

Net-Zero America - Kentucky data

October 29, 2021 (updated November 17, 2023)

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

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Table 1: E+ scenario - IMPACTS - Health

lable 1: E+ scenario - IMPACTS - Health							
Item	2020	2025	2030	2035	2040	2045	2050
Premature deaths from air pollution -		85.9	0.275	0.273	0.256	0.195	0.019
Fuel Comb - Electric Generation - Coal							
(deaths)							
Premature deaths from air pollution -		18.7	14.5	8.05	6.39	2.78	0.997
Fuel Comb - Electric Generation - Natural							
Gas (deaths)							
Premature deaths from air pollution -		138	128	96.5	55.5	25.3	10.1
Mobile - On-Road (deaths)							
Premature deaths from air pollution - Gas		12.1	10.9	8.12	4.76	2.31	1.11
Stations (deaths)							
Premature deaths from air pollution -		17.3	14.1	9.54	5.27	2.49	1.02
Fuel Comb - Residential - Natural Gas							
(deaths)							
Premature deaths from air pollution -		1.74	1.39	0.932	0.523	0.212	0.063
Fuel Comb - Residential - Oil (deaths)							
Premature deaths from air pollution -		3.11	2.77	2.09	1.34	0.676	0.283
Fuel Comb - Residential - Other (deaths)							
Premature deaths from air pollution -		6.36	5.87	5.42	4.99	4.52	4.04
Fuel Comb - Comm/Institutional - Coal							
(deaths)							
Premature deaths from air pollution -		13.8	12.1	8.98	5.7	3.45	2.19
Fuel Comb - Comm/Institutional - Natural							
Gas (deaths)							
Premature deaths from air pollution -		1.47	1.19	0.887	0.616	0.408	0.255
Fuel Comb - Comm/Institutional - Oil							
(deaths)							
Premature deaths from air pollution -		0.833	0.687	0.552	0.424	0.306	0.198
Fuel Comb - Comm/Institutional - Other							
(deaths)							
Premature deaths from air pollution -		2.91	1.36	1.29	1.21	1.16	1.1
Industrial Processes - Coal Mining							
(deaths)							
Premature deaths from air pollution -	+	64.1	58.5	51.6	39.2	28.2	17
Industrial Processes - Oil & Gas		· · · · ·	00.0	00	07.2		
Production (deaths)							
Monetary damages from air pollution -	+	762	2.43	2.42	2.27	1.73	0.168
Fuel Comb - Electric Generation - Coal							000
(million \$2019)							
Monetary damages from air pollution -		166	129	71.3	56.6	24.6	8.83
Fuel Comb - Electric Generation - Natural		100	127	11.5	00.0	24.0	0.00
Gas (million \$2019)							
Monetary damages from air pollution -	+	1,223	1,135	858	493	225	90.1
Mobile - On-Road (million \$2019)		1,220	1,100	030	473	225	70.1
Monetary damages from air pollution -		107	96.7	71.9	42.2	20.5	9.87
Gas Stations (million \$2019)		101	70.1	11.7	42.2	20.5	7.01
Monetary damages from air pollution -		153	125	84.5	46.7	22	9.02
Fuel Comb - Residential - Natural Gas		155	125	04.5	40.7	22	9.02
(million \$2019)		15 /	10.0	0.07	1.71	1.00	0.5/1
Monetary damages from air pollution - Fuel Comb - Residential - Oil (million		15.4	12.3	8.26	4.64	1.88	0.561
,							
\$2019)		07.4	0/ 5	10.5	11.0	F 00	0.51
Monetary damages from air pollution -		27.6	24.5	18.5	11.8	5.99	2.51
Fuel Comb - Residential - Other (million							
\$2019)							
Monetary damages from air pollution -		56.3	51.9	48	44.2	40	35.8
Fuel Comb - Comm/Institutional - Coal							
(million \$2019)							
Monetary damages from air pollution -		122	107	79.5	50.5	30.6	19.4
Fuel Comb - Comm/Institutional - Natural							
Gas (million \$2019)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Monetary damages from air pollution -		13	10.5	7.85	5.45	3.61	2.26
Fuel Comb - Comm/Institutional - Oil							
(million \$2019)							
Monetary damages from air pollution -		7.37	6.08	4.88	3.75	2.71	1.76
Fuel Comb - Comm/Institutional - Other							
(million \$2019)							
Monetary damages from air pollution -		25.7	12	11.3	10.6	10.3	9.71
Industrial Processes - Coal Mining							
(million \$2019)							
Monetary damages from air pollution -		569	520	458	348	251	151
Industrial Processes - Oil & Gas							
Production (million \$2019)							

Table 2: E+ scenario - IMPACTS - Jobs

Table 2: <i>E+ scenario - IMPACTS - Jobs</i> Item	2020	2025	2030	2035	2040	2045	2050
By economic sector - Agriculture (jobs)	2020	96.7	484	1,257	991	1,105	890
By economic sector - Construction (jobs)		3,515	4,044	4,539	3,999	3,579	4,061
By economic sector - Manufacturing		3,386	3,853	4,798	4,404	3,703	4,164
(jobs)		0,000	0,000	4,170	7,707	0,100	4,104
By economic sector - Mining (jobs)		3,343	2,045	1,485	1,026	741	535
By economic sector - Other (jobs)		192	201	253	254	237	309
By economic sector - Pipeline (jobs)		384	485	428	317	312	353
By economic sector - Professional (jobs)		2,162	2,134	2,954	2,574	2,698	2,688
By economic sector - Trade (jobs)		2,011	1,608	1,587	1,369	1,252	1,242
By economic sector - Utilities (jobs)		5,251	5,513	6,118	5,553	4,508	4,961
By resource sector - Biomass (jobs)		295	1,304	3,542	2,961	4,033	3,812
By resource sector - CO2 (jobs)		24.2	1,338	1,452	1,106	1,664	2,392
By resource sector - Coal (jobs)		3,153	589	505	432	384	339
By resource sector - Grid (jobs)		5,655	6,702	8,551	7,326	5,968	6,504
By resource sector - Natural Gas (jobs)		4,926	4,400	3,428	3,561	2,066	1,686
By resource sector - Nuclear (jobs)		0	0	0	0	0	0
By resource sector - Oil (jobs)		4,580	3,754	2,855	2,011	1,414	933
By resource sector - Solar (jobs)		748	912	1,295	1,407	1,368	1,864
By resource sector - Wind (jobs)		959	1,368	1,791	1,683	1,236	1,673
By education level - All sectors - High		8,618	8,748	10,291	8,973	7,988	8,415
school diploma or less (jobs)							
By education level - All sectors -		6,292	6,321	7,134	6,308	5,479	5,924
Associates degree or some college (jobs)							
By education level - All sectors -		4,287	4,186	4,709	4,092	3,645	3,812
Bachelors degree (jobs)							
By education level - All sectors - Masters		1,012	986	1,133	981	892	923
or professional degree (jobs)							
By education level - All sectors - Doctoral		131	126	153	132	129	130
degree (jobs)							
Related work experience - All sectors -		2,907	2,965	3,440	3,013	2,674	2,828
None (jobs)							
Related work experience - All sectors - Up		3,973	4,029	4,817	4,205	3,809	4,017
to 1 year (jobs)		7.77	7.005	0.775	70/0	((01	(0 (0
Related work experience - All sectors - 1		7,467	7,395	8,445	7,369	6,491	6,842
to 4 years (jobs)		/ 700	/ 700	F 00/	1.770	/ 071	/ 050
Related work experience - All sectors - 4		4,720	4,709	5,296	4,649	4,071	4,350
to 10 years (jobs)		1.07/	10/7	1 / 00	1.050	1.000	11/7
Related work experience - All sectors - Over 10 years (jobs)		1,274	1,267	1,422	1,250	1,088	1,167
On-the-Job Training - All sectors - None		10/2	1,053	1.000	1,049	0/./	1,001
_		1,063	1,053	1,203	1,049	946	1,001
(jobs) On-the-Job Training - All sectors - Up to 1		13,606	13,595	15,827	13,806	12,312	12,933
year (jobs)		13,000	13,373	15,821	13,806	12,312	12,933

Table 2. F+	scenario	- IMPACTS -	Inhe	(continued))
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Item	2020	2025	2030	2035	2040	2045	2050
On-the-Job Training - All sectors - 1 to 4 years (jobs)		4,224	4,242	4,751	4,183	3,618	3,901
On-the-Job Training - All sectors - 4 to 10 years (jobs)		1,264	1,289	1,428	1,262	1,095	1,191
On-the-Job Training - All sectors - Over 10 years (jobs)		183	187	210	186	162	177
On-Site or In-Plant Training - All sectors - None (jobs)		3,174	3,221	3,752	3,282	2,930	3,095
On-Site or In-Plant Training - All sectors - Up to 1 year (jobs)		12,387	12,330	14,276	12,460	11,082	11,670
On-Site or In-Plant Training - All sectors - 1 to 4 years (jobs)		3,295	3,307	3,722	3,272	2,839	3,050
On-Site or In-Plant Training - All sectors - 4 to 10 years (jobs)		1,318	1,336	1,474	1,299	1,130	1,222
On-Site or In-Plant Training - All sectors - Over 10 years (jobs)		166	173	195	174	152	165
Wage income - All (million \$2019)		1,061	1,065	1,223	1,080	963	1,028

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

Item	2020	2025	2030	2035	2040	2045	2050
Oil consumption - Annual (million bbls)		88.2	77.2	61.2	46.1	34.1	24.3
Oil consumption - Cumulative (million							1,887
bbls)							
Oil production - Annual (million bbls)		2.93	2.94	2.94	2.33	1.89	1.26
Natural gas consumption - Annual (tcf)		263	222	178	134	84.2	58.4
Natural gas consumption - Cumulative							5,358
(tcf)							
Natural gas production - Annual (tcf)		96.2	91	79.2	67	53.1	41.3

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

Item	2020	2025	2030	2035	2040	2045	2050
Final energy use - Transportation (PJ)	426	391	344	288	236	205	193
Final energy use - Residential (PJ)	184	171	156	137	121	111	106
Final energy use - Commercial (PJ)	119	118	113	105	99.3	96.6	97
Final energy use - Industry (PJ)	382	396	409	403	409	414	415

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

Item	2020	2025	2030	2035	2040	2045	2050
Electricity distribution capital invested -		3.26	3.36	4.91	5.18	4.05	4.16
Cumulative 5-yr (billion \$2018)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Vehicle stocks - LDV – EV (1000 units)	10.4	368	726	1,977	3,229	4,229	5,229
Vehicle stocks - LDV – All others (1000	4,361	4,152	3,944	2,874	1,804	1,021	237
units)							
Light-duty vehicle capital costs vs. REF -		840	2,147	3,490	5,282	5,754	5,483
Cumulative 5-yr (million \$2018)							
Public EV charging plugs - DC Fast (1000	0.06		1.72		7.66		12.4
units)							
Public EV charging plugs - L2 (1000 units)	0.251		41.4		184		298

