carbon sink potential - Low - Reforest regeneration (1000 tCOZe/y)   7,330   Carbon sink potential - Mid - Accelerate regeneration (1000 tCOZe/y)   7,330   Carbon sink potential - Mid - Reforest regeneration (1000 tCOZe/y)   7,330   Carbon sink potential - Mid - Reforest regen								-1,646
totation length [1000 tC02e/v]   Carbon sink potential + ligh - Improve plantations (1000 tC02e/v)   Carbon sink potential - ligh - Increase retention of HWP (1000 tC02e/v)   Carbon sink potential - High - Increase trees outside forests (1000 tC02e/v)   Carbon sink potential - High - Reforest cropland (1000 tC02e/v)   Carbon sink potential - High - Reforest cropland (1000 tC02e/v)   Carbon sink potential - High - Reforest cropland (1000 tC02e/v)   Carbon sink potential - High - Restore productivity (1000 tC02e/v)   Carbon sink potential - High - Restore productivity (1000 tC02e/v)   Carbon sink potential - Low - Accelerate regeneration (1000 tC02e/v)   Carbon sink potential - Low - Accelerate regeneration (1000 tC02e/v)   Carbon sink potential - Low - Accelerate regeneration (1000 tC02e/v)   Carbon sink potential - Low - All (Inot counting overlap) (1000 tC02e/v)   Carbon sink potential - Low - Avoid deforestation (1000 tC02e/v)   Carbon sink potential - Low - Avoid deforestation (1000 tC02e/v)   Carbon sink potential - Low - Extend rotation length (1000 tC02e/v)   Carbon sink potential - Low - Extend rotation length (1000 tC02e/v)   Carbon sink potential - Low - Extend rotation length (1000 tC02e/v)   Carbon sink potential - Low - Improve plantations (1000 tC02e/v)   Carbon sink potential - Low - Improve plantations (1000 tC02e/v)   Carbon sink potential - Low - Reforest carbon sink potential - Low - Reforest couls deforests (1000 tC02e/v)   Carbon sink potential - Low - Reforest couls deforest (1000 tC02e/v)   Carbon sink potential - Low - Reforest carbon sink potential - Low - Reforest postulated (1000 tC02e/v)   Carbon sink potential - Low - Reforest carbon sink potential - Mid - Accelerate regeneration (1000 tC02e/v)   Carbon sink potential - Mid - Restore   Carbon sink potential - Mid - Restorest   Carbon sink potential - Mid - Restorest   Carbon sink potential - Mid - Restorest   Carb								
Carbon sink potential - High - Improve   14,707   17,70	Carbon sink potential - High - Extend							-7,310
plantations (1000 tC02e/v)   Carbon sink potential - High - Increase retention of HWP (1000 tC02e/v)   For the state of	rotation length (1000 tCO2e/y)							
17,707	Carbon sink potential - High - Improve							-2,791
Petention of HWP (1000 C02e/y)   Carbon sink potential - High - Increase trees outside forests (1000 C02e/y)   Carbon sink potential - High - Reforest tropland (1000 C02e/y)   Carbon sink potential - High - Reforest tropland (1000 C02e/y)   Carbon sink potential - High - Reforest pasture (1000 C02e/y)   Carbon sink potential - High - Restore productivity (1000 C02e/y)   Carbon sink potential - Low - Accelerate regeneration (1000 C02e/y)   Carbon sink potential - Low - Accelerate regeneration (1000 C02e/y)   Carbon sink potential - Low - All (not counting overlap) (1000 C02e/y)   Carbon sink potential - Low - Accelerate regeneration (1000 C02e/y)   Carbon sink potential - Low - All (not counting overlap) (1000 C02e/y)   Carbon sink potential - Low - Extend (2.808 counting overlap) (1000 C02e/y)   Carbon sink potential - Low - Extend (2.808 counting overlap) (1000 C02e/y)   Carbon sink potential - Low - Improve plantations (1000 C02e/y)   Carbon sink potential - Low - Improve plantations (1000 C02e/y)   Carbon sink potential - Low - Improve plantations (1000 C02e/y)   Carbon sink potential - Low - Reforest regeneration of HWP (1000 C02e/y)   Carbon sink potential - Low - Reforest counting overlap (1000 C02e/y)   Carbon sink potential - Low - Reforest counting overlap (1000 C02e/y)   Carbon sink potential - Low - Reforest counting overlap (1000 C02e/y)   Carbon sink potential - Low - Reforest counting overlap (1000 C02e/y)   