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

Item	2020	2025	2030	2035	2040	2045	2050
Sales of space heating units - Electric	26.6	42.5	77.8	85.8	86.2	86.1	86.1
Heat Pump (%)							
Sales of space heating units - Electric	26.5	25.4	10.6	7.34	7.19	7.29	7.32
Resistance (%)							
Sales of space heating units - Gas (%)	37.2	20.8	6.32	3.1	2.98	2.95	2.94
Sales of space heating units - Fossil (%)	9.65	11.3	5.2	3.78	3.67	3.61	3.61
Sales of water heating units - Electric	0	8.47	44.9	53	53.3	53.4	53.4
Heat Pump (%)							
Sales of water heating units - Electric	62.5	70	49.2	44.5	44.3	44.3	44.3
Resistance (%)							
Sales of water heating units - Gas Furnace	34.2	19.2	3.59	0.151	0	0	0
(%)							
Sales of water heating units - Other (%)	3.3	2.39	2.36	2.36	2.36	2.37	2.38
Sales of cooking units - Electric	76.9	81.8	96.9	99.8	100	100	100
Resistance (%)							
Sales of cooking units - Gas (%)	23.1	18.2	3.11	0.157	0	0	0
Residential HVAC investment in 2020s vs.		3.38	3.59				
REF - Cumulative 5-yr (billion \$2018)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Sales of space heating units - Electric	5.4	31	77.5	91	92.2	92.3	92.3
Heat Pump (%)							
Sales of space heating units - Electric	3.11	4.17	4.51	5.9	6.19	6.19	6.21
Resistance (%)							
Sales of space heating units - Gas (%)	76.4	60.5	17.1	3.03	1.58	1.53	1.52
Sales of space heating units - Fossil (%)	15.1	4.35	0.819	0.034	0	0	0
Sales of water heating units - Electric	0.117	10.6	55.7	65.7	66.2	66.2	66.2
Heat Pump (%)							
Sales of water heating units - Electric	4.29	9.87	28	32.1	32.3	32.2	32.3
Resistance (%)							
Sales of water heating units - Gas (%)	94.4	77.9	14.7	0.621	0	0	0
Sales of water heating units - Other (%)	1.17	1.57	1.57	1.57	1.57	1.56	1.55
Sales of cooking units - Electric	43.5	55.3	83.4	88.9	89.2	89.2	89.1
Resistance (%)							
Sales of cooking units - Gas (%)	56.5	44.7	16.6	11.1	10.8	10.8	10.9
Commercial HVAC investment in 2020s -		12,650	14,338				
Cumulative 5-yr (million \$2018)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Installed thermal - Coal (MW)	10,116	0	0	0	0	0	0
Installed thermal - Natural gas (MW)	7,857	10,932	12,861	12,400	9,318	7,755	8,472
Installed thermal - Nuclear (MW)	0	0	0	0	0	0	0
Installed renewables - Rooftop PV (MW)	45.2	72.8	103	147	208	288	390
Installed renewables - Solar - Base land use assumptions (MW)	68.3	68.3	68.3	68.3	68.3	68.3	145
Installed renewables - Solar -	68.3	68.3	68.3	68.3	68.3	68.3	68.3
Constrained land use assumptions (MW)							
Installed renewables - Wind - Constrained land use assumptions (MW)	0	0	73.6	421	465	465	465
Capital invested - Solar PV - Base (billion \$2018)		0	0	0	0	0	0.071
Capital invested - Solar PV - Constrained (billion \$2018)		0.091	0	0	0	0.132	0.08
Capital invested - Wind - Constrained (billion \$2018)		0	0.098	0.431	0.052	0	0

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

Item	2020	2025	2030	2035	2040	2045	2050
Capital invested - Biomass power plant (billion \$2018)	0	0	0	0	0	0	0
Capital invested - Biomass w/ccu allam power plant (billion \$2018)	0	0	0	0	0	0	0
Capital invested - Biomass w/ccu power plant (billion \$2018)	0	0	5.14	0	0	5.51	0

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

	 						
Item	2020	2025	2030	2035	2040	2045	2050
Solar - Base land use assumptions (GWh)	145	145	145	145	145	145	283
Wind - Base land use assumptions (GWh)	0	0	0	0	0	0	0
OffshoreWind - Base land use	0	0	0	0	0	0	0
assumptions (GWh)							
Solar - Constrained land use assumptions	145	145	145	145	145	145	145
(GWh)							
Wind - Constrained land use assumptions	0	0	217	1,055	1,146	1,146	1,146
(GWh)							
OffshoreWind - Constrained land use	0	0	0	0	0	0	0
assumptions (GWh)							
Biomass power plant (GWh)	0	0	0	0	0	0	0
Biomass w/ccu power plant (GWh)	0	0	5,771	5,771	5,771	11,950	11,950
Biomass w/ccu allam power plant (GWh)	0	0	0	0	0	0	0

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

Item	2020	2025	2030	2035	2040	2045	2050
Number of facilities - Power (quantity)	0	0	0	0	0	0	0
Number of facilities - Power ccu	0	0	4	4	4	9	9
(quantity)							
Number of facilities - Allam power w ccu	0	0	0	0	0	0	0
(quantity)							
Number of facilities - Beccs hydrogen	0	0	0	6	6	8	8
(quantity)							
Number of facilities - Diesel (quantity)	0	0	0	0	0	0	0
Number of facilities - Diesel ccu (quantity)	0	0	0	0	0	0	0
Number of facilities - Pyrolysis (quantity)	0	0	0	0	0	0	0
Number of facilities - Pyrolysis ccu	0	0	0	0	0	1	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
Conversion capital investment -		0	4,717	5,838	0	6,983	0
Cumulative 5-yr (million \$2018)							
Biomass purchases (million \$2018/y)		0	227	552	552	902	902

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

Item	2020	2025	2030	2035	2040	2045	2050
Annual - All (MMT)		0	5.71	20.1	22.8	35.3	34.1
Annual - BECCS (MMT)		0	5.71	13.2	13	21.4	21.4
Annual - NGCC (MMT)		0	0	6.95	6.44	10.4	9.12
Annual - Cement and lime (MMT)		0	0	0	3.32	3.42	3.53
Cumulative - All (MMT)		0	5.71	25.9	48.6	83.9	118
Cumulative - BECCS (MMT)		0	5.71	18.9	31.9	53.4	74.8
Cumulative - NGCC (MMT)		0	0	6.95	13.4	23.8	33
Cumulative - Cement and lime (MMT)		0	0	0	3.32	6.74	10.3

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

Item	2020	2025	2030	2035	2040	2045	2050
Trunk (km)		0	275	359	359	359	359
Spur (km)		0	230	1,031	1,097	2,176	2,477
All (km)		0	505	1,390	1,455	2,534	2,836
Cumulative investment - Trunk (million \$2018)		0	1,440	1,954	1,954	1,954	1,954
Cumulative investment - Spur (million \$2018)		0	284	929	966	1,808	2,046
Cumulative investment - All (million \$2018)		0	1,724	2,883	2,920	3,762	4,000

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

Item	2020	2025	2030	2035	2040	2045	2050
Annual (MMT)		0	1.1	1.76	3.61	5.16	6.52
Injection wells (wells)		0	1	4	7	12	15
Resource characterization, appraisal, permitting costs (million \$2020)		45.8	128	165	165	165	165
Wells and facilities construction costs (million \$2020)		0	30.5	119	212	354	439

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Low - Accelerate		T	T				-48.
regeneration (1000 tCO2e/y)							
Carbon sink potential - Low - Avoid							-256
deforestation (1000 tCO2e/y)							
Carbon sink potential - Low - Extend							-2,177
rotation length (1000 tCO2e/y)							
Carbon sink potential - Low - Improve							-24.5
plantations (1000 tCO2e/y)							
Carbon sink potential - Low - Increase							-1,555
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - Low - Increase							-338
trees outside forests (1000 tCO2e/y)							
Carbon sink potential - Low - Reforest							-704
cropland (1000 tCO2e/y)							
Carbon sink potential - Low - Reforest							-773
pasture (1000 tCO2e/y)							
Carbon sink potential - Low - Restore							-1,079
productivity (1000 tCO2e/y)							
Carbon sink potential - Low - All (not							-6,956
counting overlap) (1000 tCO2e/y)							
Carbon sink potential - Mid - Accelerate							-72.6
regeneration (1000 tCO2e/y)							
Carbon sink potential - Mid - Avoid							-897
deforestation (1000 tCO2e/y)							
Carbon sink potential - Mid - Extend							-3,923
rotation length (1000 tCO2e/y)							
Carbon sink potential - Mid - Improve							-35.9
plantations (1000 tCO2e/y)							
Carbon sink potential - Mid - Increase							-3,110
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - Mid - Increase							-65
trees outside forests (1000 tCO2e/y)							
Carbon sink potential - Mid - Reforest							-1,057
cropland (1000 tCO2e/y)							
Carbon sink potential - Mid - Reforest							-5,490
pasture (1000 tCO2e/y)							

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

Item Copper sink petential, Mid. Restons	2020	2025	2030	2035	2040	2045	2050 -2,139
Carbon sink potential - Mid - Restore							-2,139
productivity (1000 tC02e/y)							17.07
Carbon sink potential - Mid - All (not							-17,376
counting overlap) (1000 tC02e/y)							0/-
Carbon sink potential - High - Accelerate							-96.
regeneration (1000 tCO2e/y)							
Carbon sink potential - High - Avoid							-1,537
deforestation (1000 tC02e/y)							
Carbon sink potential - High - Extend							-5,669
rotation length (1000 tCO2e/y)							
Carbon sink potential - High - Improve							-48.
plantations (1000 tCO2e/y)							
Carbon sink potential - High - Increase							-4,665
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - High - Increase							-965
trees outside forests (1000 tCO2e/y)							
Carbon sink potential - High - Reforest							-1,409
cropland (1000 tCO2e/y)							
Carbon sink potential - High - Reforest							-10,207
pasture (1000 tC02e/y)							•
Carbon sink potential - High - All (not							-27,796
counting overlap) (1000 tCO2e/y)							,
Carbon sink potential - High - Restore							-3,200
productivity (1000 tCO2e/y)							0,200
Land impacted for carbon sink potential -							7.9
Low - Accelerate regeneration (1000							1.7
hectares)							
Land impacted for carbon sink potential -							195
Low - Avoid deforestation (over 30 years)							170
(1000 hectares)							
Land impacted for carbon sink potential -							1,107
							1,101
Low - Extend rotation length (1000							
hectares)							0.07
Land impacted for carbon sink potential -							8.86
Low - Improve plantations (1000							
hectares)							
Land impacted for carbon sink potential -							C
Low - Increase retention of HWP (1000							
hectares)							
Land impacted for carbon sink potential -							48.3
Low - Increase trees outside forests							
(1000 hectares)							
Land impacted for carbon sink potential -							46.6
Low - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -						T	50.3
Low - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							642
Low - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							2,107
Low - Total impacted (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							11.9
Mid - Accelerate regeneration (1000							
hectares)							
Land impacted for carbon sink potential -							202
Mid - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -			+				1,999
Mid - Extend rotation length (1000							.,,,,
hectares)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Land impacted for carbon sink potential - Mid - Improve plantations (1000 hectares)							13.3
Land impacted for carbon sink potential -							0
Mid - Increase retention of HWP (1000							U
hectares)							
Land impacted for carbon sink potential -							70
Mid - Increase trees outside forests (1000							
hectares)							
Land impacted for carbon sink potential -							69.9
Mid - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							363
Mid - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							1,293
Mid - Restore productivity (1000							
hectares)							/ 000
Land impacted for carbon sink potential - Mid - Total impacted (over 30 years) (1000							4,022
hectares)							
Land impacted for carbon sink potential -							15.8
High - Accelerate regeneration (1000							13.0
hectares)							
Land impacted for carbon sink potential -							208
High - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							2,891
High - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							17.7
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 -							91.7
High - Increase trees outside forests							71.1
(1000 hectares)							
Land impacted for carbon sink potential -							93.2
High - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							290
High - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							1,061
High - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							4,668
High - Total impacted (over 30 years)							
(1000 hectares)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Moderate							-432
deployment - Corn-ethanol to energy							
grasses (1000 tCO2e/y)							
Carbon sink potential - Moderate							-2,618
deployment - Cropland measures (1000							
tCO2e/y)							
Carbon sink potential - Moderate							-67.9
deployment - Permanent conservation							
cover (1000 tCO2e/y)							
Carbon sink potential - Moderate							-3,118
deployment - Total (1000 tCO2e/y)							