Carbon sink potential - Low - Reforest counting overlap (1000 C02e/y)   Carbon sink potential - Low - Reforest counting overlap (1000 C02e/y)   Carbon sink potential - Low - Reforest counting overlap (1000 C02e/y)   Carbon sink potential - Mid - Audid do Garbon sink potential - Mid - Audid do Garbon sink potential - Mid - Reforest counting overlap (1000 C02e/y)   Carbon sink potential - Mid - Reforest counting overlap (1000 C02e/y)   Carbon sink potential - Mid - Reforest counting overlap (1000 C02e/y)   Carbon sink potential - Mid - Reforest counting overlap (1000 C02e/y)   Carbon sink pote								
Carbon sink potential - High - Increase   Fast	Carbon sink potential - High - Increase							-17,707
Trees outside forests (1000 tC02e/v)   Carbon sink potential - High - Reforest   -2,422   -2,422   -2,422   -2,422   -2,422   -2,422   -2,422   -2,422   -2,422   -2,422   -2,422   -2,423   -2,422   -2,423   -								
Carbon sink potential - High - Reforest   -813   -2,422								-534
Carbon sink potential - High - Reforest   -2,422   pasture (1000 tC02e/v)   -2,736								
Carbon sink potential - High - Reforest pasture (1000 tC02e/y)   Carbon sink potential - High - Restore productivity (1000 tC02e/y)   Carbon sink potential - Low - Accelerate regeneration (1000 tC02e/y)   Carbon sink potential - Low - Accelerate regeneration (1000 tC02e/y)   Carbon sink potential - Low - All (not counting overlap) (1000 tC02e/y)   Carbon sink potential - Low - Avoid deforestation (1000 tC02e/y)   Carbon sink potential - Low - Extend rotation length (1000 tC02e/y)   Carbon sink potential - Low - Extend rotation length (1000 tC02e/y)   Carbon sink potential - Low - Improve plantations (1000 tC02e/y)   Carbon sink potential - Low - Increase retention of HWP (1000 tC02e/y)   Carbon sink potential - Low - Increase retention of HWP (1000 tC02e/y)   Carbon sink potential - Low - Reforest pasture (1000 tC02e/y)   Carbon sink potential - Low - Reforest pasture (1000 tC02e/y)   Carbon sink potential - Low - Reforest pasture (1000 tC02e/y)   Carbon sink potential - Low - Reforest pasture (1000 tC02e/y)   Carbon sink potential - Low - Reforest pasture (1000 tC02e/y)   Carbon sink potential - Mow - Restore productivity (1000 tC02e/y)   Carbon sink potential - Mid - Accelerate regeneration (1000 tC02e/y)   Carbon sink potential - Mid - Accelerate regeneration (1000 tC02e/y)   Carbon sink potential - Mid - Accelerate regeneration (1000 tC02e/y)   Carbon sink potential - Mid - Accelerate regeneration (1000 tC02e/y)   Carbon sink potential - Mid - Acvoid deforestation (1000 tC02e/y)   Carbon sink potential - Mid - Acvoid deforestation (1000 tC02e/y)   Carbon sink potential - Mid - Acvoid deforestation (1000 tC02e/y)   Carbon sink potential - Mid - Reforest retention of HWP (1000 tC02e/y)   Carbon sink potential - Mid - Reforest retention of HWP (1000 tC02e/y)   Carbon sink potential - Mid - Reforest retention of HWP (1000 tC02e/y)   Carbon sink potential - Mid - Reforest retention of HWP (1000 tC02e/y)   Carbon sink potential - Mid - Reforest retention of HWP (1000 tC02e/y)   Carbon sink potential - Mid - Ref								-813
Dasture (1000 10202e/y)   Carbon sink potential - High - Restore productivity (1000 10202e/y)   Carbon sink potential - Low - Accelerate regeneration (1000 10202e/y)   Carbon sink potential - Low - All (not counting overlap) (1000 10202e/y)   Carbon sink potential - Low - All (not counting overlap) (1000 1000 1000 1000 1000 1000 1000 10								