Table 16: E+ scenario - PILLAR 6: Land sinks - Agriculture (continued)Item202020252

100	_0_0			_000	_0.0		
Carbon sink potential - Aggressive							-432
deployment - Corn-ethanol to energy							
grasses (1000 tCO2e/y)							
Carbon sink potential - Aggressive							-4,963
deployment - Cropland measures (1000							•
tCO2e/y)							
Carbon sink potential - Aggressive							-136
deployment - Permanent conservation							-130
cover (1000 tC02e/y)							
Carbon sink potential - Aggressive							-5,532
deployment - Total (1000 tC02e/y)							
Land impacted for carbon sink - Moderate							188
deployment - Corn-ethanol to energy							
grasses (1000 hectares)							
Land impacted for carbon sink - Moderate							1,187
deployment - Cropland measures (1000							
hectares)							
Land impacted for carbon sink - Moderate							124
deployment - Permanent conservation							
cover (1000 hectares)							
Land impacted for carbon sink - Moderate							1,498
							1,470
deployment - Total (1000 hectares)							
Land impacted for carbon sink -							188
Aggressive deployment - Corn-ethanol to							
energy grasses (1000 hectares)							
Land impacted for carbon sink -							2,250
Aggressive deployment - Cropland							
measures (1000 hectares)							
Land impacted for carbon sink -							247
Aggressive deployment - Permanent							
conservation cover (1000 hectares)							
Land impacted for carbon sink -							2,685
Aggressive deployment - Total (1000							2,000
hectares)							
Table 17. E accompia IMPACTO Harlth							
Table 17: E- scenario - IMPACTS - Health							
Item	2020	2025	2030	2035	2040	2045	2050
Premature deaths from air pollution -		85.9	0.275	0.273	0.256	0.195	0.019
Fuel Comb - Electric Generation - Coal							0.017
(deaths)							0.017
(ueatris)							0.019
		16.1	9.67	3.71	1.59		
Premature deaths from air pollution -		16.1	9.67	3.71	1.59	0.547	0.312
Premature deaths from air pollution - Fuel Comb - Electric Generation - Natural		16.1	9.67	3.71	1.59		
Premature deaths from air pollution - Fuel Comb - Electric Generation - Natural Gas (deaths)						0.547	0.312
Premature deaths from air pollution - Fuel Comb - Electric Generation - Natural Gas (deaths) Premature deaths from air pollution -		16.1	9.67	3.71	1.59		
Premature deaths from air pollution - Fuel Comb - Electric Generation - Natural Gas (deaths) Premature deaths from air pollution - Mobile - On-Road (deaths)		140	141	136	122	96.8	0.312
Premature deaths from air pollution - Fuel Comb - Electric Generation - Natural Gas (deaths) Premature deaths from air pollution - Mobile - On-Road (deaths) Premature deaths from air pollution - Gas						0.547	0.312
Premature deaths from air pollution - Fuel Comb - Electric Generation - Natural Gas (deaths) Premature deaths from air pollution - Mobile - On-Road (deaths) Premature deaths from air pollution - Gas Stations (deaths)		140	141	136	122	96.8 8.05	0.312 66.2 5.51
Premature deaths from air pollution - Fuel Comb - Electric Generation - Natural Gas (deaths) Premature deaths from air pollution - Mobile - On-Road (deaths) Premature deaths from air pollution - Gas		140	141	136	122	96.8	0.312
Premature deaths from air pollution - Fuel Comb - Electric Generation - Natural Gas (deaths) Premature deaths from air pollution - Mobile - On-Road (deaths) Premature deaths from air pollution - Gas Stations (deaths)		140	141	136	122	96.8 8.05	0.312 66.2 5.51
Premature deaths from air pollution - Fuel Comb - Electric Generation - Natural Gas (deaths) Premature deaths from air pollution - Mobile - On-Road (deaths) Premature deaths from air pollution - Gas Stations (deaths) Premature deaths from air pollution -		140	141	136	122	96.8 8.05	0.312 66.2 5.51
Premature deaths from air pollution - Fuel Comb - Electric Generation - Natural Gas (deaths) Premature deaths from air pollution - Mobile - On-Road (deaths) Premature deaths from air pollution - Gas Stations (deaths) Premature deaths from air pollution - Fuel Comb - Residential - Natural Gas (deaths)		140 12.3 17.4	141 12.2 15.5	136 11.6 13.4	122 10.3 10.9	96.8 8.05 8.07	0.312 66.2 5.51 5.29
Premature deaths from air pollution - Fuel Comb - Electric Generation - Natural Gas (deaths) Premature deaths from air pollution - Mobile - On-Road (deaths) Premature deaths from air pollution - Gas Stations (deaths) Premature deaths from air pollution - Fuel Comb - Residential - Natural Gas (deaths) Premature deaths from air pollution -		140	141	136	122	96.8 8.05	0.312 66.2 5.51
Premature deaths from air pollution - Fuel Comb - Electric Generation - Natural Gas (deaths) Premature deaths from air pollution - Mobile - On-Road (deaths) Premature deaths from air pollution - Gas Stations (deaths) Premature deaths from air pollution - Fuel Comb - Residential - Natural Gas (deaths) Premature deaths from air pollution - Fuel Comb - Residential - Oil (deaths)		140 12.3 17.4	141 12.2 15.5	136 11.6 13.4 1.55	122 10.3 10.9	96.8 8.05 8.07	0.312 66.2 5.51 5.29
Premature deaths from air pollution - Fuel Comb - Electric Generation - Natural Gas (deaths) Premature deaths from air pollution - Mobile - On-Road (deaths) Premature deaths from air pollution - Gas Stations (deaths) Premature deaths from air pollution - Fuel Comb - Residential - Natural Gas (deaths) Premature deaths from air pollution - Fuel Comb - Residential - Oil (deaths) Premature deaths from air pollution -		140 12.3 17.4	141 12.2 15.5	136 11.6 13.4	122 10.3 10.9	96.8 8.05 8.07	0.312 66.2 5.51 5.29
Premature deaths from air pollution - Fuel Comb - Electric Generation - Natural Gas (deaths) Premature deaths from air pollution - Mobile - On-Road (deaths) Premature deaths from air pollution - Gas Stations (deaths) Premature deaths from air pollution - Fuel Comb - Residential - Natural Gas (deaths) Premature deaths from air pollution - Fuel Comb - Residential - Oil (deaths) Premature deaths from air pollution - Fuel Comb - Residential - Other (deaths)		140 12.3 17.4 1.77 3.15	141 12.2 15.5 1.66 3.1	136 11.6 13.4 1.55	122 10.3 10.9 1.33 2.69	0.547 96.8 8.05 8.07 0.968 2.09	0.312 66.2 5.51 5.29 0.608
Premature deaths from air pollution - Fuel Comb - Electric Generation - Natural Gas (deaths) Premature deaths from air pollution - Mobile - On-Road (deaths) Premature deaths from air pollution - Gas Stations (deaths) Premature deaths from air pollution - Fuel Comb - Residential - Natural Gas (deaths) Premature deaths from air pollution - Fuel Comb - Residential - Oil (deaths) Premature deaths from air pollution - Fuel Comb - Residential - Other (deaths) Premature deaths from air pollution -		140 12.3 17.4	141 12.2 15.5	136 11.6 13.4 1.55	122 10.3 10.9	96.8 8.05 8.07	0.312 66.2 5.51 5.29
Premature deaths from air pollution - Fuel Comb - Electric Generation - Natural Gas (deaths) Premature deaths from air pollution - Mobile - On-Road (deaths) Premature deaths from air pollution - Gas Stations (deaths) Premature deaths from air pollution - Fuel Comb - Residential - Natural Gas (deaths) Premature deaths from air pollution - Fuel Comb - Residential - Oil (deaths) Premature deaths from air pollution - Fuel Comb - Residential - Other (deaths) Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Coal		140 12.3 17.4 1.77 3.15	141 12.2 15.5 1.66 3.1	136 11.6 13.4 1.55	122 10.3 10.9 1.33 2.69	0.547 96.8 8.05 8.07 0.968 2.09	0.312 66.2 5.51 5.29 0.608
Premature deaths from air pollution - Fuel Comb - Electric Generation - Natural Gas (deaths) Premature deaths from air pollution - Mobile - On-Road (deaths) Premature deaths from air pollution - Gas Stations (deaths) Premature deaths from air pollution - Fuel Comb - Residential - Natural Gas (deaths) Premature deaths from air pollution - Fuel Comb - Residential - Oil (deaths) Premature deaths from air pollution - Fuel Comb - Residential - Other (deaths) Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Coal (deaths)		140 12.3 17.4 1.77 3.15 6.36	141 12.2 15.5 1.66 3.1 5.87	136 11.6 13.4 1.55 3 5.42	122 10.3 10.9 1.33 2.69 4.99	0.547 96.8 8.05 8.07 0.968 2.09 4.52	0.312 66.2 5.51 5.29 0.608 1.44 4.04
Premature deaths from air pollution - Fuel Comb - Electric Generation - Natural Gas (deaths) Premature deaths from air pollution - Mobile - On-Road (deaths) Premature deaths from air pollution - Gas Stations (deaths) Premature deaths from air pollution - Fuel Comb - Residential - Natural Gas (deaths) Premature deaths from air pollution - Fuel Comb - Residential - Oil (deaths) Premature deaths from air pollution - Fuel Comb - Residential - Other (deaths) Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Coal (deaths) Premature deaths from air pollution -		140 12.3 17.4 1.77 3.15	141 12.2 15.5 1.66 3.1	136 11.6 13.4 1.55	122 10.3 10.9 1.33 2.69	0.547 96.8 8.05 8.07 0.968 2.09	0.312 66.2 5.51 5.29 0.608
Premature deaths from air pollution - Fuel Comb - Electric Generation - Natural Gas (deaths) Premature deaths from air pollution - Mobile - On-Road (deaths) Premature deaths from air pollution - Gas Stations (deaths) Premature deaths from air pollution - Fuel Comb - Residential - Natural Gas (deaths) Premature deaths from air pollution - Fuel Comb - Residential - Oil (deaths) Premature deaths from air pollution - Fuel Comb - Residential - Other (deaths) Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Coal (deaths)		140 12.3 17.4 1.77 3.15 6.36	141 12.2 15.5 1.66 3.1 5.87	136 11.6 13.4 1.55 3 5.42	122 10.3 10.9 1.33 2.69 4.99	0.547 96.8 8.05 8.07 0.968 2.09 4.52	0.312 66.2 5.51 5.29 0.608 1.44 4.04