Carbon sink potential - High - Restore productivity (1000 tC02e/y)   Carbon sink potential - Low - Accelerate regeneration (1000 tC02e/y)   Carbon sink potential - Low - All (not counting overlap) (1000 tC02e/y)   Carbon sink potential - Low - All (not counting overlap) (1000 tC02e/y)   Carbon sink potential - Low - Avoid deforestation (1000 tC02e/y)   Carbon sink potential - Low - Extend rotation length (1000 tC02e/y)   Carbon sink potential - Low - Improve plantations (1000 tC02e/y)   Carbon sink potential - Low - Improve plantations (1000 tC02e/y)   Carbon sink potential - Low - Increase retention of HWP (1000 tC02e/y)   Carbon sink potential - Low - Increase trees outside forests (1000 tC02e/y)   Carbon sink potential - Low - Reforest ropland (1000 tC02e/y)   Carbon sink potential - Low - Reforest repland (1000 tC02e/y)   Carbon sink potential - Low - Reforest productivity (1000 tC02e/y)   Carbon sink potential - Low - Restore productivity (1000 tC02e/y)   Carbon sink potential - Low - Restore productivity (1000 tC02e/y)   Carbon sink potential - Low - Restore productivity (1000 tC02e/y)   Carbon sink potential - Mid - Accelerate regeneration (1000 tC02e/y)   Carbon sink potential - Mid - Accelerate regeneration (1000 tC02e/y)   Carbon sink potential - Mid - Avoid deforestation (1000 tC02e/y)   Carbon sink potential - Mid - Avoid deforestation (1000 tC02e/y)   Carbon sink potential - Mid - Lorease retention of HWP (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 retention of HWP (1000 tC02e/y)   Carbon sink potential - Mid - Increase retention of HWP (1000 tC02e/y)   Carbon sink potential - Mid - Restore   -1,805   Carbon sink potential - Mid - Restore   -1,805   Carbon sink potential - Mid - Restore   -1,805   Carbon sink potential - Mid - Restore   -1,807   Carbon sink potential - Mid - Restore   -1,807   Carbon sink potential - Mid - Restore   -1,807   Carbo								-2,422
productivity (1000 tC02e/y)   Carbon sink potential - Low - Accelerate   1-58   regeneration (1000 tC02e/y)   Carbon sink potential - Low - All (not counting overlap) (1000 tC02e/y)   Carbon sink potential - Low - Avoid deforestation (1000 tC02e/y)   Carbon sink potential - Low - Avoid deforestation (1000 tC02e/y)   Carbon sink potential - Low - Extend rotation length (1000 tC02e/y)   Carbon sink potential - Low - Improve   -1,420   -1,42								
Carbon sink potential - Low - Accelerate regeneration (1000 tC02e/v)   Carbon sink potential - Low - All (not counting overlap) (1000 tC02e/v)   Carbon sink potential - Low - All (not counting overlap) (1000 tC02e/v)   Carbon sink potential - Low - Extend rotation length (1000 tC02e/v)   Carbon sink potential - Low - Extend rotation length (1000 tC02e/v)   Carbon sink potential - Low - Improve plantations (1000 tC02e/v)   Carbon sink potential - Low - Improve plantations (1000 tC02e/v)   Carbon sink potential - Low - Increase retention of HWP (1000 tC02e/v)   Carbon sink potential - Low - Increase retention of HWP (1000 tC02e/v)   Carbon sink potential - Low - Reforest cropland (1000 tC02e/v)   Carbon sink potential - Low - Reforest repland (1000 tC02e/v)   Carbon sink potential - Low - Reforest repland (1000 tC02e/v)   Carbon sink potential - Low - Reforest repland (1000 tC02e/v)   Carbon sink potential - Low - Reforest repland (1000 tC02e/v)   Carbon sink potential - Improve repland (1000 tC02e/v)   Carbon sink potential - Mid - Accelerate regeneration (1000 tC02e/v)   Carbon sink potential - Mid - Accelerate regeneration (1000 tC02e/v)   Carbon sink potential - Mid - All (Inot counting overlap) (1000 tC02e/v)   Carbon sink potential - Mid - All (Inot counting overlap) (1000 tC02e/v)   Carbon sink potential - Mid - All (Inot counting overlap) (1000 tC02e/v)   Carbon sink potential - Mid - Improve plantations (1000 tC02e/v)   Carbon sink potential - Mid - Improve retention of HWP (1000 tC02e/v)   Carbon sink potential - Mid - Improve retention of HWP (1000 tC02e/v)   Carbon sink potential - Mid - Improve retention of HWP (1000 tC02e/v)   Carbon sink potential - Mid - Reforest resoutside forests (1000 tC02e/v)   Carbon sink potential - Mid - Reforest reconsist potential - Mid - Restorest reconsist potential - Mid - Restorest reconsist potential - Mid - Restorest r								-2,736
regeneration (1000 tCo2e/y) Carbon sink potential - Low - All (not counting overlap) (1000 tCo2e/y) Carbon sink potential - Low - Avoid deforestation (1000 tCo2e/y) Carbon sink potential - Low - Extend								