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

Item	2020	2025	2030	2035	2040	2045	2050
Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Oil (deaths)		1.48	1.31	1.15	0.967	0.779	0.606
Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Other (deaths)		0.833	0.737	0.647	0.561	0.479	0.404
Premature deaths from air pollution - Industrial Processes - Coal Mining (deaths)		2.81	1.36	1.3	1.23	1.17	1.06
Premature deaths from air pollution - Industrial Processes - Oil & Gas Production (deaths)		64	56.3	47.3	40.2	34.6	23.6
Monetary damages from air pollution - Fuel Comb - Electric Generation - Coal (million \$2019)		762	2.43	2.42	2.27	1.73	0.168
Monetary damages from air pollution - Fuel Comb - Electric Generation - Natural Gas (million \$2019)		142	85.7	32.8	14.1	4.84	2.76
Monetary damages from air pollution - Mobile - On-Road (million \$2019)		1,243	1,249	1,211	1,086	860	589
Monetary damages from air pollution - Gas Stations (million \$2019)		109	108	103	90.9	71.3	48.8
Monetary damages from air pollution - Fuel Comb - Residential - Natural Gas (million \$2019)		154	137	119	96.5	71.5	46.9
Monetary damages from air pollution - Fuel Comb - Residential - Oil (million \$2019)		15.7	14.7	13.7	11.8	8.58	5.38
Monetary damages from air pollution - Fuel Comb - Residential - Other (million \$2019)		27.9	27.4	26.6	23.8	18.5	12.8
Monetary damages from air pollution - Fuel Comb - Comm/Institutional - Coal (million \$2019)		56.3	51.9	48	44.2	40	35.8
Monetary damages from air pollution - Fuel Comb - Comm/Institutional - Natural Gas (million \$2019)		123	120	114	99.8	79.8	58.6
Monetary damages from air pollution - Fuel Comb - Comm/Institutional - Oil (million \$2019)		13.1	11.6	10.2	8.56	6.9	5.37
Monetary damages from air pollution - Fuel Comb - Comm/Institutional - Other (million \$2019)		7.37	6.52	5.73	4.96	4.24	3.58
Monetary damages from air pollution - Industrial Processes - Coal Mining (million \$2019)		24.8	12	11.5	10.8	10.3	9.38
Monetary damages from air pollution - Industrial Processes - Oil & Gas Production (million \$2019)		568	500	420	357	307	210

Table 18: E- scenario - IMPACTS - Jobs

Item	2020	2025	2030	2035	2040	2045	2050
By economic sector - Agriculture (jobs)		104	1,572	2,258	1,748	1,542	890
By economic sector - Construction (jobs)		3,105	3,743	4,732	4,473	4,787	4,758
By economic sector - Manufacturing		3,371	4,140	4,892	4,943	5,162	5,333
(jobs)							
By economic sector - Mining (jobs)		3,395	2,086	1,629	1,268	1,021	741
By economic sector - Other (jobs)		160	158	247	268	281	301
By economic sector - Pipeline (jobs)		385	591	552	434	495	587
By economic sector - Professional (jobs)		1,981	2,974	4,262	4,323	4,045	2,708

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

Table 10. E- Scellul 10 - IMPACTS - Jubs (Cui	-						
Item	2020	2025	2030	2035	2040	2045	2050
By economic sector - Trade (jobs)		1,996	1,642	2,030	2,059	1,851	1,335
By economic sector - Utilities (jobs)		4,426	4,528	5,656	5,353	5,738	5,575
By resource sector - Biomass (jobs)		307	4,202	7,433	7,292	6,568	3,682
By resource sector - CO2 (jobs)		24.5	2,274	2,494	1,912	2,854	4,080
By resource sector - Coal (jobs)		3,473	789	513	443	385	321
By resource sector - Grid (jobs)		4,519	4,411	6,787	6,599	7,328	6,374
By resource sector - Natural Gas (jobs)		4,185	3,410	2,949	2,907	2,182	1,709
By resource sector - Nuclear (jobs)		0	0	0	0	0	0
By resource sector - Oil (jobs)		4,621	3,964	3,411	2,833	2,264	1,510
By resource sector - Solar (jobs)		782	950	1,083	1,245	1,518	1,907
By resource sector - Wind (jobs)		1,012	1,433	1,588	1,638	1,823	2,648
By education level - All sectors - High		8,050	9,447	11,688	10,890	10,920	9,760
school diploma or less (jobs)							
By education level - All sectors -		5,794	6,305	7,640	7,291	7,434	6,909
Associates degree or some college (jobs)							
By education level - All sectors -		4,017	4,448	5,391	5,197	5,118	4,386
Bachelors degree (jobs)							
By education level - All sectors - Masters		940	1,078	1,336	1,290	1,260	1,035
or professional degree (jobs)							
By education level - All sectors - Doctoral		123	155	203	200	190	140
degree (jobs)							
Related work experience - All sectors -		2,690	3,143	3,886	3,659	3,668	3,272
None (jobs)							
Related work experience - All sectors - Up		3,723	4,449	5,599	5,287	5,273	4,616
to 1 year (jobs)							
Related work experience - All sectors - 1		6,956	7,766	9,434	8,905	8,900	7,917
to 4 years (jobs)							
Related work experience - All sectors - 4		4,369	4,794	5,801	5,540	5,586	5,058
to 10 years (jobs)							
Related work experience - All sectors -		1,185	1,281	1,538	1,479	1,496	1,367
Over 10 years (jobs)							
On-the-Job Training - All sectors - None		997	1,122	1,390	1,338	1,326	1,151
(jobs)							
On-the-Job Training - All sectors - Up to 1		12,735	14,665	18,074	17,101	17,016	14,925
year (jobs)							
On-the-Job Training - All sectors - 1 to 4		3,882	4,211	5,058	4,787	4,888	4,559
years (jobs)							
On-the-Job Training - All sectors - 4 to 10		1,139	1,243	1,509	1,424	1,469	1,381
years (jobs)							
On-the-Job Training - All sectors - Over 10		171	190	227	218	223	213
years (jobs)							
On-Site or In-Plant Training - All sectors -		2,955	3,478	4,288	4,064	4,049	3,575
None (jobs)							
On-Site or In-Plant Training - All sectors -		11,584	13,170	16,193	15,337	15,294	13,480
Up to 1 year (jobs)							
On-Site or In-Plant Training - All sectors -		3,038	3,315	3,993	3,776	3,844	3,562
1 to 4 years (jobs)							
On-Site or In-Plant Training - All sectors -		1,195	1,301	1,575	1,491	1,528	1,420
4 to 10 years (jobs)							
On-Site or In-Plant Training - All sectors -		150	168	208	200	206	192
Over 10 years (jobs)							
Wage income - All (million \$2019)		985	1,109	1,363	1,307	1,324	1,189

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

Item	2020	2025	2030	2035	2040	2045	2050
Final energy use - Transportation (PJ)	427	394	360	333	312	287	259
Final energy use - Residential (PJ)	184	172	163	153	142	129	118
Final energy use - Commercial (PJ)	119	119	117	114	110	106	103
Final energy use - Industry (PJ)	382	396	410	408	416	420	420

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

Item	2020	2025	2030	2035	2040	2045	2050
Electricity distribution capital invested -		2.71	2.75	3.26	3.36	4.25	4.44
Cumulative 5-yr (billion \$2018)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Vehicle stocks - LDV – EV (1000 units)	8.06	113	218	706	1,193	2,271	3,349
Vehicle stocks - LDV – All others (1000 units)	4,378	4,378	4,378	4,153	3,928	3,027	2,126
Light-duty vehicle capital costs vs. REF - Cumulative 5-yr (million \$2018)		0	135	286	962	3,037	4,422
Public EV charging plugs - DC Fast (1000 units)	0.06		0.518		2.83		7.94
Public EV charging plugs - L2 (1000 units)	0.251		12.5		68		191

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

Item	2020	2025	2030	2035	2040	2045	2050
Sales of space heating units - Electric	26.6	35.6	39.7	51.4	69.2	80.7	84.7
Heat Pump (%)							
Sales of space heating units - Electric	26.5	28.2	26.4	21.5	14.1	9.46	7.83
Resistance (%)							
Sales of space heating units - Gas (%)	37.2	23.6	22	17.4	10.1	5.25	3.56
Sales of space heating units - Fossil (%)	9.65	12.5	11.9	9.77	6.6	4.55	3.88
Sales of water heating units - Electric	0	1.46	5.6	17.5	35.8	47.8	51.9
Heat Pump (%)							
Sales of water heating units - Electric	62.5	74	71.8	64.8	54.3	47.5	45.1
Resistance (%)							
Sales of water heating units - Gas Furnace	34.2	22.2	20.3	15.3	7.52	2.39	0.624
(%)							
Sales of water heating units - Other (%)	3.3	2.39	2.37	2.38	2.39	2.38	2.38
Sales of cooking units - Electric	76.8	77.4	79.5	85.1	92.9	97.7	99.4
Resistance (%)							
Sales of cooking units - Gas (%)	23.2	22.6	20.5	14.9	7.09	2.29	0.616
Residential HVAC investment in 2020s vs.		3.35	3.47				
REF - Cumulative 5-yr (billion \$2018)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Sales of space heating units - Electric	5.4	22.1	27.3	42.8	66.9	83.6	89.9
Heat Pump (%)							
Sales of space heating units - Electric	3.11	4.17	4.24	4.4	4.84	5.52	5.99
Resistance (%)							
Sales of space heating units - Gas (%)	76.4	68.7	63.8	49.5	26.6	10.3	3.94
Sales of space heating units - Fossil (%)	15.1	5.03	4.61	3.36	1.65	0.539	0.139
Sales of water heating units - Electric	0.117	1.95	7.08	21.8	44.5	59.3	64.4
Heat Pump (%)							
Sales of water heating units - Electric	4.29	6.36	8.3	14.3	23.5	29.4	31.5
Resistance (%)							
Sales of water heating units - Gas (%)	94.4	90.1	83.1	62.2	30.5	9.74	2.54
Sales of water heating units - Other (%)	1.17	1.57	1.57	1.57	1.57	1.56	1.55
Sales of cooking units - Electric	43.5	47.1	51.3	61.6	76.1	85	88
Resistance (%)							
Sales of cooking units - Gas (%)	56.5	52.9	48.7	38.4	23.9	15	12
Commercial HVAC investment in 2020s -		12,642	14,325				
Cumulative 5-yr (million \$2018)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Installed thermal - Coal (MW)	10,116	0	0	0	0	0	0
Installed thermal - Natural gas (MW)	7,857	7,886	7,313	7,569	5,648	6,366	6,846
Installed thermal - Nuclear (MW)	0	0	0	0	0	0	0

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Low - Accelerate							-48.5
regeneration (1000 tCO2e/y)							
Carbon sink potential - Low - Avoid							-256
deforestation (1000 tCO2e/y)							
Carbon sink potential - Low - Extend							-2,177
rotation length (1000 tCO2e/y)							
Carbon sink potential - Low - Improve							-24.5
plantations (1000 tCO2e/y)							
Carbon sink potential - Low - Increase							-1,555
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - Low - Increase							-338
trees outside forests (1000 tCO2e/y)							
Carbon sink potential - Low - Reforest							-704
cropland (1000 tCO2e/y)							
Carbon sink potential - Low - Reforest							-773
pasture (1000 tCO2e/y)							
Carbon sink potential - Low - Restore							-1,079
productivity (1000 tCO2e/y)							
Carbon sink potential - Low - All (not							-6,956
counting overlap) (1000 tCO2e/y)							
Carbon sink potential - Mid - Accelerate							-72.6
regeneration (1000 tCO2e/y)							
Carbon sink potential - Mid - Avoid							-897
deforestation (1000 tCO2e/y)							
Carbon sink potential - Mid - Extend							-3,923
rotation length (1000 tCO2e/y)							
Carbon sink potential - Mid - Improve							-35.9
plantations (1000 tCO2e/y)							
Carbon sink potential - Mid - Increase							-3,110
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - Mid - Increase							-651
trees outside forests (1000 tCO2e/y)							
Carbon sink potential - Mid - Reforest							-1,057
cropland (1000 tCO2e/y)							
Carbon sink potential - Mid - Reforest							-5,490
pasture (1000 tCO2e/y)							
Carbon sink potential - Mid - Restore							-2,139
productivity (1000 tCO2e/y)							
Carbon sink potential - Mid - All (not							-17,376
counting overlap) (1000 tCO2e/y)							
Carbon sink potential - High - Accelerate							-96.7
regeneration (1000 tCO2e/y)							
Carbon sink potential - High - Avoid							-1,537
deforestation (1000 tCO2e/y)							
Carbon sink potential - High - Extend							-5,669
rotation length (1000 tCO2e/y)							
Carbon sink potential - High - Improve							-48.1
plantations (1000 tCO2e/y)							
Carbon sink potential - High - Increase							-4,665
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - High - Increase							-965
trees outside forests (1000 tCO2e/y)							
Carbon sink potential - High - Reforest							-1,409
cropland (1000 tCO2e/y)							, , , ,