Carbon sink potential - Low - Alul (not counting overlap) (1000 tCO2e/y)   Carbon sink potential - Low - Avoid   -274								-158
Carbon sink potential - Low - Avoid deforestation (1000 tCO2e/v)   Carbon sink potential - Low - Extend rotation length (1000 tCO2e/v)   Carbon sink potential - Low - Extend rotation length (1000 tCO2e/v)   Carbon sink potential - Low - Improve plantations (1000 tCO2e/v)   Carbon sink potential - Low - Increase retention of HWP (1000 tCO2e/v)   Carbon sink potential - Low - Increase retention of HWP (1000 tCO2e/v)   Carbon sink potential - Low - Increase retending forest (1000 tCO2e/v)   Carbon sink potential - Low - Reforest rorspland (1000 tCO2e/v)   Carbon sink potential - Low - Reforest pasture (1000 tCO2e/v)   Carbon sink potential - Low - Reforest pasture (1000 tCO2e/v)   Carbon sink potential - Low - Restore productivity (1000 tCO2e/v)   Carbon sink potential - Mid - Accelerate regeneration (1000 tCO2e/v)   Carbon sink potential - Mid - Accelerate regeneration (1000 tCO2e/v)   Carbon sink potential - Mid - Avoid deforestation (1000 tCO2e/v)   Carbon sink potential - Mid - Avoid deforestation (1000 tCO2e/v)   Carbon sink potential - Mid - Avoid deforestation (1000 tCO2e/v)   Carbon sink potential - Mid - Extend rotation length (1000 tCO2e/v)   Carbon sink potential - Mid - Reforest plantations (1000 tCO2e/v)   Carbon sink potential - Mid - Increase retention of HWP (1000 tCO2e/v)   Carbon sink potential - Mid - Reforest plantations (1000 tCO2e/v)   Carbon sink potential - Mid - Reforest plantations (1000 tCO2e/v)   Carbon sink potential - Mid - Reforest plantation (1000 tCO2e/v)   Carbon sink potential - Mid - Reforest plantation (1000 tCO2e/v)   Carbon sink potential - Mid - Reforest plantation (1000 tCO2e/v)   Carbon sink potential - Mid - Reforest plantation (1000 tCO2e/v)   Carbon sink potential - Mid - Reforest plantation (1000 tCO2e/v)   Carbon sink potential - Mid - Reforest plantation (1000 tCO2e/v)   Carbon sink potential - Mid - Reforest plantation (1000 tCO2e/v)   Carbon sink potential - Mid - Reforest plantation (1000 tCO2e/v)   Carbon sink potential - Mid - Reforest plantation (1000 tCO2e/v								
Carbon sink potential - Low - Avoid deforestation (1000 tC02e/y)   Carbon sink potential - Low - Extend rotation length (1000 tC02e/y)   Carbon sink potential - Low - Improve plantations (1000 tC02e/y)   Carbon sink potential - Low - Improve plantations (1000 tC02e/y)   Carbon sink potential - Low - Increase retention of HWP (1000 tC02e/y)   Carbon sink potential - Low - Increase trees outside forests (1000 tC02e/y)   Carbon sink potential - Low - Reforest cropland (1000 tC02e/y)   Carbon sink potential - Low - Reforest roropland (1000 tC02e/y)   Carbon sink potential - Low - Reforest   -407 cropland (1000 tC02e/y)   Carbon sink potential - Low - Reforest   -807 cropland (1000 tC02e/y)   Carbon sink potential - Low - Restore productivity (1000 tC02e/y)   Carbon sink potential - Mid - Accelerate regeneration (1000 tC02e/y)   Carbon sink potential - Mid - Accelerate regeneration (1000 tC02e/y)   Carbon sink potential - Mid - Avoid deforestation (1000 tC02e/y)   Carbon sink potential - Mid - Avoid deforestation (1000 tC02e/y)   Carbon sink potential - Mid - Avoid deforestation (1000 tC02e/y)   Carbon sink potential - Mid - Improve plantations (1000 tC02e/y)   Carbon sink potential - Mid - Reforest   -5,059 rotation length (1000 tC02e/y)   Carbon sink potential - Mid - Increase retention of HWP (1000 tC02e/y)   Carbon sink potential - Mid - Reforest   -360 trees outside forests (1000 tC02e/y)   Carbon sink potential - Mid - Reforest   -360 trees outside forests (1000 tC02e/y)   Carbon sink potential - Mid - Reforest   -360 trees outside forests (1000 tC02e/y)   Carbon sink potential - Mid - Reforest   -360 trees outside forests (1000 tC02e/y)   Carbon sink potential - Mid - Reforest   -360 trees outside forests (1000 tC02e/y)   Carbon sink potential - Mid - Reforest   -360 trees outside forests (1000 tC02e/y)   Carbon sink potential - Mid - Reforest   -360 trees outside forests (1000 tC02e/y)   Carbon sink potential - Mid - Reforest   -360 trees outside forest   -360 trees outside forest   -360 trees outside fore								-12,261