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

Item Carbon sink potential - High - Reforest	2020	2025	2030	2035	2040	2045	2050 -10,207
pasture (1000 tCO2e/y)							•
Carbon sink potential - High - All (not counting overlap) (1000 tCO2e/y)							-27,796
Carbon sink potential - High - Restore productivity (1000 tCO2e/y)							-3,200
Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)							7.91
Land impacted for carbon sink potential - Low - Avoid deforestation (over 30 years) (1000 hectares)							195
Land impacted for carbon sink potential - Low - Extend rotation length (1000 hectares)							1,107
Land impacted for carbon sink potential - Low - Improve plantations (1000 hectares)							8.86
Land impacted for carbon sink potential - Low - Increase retention of HWP (1000 hectares)							0
Land impacted for carbon sink potential - Low - Increase trees outside forests (1000 hectares)							48.3
Land impacted for carbon sink potential - Low - Reforest cropland (1000 hectares)							46.6
Land impacted for carbon sink potential - Low - Reforest pasture (1000 hectares)							50.3
Land impacted for carbon sink potential - Low - Restore productivity (1000 hectares)							642
Land impacted for carbon sink potential - Low - Total impacted (over 30 years) (1000 hectares)							2,107
Land impacted for carbon sink potential - Mid - Accelerate regeneration (1000 hectares)							11.9
Land impacted for carbon sink potential - Mid - Avoid deforestation (over 30 years) (1000 hectares)							202
Land impacted for carbon sink potential - Mid - Extend rotation length (1000 hectares)							1,999
Land impacted for carbon sink potential - Mid - Improve plantations (1000 hectares)							13.3
Land impacted for carbon sink potential - Mid - Increase retention of HWP (1000 hectares)							0
Land impacted for carbon sink potential - Mid - Increase trees outside forests (1000 hectares)							70
Land impacted for carbon sink potential - Mid - Reforest cropland (1000 hectares)							69.9
Land impacted for carbon sink potential -							363
Mid - Reforest pasture (1000 hectares) Land impacted for carbon sink potential - Mid - Restore productivity (1000							1,293
hectares) Land impacted for carbon sink potential - Mid - Total impacted (over 30 years) (1000							4,022

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

Item	2020	2025	2030	2035	2040	2045	2050
Land impacted for carbon sink potential - High - Accelerate regeneration (1000							15.8
hectares)							
Land impacted for carbon sink potential -							208
High - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							2,891
High - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							17.7
High - Improve plantations (1000							
hectares)							0
Land impacted for carbon sink potential - High - Increase retention of HWP (1000							U
hectares)							
Land impacted for carbon sink potential -		-					91.7
High - Increase trees outside forests							71.1
(1000 hectares)							
Land impacted for carbon sink potential -							93.2
High - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							290
High - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							1,061
High - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							4,668
High - Total impacted (over 30 years)							
(1000 hectares)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Moderate							-432
deployment - Corn-ethanol to energy							
grasses (1000 tCO2e/y)							
Carbon sink potential - Moderate							-2,618
deployment - Cropland measures (1000							
tCO2e/y)							
Carbon sink potential - Moderate							-67.9
deployment - Permanent conservation							
cover (1000 tCO2e/y)							
Carbon sink potential - Moderate							-3,118
deployment - Total (1000 tCO2e/y)							
Carbon sink potential - Aggressive							-432
deployment - Corn-ethanol to energy							
grasses (1000 tCO2e/y)							
Carbon sink potential - Aggressive							-4,963
deployment - Cropland measures (1000							
tCO2e/y)							
Carbon sink potential - Aggressive							-136
deployment - Permanent conservation							
cover (1000 tCO2e/y)							
Carbon sink potential - Aggressive							-5,532
deployment - Total (1000 tCO2e/y)							
Land impacted for carbon sink - Moderate							188
deployment - Corn-ethanol to energy							
grasses (1000 hectares)							
Land impacted for carbon sink - Moderate							1,187
deployment - Cropland measures (1000							
hectares)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Land impacted for carbon sink - Moderate							124
deployment - Permanent conservation							
cover (1000 hectares)							
Land impacted for carbon sink - Moderate							1,498
deployment - Total (1000 hectares)							
Land impacted for carbon sink -							188
Aggressive deployment - Corn-ethanol to							
energy grasses (1000 hectares)							
Land impacted for carbon sink -							2,250
Aggressive deployment - Cropland							
measures (1000 hectares)							
Land impacted for carbon sink -							247
Aggressive deployment - Permanent							
conservation cover (1000 hectares)							
Land impacted for carbon sink -							2,685
Aggressive deployment - Total (1000							
hectares)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Premature deaths from air pollution -		85.9	0.275	0.273	0.256	0.195	0.019
Fuel Comb - Electric Generation - Coal							
(deaths)							
Premature deaths from air pollution -		15.6	11.1	6.16	3.78	1.16	0.366
Fuel Comb - Electric Generation - Natural							
Gas (deaths)							
Premature deaths from air pollution -		138	128	96.5	55.5	25.3	10.1
Mobile - On-Road (deaths)							
Premature deaths from air pollution - Gas		12.1	10.9	8.12	4.76	2.31	1.11
Stations (deaths)							
Premature deaths from air pollution -		17.3	14.1	9.54	5.27	2.49	1.02
Fuel Comb - Residential - Natural Gas							
(deaths)							
Premature deaths from air pollution -		1.74	1.39	0.932	0.523	0.212	0.063
Fuel Comb - Residential - Oil (deaths)							
Premature deaths from air pollution -		3.11	2.77	2.09	1.34	0.676	0.283
Fuel Comb - Residential - Other (deaths)							
Premature deaths from air pollution -		6.36	5.87	5.42	4.99	4.52	4.04
Fuel Comb - Comm/Institutional - Coal							
(deaths)							
Premature deaths from air pollution -		13.8	12.1	8.98	5.7	3.45	2.19
Fuel Comb - Comm/Institutional - Natural							
Gas (deaths)							
Premature deaths from air pollution -		1.47	1.19	0.887	0.616	0.408	0.255
Fuel Comb - Comm/Institutional - Oil							
(deaths)							
Premature deaths from air pollution -		0.833	0.687	0.552	0.424	0.306	0.198
Fuel Comb - Comm/Institutional - Other							
(deaths)							
Premature deaths from air pollution -		3.15	1.36	1.28	1.2	1.16	1.02
Industrial Processes - Coal Mining							
(deaths)							
Premature deaths from air pollution -		63	57.6	48.2	33.8	20.1	2.86
Industrial Processes - Oil & Gas							
Production (deaths)							
Monetary damages from air pollution -		762	2.43	2.42	2.27	1.73	0.168
Fuel Comb - Electric Generation - Coal							
(million \$2019)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Monetary damages from air pollution - Fuel Comb - Electric Generation - Natural Gas (million \$2019)		138	98.7	54.6	33.5	10.3	3.25
Monetary damages from air pollution - Mobile - On-Road (million \$2019)		1,223	1,135	858	493	225	90.1
Monetary damages from air pollution - Gas Stations (million \$2019)		107	96.7	71.9	42.2	20.5	9.87
Monetary damages from air pollution - Fuel Comb - Residential - Natural Gas (million \$2019)		153	125	84.5	46.7	22	9.02
Monetary damages from air pollution - Fuel Comb - Residential - Oil (million \$2019)		15.4	12.3	8.26	4.64	1.88	0.561
Monetary damages from air pollution - Fuel Comb - Residential - Other (million \$2019)		27.6	24.5	18.5	11.8	5.99	2.51
Monetary damages from air pollution - Fuel Comb - Comm/Institutional - Coal (million \$2019)		56.3	51.9	48	44.2	40	35.8
Monetary damages from air pollution - Fuel Comb - Comm/Institutional - Natural Gas (million \$2019)		122	107	79.5	50.5	30.6	19.4
Monetary damages from air pollution - Fuel Comb - Comm/Institutional - Oil (million \$2019)		13	10.5	7.85	5.45	3.61	2.26
Monetary damages from air pollution - Fuel Comb - Comm/Institutional - Other (million \$2019)		7.37	6.08	4.88	3.75	2.71	1.76
Monetary damages from air pollution - Industrial Processes - Coal Mining (million \$2019)		27.8	12	11.3	10.6	10.3	8.97
Monetary damages from air pollution - Industrial Processes - Oil & Gas Production (million \$2019)		559	512	428	300	178	25.4

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

Item	2020	2025	2030	2035	2040	2045	2050
By economic sector - Agriculture (jobs)		96.9	135	1,157	913	943	893
By economic sector - Construction (jobs)		3,162	2,841	3,398	2,965	2,949	6,619
By economic sector - Manufacturing		3,524	4,110	5,839	5,954	6,874	7,836
(jobs)							
By economic sector - Mining (jobs)		3,413	1,976	1,349	847	499	169
By economic sector - Other (jobs)		167	151	218	220	320	1,243
By economic sector - Pipeline (jobs)		375	317	229	153	89.7	27.1
By economic sector - Professional (jobs)		1,982	1,393	2,509	2,311	2,503	4,231
By economic sector - Trade (jobs)		1,945	1,381	1,366	1,196	1,171	2,258
By economic sector - Utilities (jobs)		4,527	3,613	4,490	4,003	3,514	6,510
By resource sector - Biomass (jobs)		282	348	3,087	2,952	3,505	3,938
By resource sector - CO2 (jobs)		0	0	0	0.001	0.001	0
By resource sector - Coal (jobs)		3,336	589	504	431	383	298
By resource sector - Grid (jobs)		4,807	4,774	7,022	5,819	5,644	11,318
By resource sector - Natural Gas (jobs)		4,260	3,640	2,799	2,672	1,645	1,960
By resource sector - Nuclear (jobs)		0	0	0	0	0	0
By resource sector - Oil (jobs)		4,581	3,719	2,766	1,809	1,039	48.8
By resource sector - Solar (jobs)		830	1,251	1,868	2,231	3,695	8,205
By resource sector - Wind (jobs)		1,096	1,596	2,510	2,649	2,950	4,019
By education level - All sectors - High		8,189	6,827	9,086	8,165	8,325	12,952
school diploma or less (jobs)							

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

Item	2020	2025	2030	2035	2040	2045	2050
By education level - All sectors -		5,889	4,914	6,184	5,642	5,722	9,362
Associates degree or some college (jobs)							
By education level - All sectors -		4,045	3,327	4,172	3,762	3,809	5,861
Bachelors degree (jobs)							
By education level - All sectors - Masters		946	755	981	876	884	1,412
or professional degree (jobs)							
By education level - All sectors - Doctoral		123	93.1	131	118	122	199
degree (jobs)							
Related work experience - All sectors -		2,728	2,282	2,985	2,691	2,724	4,343
None (jobs)							
Related work experience - All sectors - Up		3,787	3,163	4,310	3,912	4,066	6,316
to 1 year (jobs)							
Related work experience - All sectors - 1		7,048	5,780	7,398	6,643	6,699	10,565
to 4 years (jobs)							
Related work experience - All sectors - 4		4,425	3,671	4,591	4,155	4,187	6,727
to 10 years (jobs)							
Related work experience - All sectors -		1,203	1,020	1,271	1,160	1,185	1,835
Over 10 years (jobs)							
On-the-Job Training - All sectors - None		1,006	834	1,060	961	990	1,592
(jobs)							
On-the-Job Training - All sectors - Up to 1		12,910	10,722	14,102	12,747	13,039	20,050
year (jobs)							
On-the-Job Training - All sectors - 1 to 4		3,946	3,272	4,066	3,669	3,671	6,057
years (jobs)							
On-the-Job Training - All sectors - 4 to 10		1,156	934	1,135	1,007	974	1,796
years (jobs)							
On-the-Job Training - All sectors - Over 10		174	154	192	178	187	290
years (jobs)							
On-Site or In-Plant Training - All sectors -		2,992	2,516	3,325	3,018	3,101	4,876
None (jobs)							
On-Site or In-Plant Training - All sectors -		11,748	9,724	12,674	11,450	11,687	18,087
Up to 1 year (jobs)							
On-Site or In-Plant Training - All sectors -		3,088	2,565	3,208	2,893	2,905	4,744
1 to 4 years (jobs)							
On-Site or In-Plant Training - All sectors -		1,211	982	1,184	1,052	1,019	1,826
4 to 10 years (jobs)							
On-Site or In-Plant Training - All sectors -		153	130	164	150	150	253
Over 10 years (jobs)							
Wage income - All (million \$2019)		997	828	1,060	961	972	1,556

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

Item	2020	2025	2030	2035	2040	2045	2050
Final energy use - Transportation (PJ)	426	391	344	288	236	205	193
Final energy use - Residential (PJ)	184	171	156	137	121	111	106
Final energy use - Commercial (PJ)	119	118	113	105	99.3	96.6	97
Final energy use - Industry (PJ)	382	396	409	403	409	414	415

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

Item	2020	2025	2030	2035	2040	2045	2050
Electricity distribution capital invested -		3.26	3.36	4.91	5.18	4.05	4.16
Cumulative 5-yr (billion \$2018)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Vehicle stocks - LDV – EV (1000 units)	10.4	368	726	1,977	3,229	4,229	5,229
Vehicle stocks - LDV – All others (1000 units)	4,361	4,152	3,944	2,874	1,804	1,021	237

Table 31: E+RE+ scenario - PILLAR 1: Efficiency/Electrification - Transportation (continued)

Item	2020	2025	2030	2035	2040	2045	2050
Light-duty vehicle capital costs vs. REF -		840	2,147	3,490	5,282	5,754	5,483
Cumulative 5-yr (million \$2018)							
Public EV charging plugs - DC Fast (1000	0.06		1.72		7.66		12.4
units)							
Public EV charging plugs - L2 (1000 units)	0.251		41.4		184		298

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

Item	2020	2025	2030	2035	2040	2045	2050
Sales of space heating units - Electric	26.6	42.5	77.8	85.8	86.2	86.1	86.1
Heat Pump (%)							
Sales of space heating units - Electric	26.5	25.4	10.6	7.34	7.19	7.29	7.32
Resistance (%)							
Sales of space heating units - Gas (%)	37.2	20.8	6.32	3.1	2.98	2.95	2.94
Sales of space heating units - Fossil (%)	9.65	11.3	5.2	3.78	3.67	3.61	3.61
Sales of water heating units - Electric	0	8.47	44.9	53	53.3	53.4	53.4
Heat Pump (%)							
Sales of water heating units - Electric	62.5	70	49.2	44.5	44.3	44.3	44.3
Resistance (%)							
Sales of water heating units - Gas Furnace	34.2	19.2	3.59	0.151	0	0	0
(%)							
Sales of water heating units - Other (%)	3.3	2.39	2.36	2.36	2.36	2.37	2.38
Sales of cooking units - Electric	76.9	81.8	96.9	99.8	100	100	100
Resistance (%)							
Sales of cooking units - Gas (%)	23.1	18.2	3.11	0.157	0	0	0
Residential HVAC investment in 2020s vs.		3.38	3.59				
REF - Cumulative 5-yr (billion \$2018)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Sales of space heating units - Electric	5.4	31	77.5	91	92.2	92.3	92.3
Heat Pump (%)							
Sales of space heating units - Electric	3.11	4.17	4.51	5.9	6.19	6.19	6.21
Resistance (%)							
Sales of space heating units - Gas (%)	76.4	60.5	17.1	3.03	1.58	1.53	1.52
Sales of space heating units - Fossil (%)	15.1	4.35	0.819	0.034	0	0	0
Sales of water heating units - Electric	0.117	10.6	55.7	65.7	66.2	66.2	66.2
Heat Pump (%)							
Sales of water heating units - Electric	4.29	9.87	28	32.1	32.3	32.2	32.3
Resistance (%)							
Sales of water heating units - Gas (%)	94.4	77.9	14.7	0.621	0	0	0
Sales of water heating units - Other (%)	1.17	1.57	1.57	1.57	1.57	1.56	1.55
Sales of cooking units - Electric	43.5	55.3	83.4	88.9	89.2	89.2	89.1
Resistance (%)							
Sales of cooking units - Gas (%)	56.5	44.7	16.6	11.1	10.8	10.8	10.9
Commercial HVAC investment in 2020s -		12,650	14,338				
Cumulative 5-yr (million \$2018)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Installed thermal - Coal (MW)	10,116	0	0	0	0	0	0
Installed thermal - Natural gas (MW)	7,898	8,899	8,582	8,821	5,442	6,089	11,096
Installed thermal - Nuclear (MW)	0	0	0	0	0	0	0
Installed renewables - Rooftop PV (MW)	45.2	72.8	103	147	208	288	390
Installed renewables - Solar - Base land use assumptions (MW)	68.3	68.3	68.3	68.3	68.3	597	6,284
Installed renewables - Wind - Base land use assumptions (MW)	0	0	0	0	256	359	524

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

Item	2020	2025	2030	2035	2040	2045	2050
Installed renewables - Solar - Constrained land use assumptions (MW)	68.4	68.4	68.4	68.4	68.4	799	6,559
Installed renewables - Wind - Constrained land use assumptions (MW)	0	0	73.6	465	465	465	465
Installed renewables - Offshore Wind - Constrained land use assumptions (MW)	0	0	0	0	0	0	0
Capital invested - Solar PV - Base (billion \$2018)		0	0	0	0	0.519	5.27
Capital invested - Wind - Base (billion \$2018)		0	0	0	0.302	0.116	0.175

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

Item	2020	2025	2030	2035	2040	2045	2050
Solar - Base land use assumptions (GWh)	145	145	145	145	145	1,075	11,440
Wind - Base land use assumptions (GWh)	0	0	0	0	623	860	1,310
OffshoreWind - Base land use	0	0	0	0	0	0	0
assumptions (GWh)							
Solar - Constrained land use assumptions	289	289	289	289	289	2,876	23,756
(GWh)							
Wind - Constrained land use assumptions	0	0	433	2,292	2,292	2,292	2,292
(GWh)							
OffshoreWind - Constrained land use	0	0	0	0	0	0	0
assumptions (GWh)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Low - Accelerate							-48.5
regeneration (1000 tCO2e/y)							
Carbon sink potential - Low - Avoid							-256
deforestation (1000 tCO2e/y)							
Carbon sink potential - Low - Extend							-2,177
rotation length (1000 tCO2e/y)							
Carbon sink potential - Low - Improve							-24.5
plantations (1000 tCO2e/y)							
Carbon sink potential - Low - Increase							-1,555
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - Low - Increase							-338
trees outside forests (1000 tCO2e/y)							
Carbon sink potential - Low - Reforest							-704
cropland (1000 tCO2e/y)							
Carbon sink potential - Low - Reforest							-773
pasture (1000 tCO2e/y)							
Carbon sink potential - Low - Restore							-1,079
productivity (1000 tCO2e/y)							
Carbon sink potential - Low - All (not							-6,956
counting overlap) (1000 tCO2e/y)							
Carbon sink potential - Mid - Accelerate							-72.6
regeneration (1000 tCO2e/y)							
Carbon sink potential - Mid - Avoid							-897
deforestation (1000 tCO2e/y)							
Carbon sink potential - Mid - Extend							-3,923
rotation length (1000 tCO2e/y)							
Carbon sink potential - Mid - Improve							-35.9
plantations (1000 tCO2e/y)							
Carbon sink potential - Mid - Increase							-3,110
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - Mid - Increase							-651
trees outside forests (1000 tCO2e/y)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Mid - Reforest							-1,057
cropland (1000 tCO2e/y)							
Carbon sink potential - Mid - Reforest							-5,490
pasture (1000 tC02e/y)							0.100
Carbon sink potential - Mid - Restore							-2,139
productivity (1000 tCO2e/y) Carbon sink potential - Mid - All (not							-17,376
counting overlap) (1000 tC02e/y)							-17,376
Carbon sink potential - High - Accelerate							-96.7
regeneration (1000 tC02e/y)							-70.1
Carbon sink potential - High - Avoid							-1,537
deforestation (1000 tC02e/y)							-1,001
Carbon sink potential - High - Extend							-5,669
rotation length (1000 tC02e/y)							-5,007
Carbon sink potential - High - Improve							-48.1
plantations (1000 tCO2e/y)							70.1
Carbon sink potential - High - Increase							-4,665
retention of HWP (1000 tCO2e/y)							.,000
Carbon sink potential - High - Increase							-965
trees outside forests (1000 tCO2e/y)							,00
Carbon sink potential - High - Reforest							-1,409
cropland (1000 tCO2e/y)							1, 107
Carbon sink potential - High - Reforest							-10,207
pasture (1000 tC02e/y)							10,201
Carbon sink potential - High - All (not							-27,796
counting overlap) (1000 tC02e/y)							,. , o
Carbon sink potential - High - Restore							-3,200
productivity (1000 tCO2e/y)							-,
Land impacted for carbon sink potential -							7.91
Low - Accelerate regeneration (1000							
hectares)							
Land impacted for carbon sink potential -							195
Low - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							1,107
Low - Extend rotation length (1000							·
hectares)							
Land impacted for carbon sink potential -							8.86
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 -							48.3
Low - Increase trees outside forests							
(1000 hectares)							
Land impacted for carbon sink potential -							46.6
Low - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							50.3
Low - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							642
Low - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							2,107
Low - Total impacted (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							11.9
Mid - Accelerate regeneration (1000							
hectares)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Land impacted for carbon sink potential -							202
Mid - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							1,999
Mid - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							13.3
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 -							70
Mid - Increase trees outside forests (1000							
hectares)							
Land impacted for carbon sink potential -							69.9
Mid - Reforest cropland (1000 hectares)							• • • • • • • • • • • • • • • • • • • •
Land impacted for carbon sink potential -							363
Mid - Reforest pasture (1000 hectares)							000
Land impacted for carbon sink potential -							1,293
Mid - Restore productivity (1000							1,270
hectares)							
Land impacted for carbon sink potential -							4,022
Mid - Total impacted (over 30 years) (1000							7,022
hectares)							
Land impacted for carbon sink potential -		+	-				15.8
High - Accelerate regeneration (1000							10.0
hectares)							
Land impacted for carbon sink potential -		+					208
High - Avoid deforestation (over 30 years)							200
(1000 hectares)							
Land impacted for carbon sink potential -							2,891
High - Extend rotation length (1000							2,071
hectares)							
Land impacted for carbon sink potential -		+					17.7
High - Improve plantations (1000							
hectares)							
Land impacted for carbon sink potential -		-					0
High - Increase retention of HWP (1000							J
hectares)							
Land impacted for carbon sink potential -		+					91.7
High - Increase trees outside forests							71.1
(1000 hectares)							
Land impacted for carbon sink potential -							93.2
High - Reforest cropland (1000 hectares)							70.2
Land impacted for carbon sink potential -							290
High - Reforest pasture (1000 hectares)							270
Land impacted for carbon sink potential -		+	+				1,061
High - Restore productivity (1000							1,001
hectares)							
Land impacted for carbon sink potential -							4,668
High - Total impacted (over 30 years)							4,000
(1000 hectares)							
(1000 Heddares)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Moderate deployment - Corn-ethanol to energy grasses (1000 tCO2e/y)							-432