deforestation (1000 tC02e/y)   Carbon sink potential - Low - Extend rotation length (1000 tC02e/y)   Carbon sink potential - Low - Improve plantations (1000 tC02e/y)   -1,420   -1,4								
Carbon sink potential - Low - Extend	•							-274
Carbon sink potential - Low - Improve   -1,420								
Carbon sink potential - Low - Improve plantations (1000 tC02e/y)								-2,808
Description								1 / 00
Carbon sink potential - Low - Increase retention of HWP (1000 tC02e/y)   Carbon sink potential - Low - Increase trees outside forests (1000 tC02e/y)   Carbon sink potential - Low - Reforest cropland (1000 tC02e/y)   Carbon sink potential - Low - Reforest   -407   Carbon sink potential - Low - Reforest   -407   Carbon sink potential - Low - Reforest   -407   Carbon sink potential - Low - Restore productivity (1000 tC02e/y)   Carbon sink potential - Mid - Accelerate regeneration (1000 tC02e/y)   Carbon sink potential - Mid - Accelerate 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)   -5,059   Carbon sink potential - Mid - Improve plantations (1000 tC02e/y)   -2,081   Carbon sink potential - Mid - Increase retention of HWP (1000 tC02e/y)   -11,805   Carbon sink potential - Mid - Increase retention of HWP (1000 tC02e/y)   Carbon sink potential - Mid - Reforest   -610   Carbon sink potential - Mid - Reforest   -610   Carbon sink potential - Mid - Reforest   -610   Carbon sink potential - Mid - Reforest   -1,303   pasture (1000 tC02e/y)   Carbon sink potential - Mid - Reforest   -1,303   pasture (1000 tC02e/y)   Carbon sink potential - Mid - Reforest   -1,829   Carbon sink potential - Mid - Restore   -1,829   Carbon sink potential - Mid - Reforest   -1,829   Carbon sink potential - Mid - Restore								-1,420
retention of HWP (1000 tCO2e/y)   Carbon sink potential - Low - Increase trees outside forests (1000 tCO2e/y)								
Carbon sink potential - Low - Increase trees outside forests (1000 tC02e/y)   Carbon sink potential - Low - Reforest cropland (1000 tC02e/y)   Carbon sink potential - Low - Reforest pasture (1000 tC02e/y)   Carbon sink potential - Low - Restore productivity (1000 tC02e/y)   Carbon sink potential - Mid - Accelerate regeneration (1000 tC02e/y)   Carbon sink potential - Mid - Accelerate 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   -960 deforestation (1000 tC02e/y)   Carbon sink potential - Mid - Increase retention of HWP (1000 tC02e/y)   Carbon sink potential - Mid - Increase retention of HWP (1000 tC02e/y)   Carbon sink potential - Mid - Increase retention of HWP (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 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 - Reforest pasture (1000 tC02e/y)   Carbon sink potential - Mid - Reforest pasture (1000 tC02e/y)   Carbon sink potential - Mid - Reforest pasture (1000 tC02e/y)   -1,829	•							-5,902
trees outside forests (1000 tCO2e/y) Carbon sink potential - Low - Reforest cropland (1000 tCO2e/y) Carbon sink potential - Low - Reforest pasture (1000 tCO2e/y) Carbon sink potential - Low - Restore productivity (1000 tCO2e/y) Carbon sink potential - Low - Restore productivity (1000 tCO2e/y) Carbon sink potential - Mid - Accelerate regeneration (1000 tCO2e/y) Carbon sink potential - Mid - All (not counting overlap) (1000 tCO2e/y) 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 cropland (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 - Reforest pasture (1000 tCO2e/y) Carbon sink potential - Mid - Restore - 1,829								107