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Moderate							-2,618
deployment - Cropland measures (1000							
tCO2e/y)							(70
Carbon sink potential - Moderate							-67.9
deployment - Permanent conservation							
cover (1000 tC02e/y)							0.110
Carbon sink potential - Moderate							-3,118
deployment - Total (1000 tCO2e/y)							/ 00
Carbon sink potential - Aggressive							-432
deployment - Corn-ethanol to energy							
grasses (1000 tC02e/y)							
Carbon sink potential - Aggressive							-4,963
deployment - Cropland measures (1000							
tCO2e/y)							
Carbon sink potential - Aggressive							-136
deployment - Permanent conservation							
cover (1000 tCO2e/y)							
Carbon sink potential - Aggressive							-5,532
deployment - Total (1000 tCO2e/y)							
Land impacted for carbon sink - Moderate							188
deployment - Corn-ethanol to energy							
grasses (1000 hectares)							
Land impacted for carbon sink - Moderate							1,187
deployment - Cropland measures (1000							
hectares)							
Land impacted for carbon sink - Moderate							124
deployment - Permanent conservation							
cover (1000 hectares)							
Land impacted for carbon sink - Moderate							1,498
deployment - Total (1000 hectares)							
Land impacted for carbon sink -							188
Aggressive deployment - Corn-ethanol to							
energy grasses (1000 hectares)							
Land impacted for carbon sink -							2,250
Aggressive deployment - Cropland							
measures (1000 hectares)							
Land impacted for carbon sink -							247
Aggressive deployment - Permanent							
conservation cover (1000 hectares)							
Land impacted for carbon sink -							2,685
Aggressive deployment - Total (1000							,
hectares)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Premature deaths from air pollution -		85.9	0.275	0.273	0.256	0.195	0.019
Fuel Comb - Electric Generation - Coal							
(deaths)							
Premature deaths from air pollution -		15.7	10.3	13.2	9.81	3.29	1.01
Fuel Comb - Electric Generation - Natural							
Gas (deaths)							
Premature deaths from air pollution -		138	128	96.5	55.5	25.3	10.1
Mobile - On-Road (deaths)							
Premature deaths from air pollution - Gas		12.1	10.9	8.12	4.76	2.31	1.11
Stations (deaths)							
Premature deaths from air pollution -		17.3	14.1	9.54	5.27	2.49	1.02
Fuel Comb - Residential - Natural Gas							
(deaths)							
Premature deaths from air pollution -		1.74	1.39	0.932	0.523	0.212	0.063
Fuel Comb - Residential - Oil (deaths)							

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

Table 38: E+RE- scenario - IMPACTS - Hear	•	•					
Item	2020	2025	2030	2035	2040	2045	2050
Premature deaths from air pollution -		3.11	2.77	2.09	1.34	0.676	0.283
Fuel Comb - Residential - Other (deaths)				5.40	4.00	, 50	
Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Coal (deaths)		6.36	5.87	5.42	4.99	4.52	4.04
Premature deaths from air pollution -		13.8	12.1	8.98	5.7	3.45	2.19
Fuel Comb - Comm/Institutional - Natural		15.6	12.1	0.70	5.1	5.45	2.17
Gas (deaths)							
Premature deaths from air pollution -		1.47	1.19	0.887	0.616	0.408	0.255
Fuel Comb - Comm/Institutional - Oil							
(deaths)							
Premature deaths from air pollution -		0.833	0.687	0.552	0.424	0.306	0.198
Fuel Comb - Comm/Institutional - Other (deaths)							
Premature deaths from air pollution -		2.67	1.36	1.28	1.21	1.16	1.02
Industrial Processes - Coal Mining		2.01	1.36	1.20	1.21	1.10	1.02
(deaths)							
Premature deaths from air pollution -		64.9	61.1	58.2	48	39	28.2
Industrial Processes - Oil & Gas		0	J	00.2			
Production (deaths)							
Monetary damages from air pollution -		762	2.43	2.42	2.27	1.73	0.168
Fuel Comb - Electric Generation - Coal							
(million \$2019)							
Monetary damages from air pollution -		140	91.6	117	86.9	29.1	8.96
Fuel Comb - Electric Generation - Natural							
Gas (million \$2019)							
Monetary damages from air pollution -		1,223	1,135	858	493	225	90.1
Mobile - On-Road (million \$2019)		107	0/ 7	71.0	40.0	20 E	9.87
Monetary damages from air pollution - Gas Stations (million \$2019)		107	96.7	71.9	42.2	20.5	9.87
Monetary damages from air pollution -		153	125	84.5	46.7	22	9.02
Fuel Comb - Residential - Natural Gas		133	123	04.5	40.1	22	7.02
(million \$2019)							
Monetary damages from air pollution -		15.4	12.3	8.26	4.64	1.88	0.561
Fuel Comb - Residential - Oil (million							
\$2019)							
Monetary damages from air pollution -		27.6	24.5	18.5	11.8	5.99	2.51
Fuel Comb - Residential - Other (million							
\$2019)							
Monetary damages from air pollution -		56.3	51.9	48	44.2	40	35.8
Fuel Comb - Comm/Institutional - Coal							
(million \$2019) Monetary damages from air pollution -		100	107	70.5	F0 F	20.7	10 /
Fuel Comb - Comm/Institutional - Natural		122	107	79.5	50.5	30.6	19.4
Gas (million \$2019)							
Monetary damages from air pollution -		13	10.5	7.85	5.45	3.61	2.26
Fuel Comb - Comm/Institutional - Oil			.5.5		0.10	0.0.	0
(million \$2019)							
Monetary damages from air pollution -		7.37	6.08	4.88	3.75	2.71	1.76
Fuel Comb - Comm/Institutional - Other							
(million \$2019)							
Monetary damages from air pollution -		23.5	12	11.3	10.6	10.3	8.97
Industrial Processes - Coal Mining							
(million \$2019)			F/0	F4.	101	611	
Monetary damages from air pollution -		577	542	516	426	346	250
Industrial Processes - Oil & Gas							
Production (million \$2019)							

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

Table 39: E+RE- scenario - IMPACTS - Jobs							
Item	2020	2025	2030	2035	2040	2045	2050
By economic sector - Agriculture (jobs)		102	1,689	2,290	1,413	1,242	888
By economic sector - Construction (jobs)		2,998	4,094	5,638	5,064	6,446	8,052
By economic sector - Manufacturing (jobs)		2,900	3,003	3,408	3,171	3,306	3,315
By economic sector - Mining (jobs)		3,260	2,120	1,649	1,214	962	740
By economic sector - Other (jobs)		150	171	292	290	366	459
By economic sector - Pipeline (jobs)		393	648	628	493	554	673
By economic sector - Professional (jobs)		1,855	3,054	4,648	3,726	4,977	6,078
By economic sector - Trade (jobs)		1,840	1,636	2,142	1,817	2,189	2,592
By economic sector - Utilities (jobs)		4,177	5,138	7,133	6,822	15,045	25,315
By resource sector - Biomass (jobs)		285	4,312	7,778	5,236	4,866	3,702
By resource sector - CO2 (jobs)		24.7	2,581	2,829	2,151	3,211	4,604
By resource sector - Coal (jobs)		2,973	587	504	431	384	298
By resource sector - Grid (jobs)		4,109	4,765	9,052	8,592	11,051	13,183
By resource sector - Natural Gas (jobs)		4,322	4,377	3,782	4,239	4,209	3,598
By resource sector - Nuclear (jobs)		0	0	0	0	8,633	20,291
By resource sector - Oil (jobs)		4,579	3,754	2,855	2,011	1,458	1,080
By resource sector - Solar (jobs)		642	616	624	698	744	982
By resource sector - Wind (jobs)		738	562	403	653	530	377
By education level - All sectors - High		7,492	9,506	12,309	10,463	12,101	13,536
school diploma or less (jobs)							
By education level - All sectors -		5,409	6,369	8,205	7,290	8,851	10,339
Associates degree or some college (jobs)							
By education level - All sectors -		3,769	4,427	5,662	4,863	5,863	6,773
Bachelors degree (jobs)			1 2 2 2	1.05		1100	
By education level - All sectors - Masters		887	1,093	1,435	1,217	1,498	1,751
or professional degree (jobs)		117	150	010	170	005	0/0
By education level - All sectors - Doctoral degree (jobs)		117	158	218	178	225	268
Related work experience - All sectors -		2,518	3,188	4,147	3,566	4,199	4,761
None (jobs)		2,010	0,100	7,171	0,000	7,177	4,101
Related work experience - All sectors - Up		3,454	4,432	5,840	4,934	5,745	6,447
to 1 year (jobs)		0,404	4,402	0,040	4,704	0,140	0,441
Related work experience - All sectors - 1		6,501	7,827	10,019	8,638	10,280	11,784
to 4 years (jobs)		0,001	1,021	10,017	0,000	10,200	11,101
Related work experience - All sectors - 4		4,093	4,840	6,212	5,451	6,602	7,691
to 10 years (jobs)		1,070	.,6 .6	0,2.2	3, 131	0,002	1,071
Related work experience - All sectors -		1,107	1,266	1,611	1,422	1,712	1,986
Over 10 years (jobs)		1,101	1,200	1,011	1,422	1,1 12	1,700
On-the-Job Training - All sectors - None		933	1,119	1,463	1,253	1,488	1,704
(jobs)		700	1,	1, 100	1,200	., .66	1,1.0 1
On-the-Job Training - All sectors - Up to 1		11,860	14,629	18,916	16,136	18,966	21,454
year (jobs)		,000	11,027	10,710	10,100	10,700	21, 10 1
On-the-Job Training - All sectors - 1 to 4		3,641	4,294	5,487	4,868	5,913	6,924
years (jobs)		0,0 11	.,27.	0, 101	1,000	0,710	0,721
On-the-Job Training - All sectors - 4 to 10		1,081	1,326	1,732	1,551	1,926	2,301
years (jobs)		.,001	1,020	.,. 02	1,001	1,720	2,001
On-the-Job Training - All sectors - Over 10		160	185	231	204	245	286
years (jobs)			100	20.	20.	2.10	200
On-Site or In-Plant Training - All sectors -		2,761	3,479	4,503	3,849	4,592	5,271
None (jobs)		_,	0,	.,000	5,5	.,072	0,2
On-Site or In-Plant Training - All sectors -		10,793	13,157	17,003	14,563	17,145	19,433
Up to 1 year (jobs)		.57.75	.57.51	,000	,000	,	.,,
On-Site or In-Plant Training - All sectors -		2,845	3,367	4,306	3,800	4,583	5,333
1 to 4 years (jobs)		2,0 .0	0,001	1,000	0,000	1,000	0,000
On-Site or In-Plant Training - All sectors -		1,134	1,376	1,787	1,593	1,965	2,334
4 to 10 years (jobs)		1,104	1,010	1,101	1,070	1,700	2,004
On-Site or In-Plant Training - All sectors -		141	174	229	206	253	298
Over 10 years (jobs)		171			200	200	270
Wage income - All (million \$2019)		924	1,124	1,460	1,280	1,548	1,800
7 (111111011 42017)		/47	1,147	1,700	1,200	1,040	1,000