Carbon sink potential - Low - Reforest cropland (1000 tC02e/y)  Carbon sink potential - Low - Reforest pasture (1000 tC02e/y)  Carbon sink potential - Low - Restore productivity (1000 tC02e/y)  Carbon sink potential - Mid - Accelerate 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 - Avoid deforestation (1000 tC02e/y)  Carbon sink potential - Mid - Extend rotation length (1000 tC02e/y)  Carbon sink potential - Mid - Increase retention of HWP (1000 tC02e/y)  Carbon sink potential - Mid - Increase retention of HWP (1000 tC02e/y)  Carbon sink potential - Mid - Increase retention of HWP (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 - 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 - Reforest pasture (1000 tc02e/y)								-101
Cropland (1000 tCO2e/y)   Carbon sink potential - Low - Reforest   pasture (1000 tCO2e/y)   Carbon sink potential - Low - Restore   productivity (1000 tCO2e/y)   Carbon sink potential - Mid - Accelerate regeneration (1000 tCO2e/y)   Carbon sink potential - Mid - Accelerate regeneration (1000 tCO2e/y)   Carbon sink potential - Mid - All (not counting overlap) (1000 tCO2e/y)   Carbon sink potential - Mid - Avoid deforestation (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 - 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 - Increase trees outside forests (1000 tCO2e/y)   Carbon sink potential - Mid - Reforest cropland (1000 tCO2e/y)   Carbon sink potential - Mid - Reforest   -610 tcopland (1000 tCO2e/y)   Carbon sink potential - Mid - Reforest   -610 tcopland (1000 tCO2e/y)   Carbon sink potential - Mid - Reforest   -610 tcopland (1000 tCO2e/y)   Carbon sink potential - Mid - Reforest   -1,303 pasture (1000 tCO2e/y)   Carbon sink potential - Mid - Restore   -1,829   -1,	• • • • • • • • • • • • • • • • • • • •							
Carbon sink potential - Low - Reforest pasture (1000 tCO2e/y)  Carbon sink potential - Low - Restore productivity (1000 tCO2e/y)  Carbon sink potential - Mid - Accelerate regeneration (1000 tCO2e/y)  Carbon sink potential - Mid - Accelerate regeneration (1000 tCO2e/y)  Carbon sink potential - Mid - All (not counting overlap) (1000 tCO2e/y)  Carbon sink potential - Mid - Avoid deforestation (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 - Increase trees outside forests (1000 tCO2e/y)  Carbon sink potential - Mid - Reforest cropland (1000 tCO2e/y)  Carbon sink potential - Mid - Reforest -610 cropland (1000 tCO2e/y)  Carbon sink potential - Mid - Reforest -610 cropland (1000 tCO2e/y)  Carbon sink potential - Mid - Reforest -610 cropland (1000 tCO2e/y)  Carbon sink potential - Mid - Reforest -610 cropland (1000 tCO2e/y)  Carbon sink potential - Mid - Reforest -610 cropland (1000 tCO2e/y)  Carbon sink potential - Mid - Reforest -610 cropland (1000 tCO2e/y)  Carbon sink potential - Mid - Reforest -610 cropland (1000 tCO2e/y)  Carbon sink potential - Mid - Reforest -610 cropland (1000 tCO2e/y)  Carbon sink potential - Mid - Reforest -610 cropland (1000 tCO2e/y)  Carbon sink potential - Mid - Reforest -610 cropland (1000 tCO2e/y)  Carbon sink potential - Mid - Reforest -610 cropland (1000 tCO2e/y)	•							-401
Desture (1000 tCO2e/y)   Carbon sink potential - Low - Restore   Productivity (1000 tCO2e/y)			-				-	-183
Carbon sink potential - Low - Restore productivity (1000 tCO2e/y)  Carbon sink potential - Mid - Accelerate regeneration (1000 tCO2e/y)  Carbon sink potential - Mid - All (not counting overlap) (1000 tCO2e/y)  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 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 pasture (1000 tCO2e/y)  Carbon sink potential - Mid - Reforest pasture (1000 tCO2e/y)  Carbon sink potential - Mid - Reforest pasture (1000 tCO2e/y)  Carbon sink potential - Mid - Reforest pasture (1000 tCO2e/y)  Carbon sink potential - Mid - Reforest pasture (1000 tCO2e/y)  Carbon sink potential - Mid - Reforest pasture (1000 tCO2e/y)  Carbon sink potential - Mid - Restore -1,829								100
productivity (1000 tC02e/y)  Carbon sink potential - Mid - Accelerate 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 - 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 trees outside forests (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 - 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 - Reforest pasture (1000 tC02e/y)  Carbon sink potential - Mid - Reforest pasture (1000 tC02e/y)								-922
Carbon sink potential - Mid - Accelerate regeneration (1000 tCO2e/y)  Carbon sink potential - Mid - All (not counting overlap) (1000 tCO2e/y)  Carbon sink potential - Mid - Avoid deforestation (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 - Increase trees outside forests (1000 tCO2e/y)  Carbon sink potential - Mid - Reforest cropland (1000 tCO2e/y)  Carbon sink potential - Mid - Reforest ropland (1000 tCO2e/y)  Carbon sink potential - Mid - Reforest ropland (1000 tCO2e/y)  Carbon sink potential - Mid - Reforest - 1,303  pasture (1000 tCO2e/y)  Carbon sink potential - Mid - Restore - 1,829								,
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 - 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 retention of HWP (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 - Reforest pasture (1000 tC02e/y)  Carbon sink potential - Mid - Restore -1,829			+					-236
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 - 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 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 - Reforest pasture (1000 tC02e/y)  Carbon sink potential - Mid - Reforest pasture (1000 tC02e/y)  Carbon sink potential - Mid - Restore -1,829								
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 - Improve plantations (1000 tC02e/y)  Carbon sink potential - Mid - Increase retention of HWP (1000 tC02e/y)  Carbon sink potential - Mid - Increase retention of HWP (1000 tC02e/y)  Carbon sink potential - Mid - Increase resolution of HWP (1000 tC02e/y)  Carbon sink potential - Mid - Increase rotation of HWP (1000 tC02e/y)  Carbon sink potential - Mid - Reforest ropland (1000 tC02e/y)  Carbon sink potential - Mid - Reforest ropland (1000 tC02e/y)  Carbon sink potential - Mid - Reforest ropland (1000 tC02e/y)  Carbon sink potential - Mid - Reforest ropland (1000 tC02e/y)  Carbon sink potential - Mid - Restore rotation resolution res								-24,243
Carbon sink potential - Mid - Avoid 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 - Increase retention of HWP (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 pasture (1000 tC02e/y)  Carbon sink potential - Mid - Reforest pasture (1000 tC02e/y)  Carbon sink potential - Mid - Restore -1,829	counting overlap) (1000 tC02e/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 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  -1,303 pasture (1000 tCO2e/y)  Carbon sink potential - Mid - Restore								-960
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 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 -1,829	deforestation (1000 tCO2e/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 pasture (1000 tC02e/y)  Carbon sink potential - Mid - Reforest pasture (1000 tC02e/y)  Carbon sink potential - Mid - Restore -1,829	Carbon sink potential - Mid - Extend							-5,059
plantations (1000 tCO2e/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 pasture (1000 tCO2e/y)  Carbon sink potential - Mid - Reforest pasture (1000 tCO2e/y)  Carbon sink potential - Mid - Restore -1,829	rotation length (1000 tCO2e/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 pasture (1000 tC02e/y)  Carbon sink potential - Mid - Reforest -1,303  pasture (1000 tC02e/y)  Carbon sink potential - Mid - Restore -1,829	Carbon sink potential - Mid - Improve							-2,081
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 pasture (1000 tCO2e/y)  Carbon sink potential - Mid - Restore -1,829	plantations (1000 tCO2e/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 pasture (1000 tC02e/y)  Carbon sink potential - Mid - Restore -1,829	Carbon sink potential - Mid - Increase							-11,805
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  -1,829	retention of HWP (1000 tCO2e/y)							
Carbon sink potential - Mid - Reforest -610 cropland (1000 tCO2e/y) Carbon sink potential - Mid - Reforest -1,303 pasture (1000 tCO2e/y) Carbon sink potential - Mid - Restore -1,829	Carbon sink potential - Mid - Increase							-360
cropland (1000 tCO2e/y)  Carbon sink potential - Mid - Reforest pasture (1000 tCO2e/y)  Carbon sink potential - Mid - Restore -1,829	trees outside forests (1000 tCO2e/y)							
Carbon sink potential - Mid - Reforest pasture (1000 tC02e/y) Carbon sink potential - Mid - Restore -1,303	•							-610
pasture (1000 tC02e/y) Carbon sink potential - Mid - Restore -1,829								
Carbon sink potential - Mid - Restore								-1,303
productivity (1000 tCO2e/y)								-1,829
	productivity (1000 tCO2e/y)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Land impacted for carbon sink potential -							51.5
High - Accelerate regeneration (1000							
hectares)							
Land impacted for carbon sink potential -							223
High - Avoid deforestation (over 30 years) (1000 hectares)							
Land impacted for carbon sink potential -							3,727
High - Extend rotation length (1000							3,121
hectares)							
Land impacted for carbon sink potential -							1,028
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 -							50.7
High - Increase trees outside forests							
(1000 hectares)							
Land impacted for carbon sink potential -							53.8
High - Reforest cropland (1000 hectares)							(0.0
Land impacted for carbon sink potential -							68.8
High - Reforest pasture (1000 hectares)							907
Land impacted for carbon sink potential - High - Restore productivity (1000							907
hectares)							
Land impacted for carbon sink potential -							6,110
High - Total impacted (over 30 years)							0,110
(1000 hectares)							
Land impacted for carbon sink potential -							25.7
Low - Accelerate regeneration (1000							
hectares)							
Land impacted for carbon sink potential -							209
Low - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							1,428
Low - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							514
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 -							26.7
Low - Increase trees outside forests							20.1
(1000 hectares)							
Land impacted for carbon sink potential -							26.9
Low - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							11.9
Low - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							549
Low - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							2,791
Low - Total impacted (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							38.6
Mid - Accelerate regeneration (1000							
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 -							216
Mid - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							2,578
Mid - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							774
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 -							38.7
Mid - Increase trees outside forests (1000							
hectares)							
Land impacted for carbon sink potential -							40.3
Mid - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							86.2
Mid - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							1,105
Mid - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							4,876
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	-9.71		-9.95				-8.06
uptake (Mt CO2e/y)							
Business-as-usual carbon sink - Retained	-4.82		-8.04				-8.46
in Hardwood Products (Mt CO2e/y)							
Business-as-usual carbon sink - Total (Mt	-14.5		-18				-16.5
CO2e/y)							

#### Table 66: REF scenario - IMPACTS - Health

Item	2020	2025	2030	2035	2040	2045	2050
Monetary damages from air pollution -		1,013	671	563	512	492	480
Coal (million 2019\$)							
Monetary damages from air pollution -		173	185	202	202	233	244
Natural Gas (million 2019\$)							
Monetary damages from air pollution -		1,057	1,092	1,127	1,167	1,208	1,251
Transportation (million 2019\$)							
Premature deaths from air pollution -		114	75.8	63.5	57.8	55.6	54.2
Coal (deaths)							
Premature deaths from air pollution -		19.6	20.9	22.8	22.8	26.3	27.6
Natural Gas (deaths)							
Premature deaths from air pollution -		119	123	127	131	136	141
Transportation (deaths)							