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

Item	2020	2025	2030	2035	2040	2045	2050
Final energy use - Transportation (PJ)	426	391	344	288	236	205	193
Final energy use - Residential (PJ)	184	171	156	137	121	111	106
Final energy use - Commercial (PJ)	119	118	113	105	99.3	96.6	97
Final energy use - Industry (PJ)	382	396	409	403	409	414	415

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

Item	2020	2025	2030	2035	2040	2045	2050
Electricity distribution capital invested -		3.26	3.36	4.91	5.18	4.05	4.16
Cumulative 5-yr (billion \$2018)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Vehicle stocks - LDV – EV (1000 units)	10.4	368	726	1,977	3,229	4,229	5,229
Vehicle stocks - LDV – All others (1000 units)	4,361	4,152	3,944	2,874	1,804	1,021	237
Light-duty vehicle capital costs vs. REF - Cumulative 5-yr (million \$2018)		840	2,147	3,490	5,282	5,754	5,483
Public EV charging plugs - DC Fast (1000 units)	0.06		1.72		7.66		12.4
Public EV charging plugs - L2 (1000 units)	0.251		41.4		184		298

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

Item	2020	2025	2030	2035	2040	2045	2050
Sales of space heating units - Electric	26.6	42.5	77.8	85.8	86.2	86.1	86.1
Heat Pump (%)							
Sales of space heating units - Electric	26.5	25.4	10.6	7.34	7.19	7.29	7.32
Resistance (%)							
Sales of space heating units - Gas (%)	37.2	20.8	6.32	3.1	2.98	2.95	2.94
Sales of space heating units - Fossil (%)	9.65	11.3	5.2	3.78	3.67	3.61	3.61
Sales of water heating units - Electric	0	8.47	44.9	53	53.3	53.4	53.4
Heat Pump (%)							
Sales of water heating units - Electric	62.5	70	49.2	44.5	44.3	44.3	44.3
Resistance (%)							
Sales of water heating units - Gas Furnace	34.2	19.2	3.59	0.151	0	0	0
(%)							
Sales of water heating units - Other (%)	3.3	2.39	2.36	2.36	2.36	2.37	2.38
Sales of cooking units - Electric	76.9	81.8	96.9	99.8	100	100	100
Resistance (%)							
Sales of cooking units - Gas (%)	23.1	18.2	3.11	0.157	0	0	0
Residential HVAC investment in 2020s vs.		3.38	3.59				
REF - Cumulative 5-yr (billion \$2018)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Sales of space heating units - Electric	5.4	31	77.5	91	92.2	92.3	92.3
Heat Pump (%)							
Sales of space heating units - Electric	3.11	4.17	4.51	5.9	6.19	6.19	6.21
Resistance (%)							
Sales of space heating units - Gas (%)	76.4	60.5	17.1	3.03	1.58	1.53	1.52
Sales of space heating units - Fossil (%)	15.1	4.35	0.819	0.034	0	0	0
Sales of water heating units - Electric	0.117	10.6	55.7	65.7	66.2	66.2	66.2
Heat Pump (%)							
Sales of water heating units - Electric	4.29	9.87	28	32.1	32.3	32.2	32.3
Resistance (%)							
Sales of water heating units - Gas (%)	94.4	77.9	14.7	0.621	0	0	0
Sales of water heating units - Other (%)	1.17	1.57	1.57	1.57	1.57	1.56	1.55

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

Item	2020	2025	2030	2035	2040	2045	2050
Sales of cooking units - Electric	43.5	55.3	83.4	88.9	89.2	89.2	89.1
Resistance (%)							
Sales of cooking units - Gas (%)	56.5	44.7	16.6	11.1	10.8	10.8	10.9
Commercial HVAC investment in 2020s -		12,650	14,338				
Cumulative 5-yr (million \$2018)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Installed thermal - Coal (MW)	10,116	0	0	0	0	0	0
Installed thermal - Natural gas (MW)	7,857	7,420	7,288	9,318	10,224	15,250	13,296
Installed thermal - Nuclear (MW)	0	0	0	0	0	3,742	11,906
Installed renewables - Rooftop PV (MW)	45.2	72.8	103	147	208	288	390
Installed renewables - Solar - Base land	68.3	68.3	68.3	68.3	68.3	68.3	68.3
use assumptions (MW)							
Installed renewables - Solar -	68.4	68.4	68.4	68.4	68.4	68.4	68.4
Constrained land use assumptions (MW)							
Installed renewables - Wind - Constrained	0	0	0	0	0	0	0
land use assumptions (MW)							
Installed renewables - Offshore Wind -	0	0	0	0	0	0	0
Constrained land use assumptions (MW)							
Capital invested - Solar PV - Base (billion		0	0	0	0	0	0
\$2018)							
Capital invested - Solar PV - Constrained		0	0	0	0	0	0
(billion \$2018)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Solar - Base land use assumptions (GWh)	145	145	145	145	145	145	145
Wind - Base land use assumptions (GWh)	0	0	0	0	0	0	0
OffshoreWind - Base land use assumptions (GWh)	0	0	0	0	0	0	0
Solar - Constrained land use assumptions (GWh)	145	145	145	145	145	145	145
Wind - Constrained land use assumptions (GWh)	0	0	0	0	0	0	0
OffshoreWind - Constrained land use assumptions (GWh)	0	0	0	0	0	0	0

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Low - Accelerate							-48.5
regeneration (1000 tCO2e/y)							
Carbon sink potential - Low - Avoid							-256
deforestation (1000 tCO2e/y)							
Carbon sink potential - Low - Extend							-2,177
rotation length (1000 tCO2e/y)							
Carbon sink potential - Low - Improve							-24.5
plantations (1000 tCO2e/y)							
Carbon sink potential - Low - Increase							-1,555
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - Low - Increase							-338
trees outside forests (1000 tCO2e/y)							
Carbon sink potential - Low - Reforest							-704
cropland (1000 tCO2e/y)							
Carbon sink potential - Low - Reforest							-773
pasture (1000 tCO2e/y)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Low - Restore							-1,079
productivity (1000 tCO2e/y)							
Carbon sink potential - Low - All (not							-6,956
counting overlap) (1000 tC02e/y)							70 /
Carbon sink potential - Mid - Accelerate							-72. <i>6</i>
regeneration (1000 tCO2e/y)							00-
Carbon sink potential - Mid - Avoid							-897
deforestation (1000 tC02e/y)							0.000
Carbon sink potential - Mid - Extend							-3,923
rotation length (1000 tC02e/y)							05.0
Carbon sink potential - Mid - Improve							-35.9
plantations (1000 tC02e/y)							0.110
Carbon sink potential - Mid - Increase							-3,110
retention of HWP (1000 tCO2e/y)							/ [1
Carbon sink potential - Mid - Increase							-651
trees outside forests (1000 tC02e/y)							1.057
Carbon sink potential - Mid - Reforest							-1,057
cropland (1000 tCO2e/y)							F / OC
Carbon sink potential - Mid - Reforest							-5,490
pasture (1000 tC02e/y)							0.100
Carbon sink potential - Mid - Restore							-2,139
productivity (1000 tCO2e/y)							17.07/
Carbon sink potential - Mid - All (not							-17,376
counting overlap) (1000 tC02e/y)							0/-
Carbon sink potential - High - Accelerate							-96.7
regeneration (1000 tCO2e/y)							4 505
Carbon sink potential - High - Avoid							-1,537
deforestation (1000 tC02e/y)							· · ·
Carbon sink potential - High - Extend							-5,669
rotation length (1000 tC02e/y)							
Carbon sink potential - High - Improve							-48.1
plantations (1000 tCO2e/y)							
Carbon sink potential - High - Increase							-4,665
retention of HWP (1000 tC02e/y)							
Carbon sink potential - High - Increase							-965
trees outside forests (1000 tC02e/y)							
Carbon sink potential - High - Reforest							-1,409
cropland (1000 tCO2e/y)							
Carbon sink potential - High - Reforest							-10,207
pasture (1000 tC02e/y)							
Carbon sink potential - High - All (not							-27,796
counting overlap) (1000 tCO2e/y)							
Carbon sink potential - High - Restore							-3,200
productivity (1000 tCO2e/y)							
Land impacted for carbon sink potential -							7.91
Low - Accelerate regeneration (1000							
hectares)							
Land impacted for carbon sink potential -							195
Low - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							1,107
Low - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							8.86
Low - Improve plantations (1000							
hectares)							
Land impacted for carbon sink potential -							0
Low - Increase retention of HWP (1000							
hectares)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Land impacted for carbon sink potential - Low - Increase trees outside forests							48.3
(1000 hectares)							
Land impacted for carbon sink potential -							46.6
Low - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							50.3
Low - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							642
Low - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							2,107
Low - Total impacted (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							11.9
Mid - Accelerate regeneration (1000							
hectares)							000
Land impacted for carbon sink potential -							202
Mid - Avoid deforestation (over 30 years)							
(1000 hectares)							1,000
Land impacted for carbon sink potential -							1,999
Mid - Extend rotation length (1000							
hectares)							10.0
Land impacted for carbon sink potential -							13.3
Mid - Improve plantations (1000 hectares) Land impacted for carbon sink potential -							0
Mid - Increase retention of HWP (1000							U
hectares)							
Land impacted for carbon sink potential -							70
Mid - Increase trees outside forests (1000							70
hectares)							
Land impacted for carbon sink potential -							69.9
Mid - Reforest cropland (1000 hectares)							07.7
Land impacted for carbon sink potential -							363
Mid - Reforest pasture (1000 hectares)							000
Land impacted for carbon sink potential -							1,293
Mid - Restore productivity (1000							1,270
hectares)							
Land impacted for carbon sink potential -							4,022
Mid - Total impacted (over 30 years) (1000							•
hectares)							
Land impacted for carbon sink potential -							15.8
High - Accelerate regeneration (1000							
hectares)							
Land impacted for carbon sink potential -							208
High - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							2,891
High - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							17.7
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 -							91.7
High - Increase trees outside forests							
(1000 hectares)							
Land impacted for carbon sink potential -							93.2
High - Reforest cropland (1000 hectares)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares)							290
Land impacted for carbon sink potential - High - Restore productivity (1000 hectares)							1,061
Land impacted for carbon sink potential - High - Total impacted (over 30 years) (1000 hectares)							4,668

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Moderate							-432
deployment - Corn-ethanol to energy							
grasses (1000 tC02e/y)							
Carbon sink potential - Moderate							-2,618
deployment - Cropland measures (1000							_,0.0
tCO2e/y)							
Carbon sink potential - Moderate							-67.9
deployment - Permanent conservation							01.7
cover (1000 tC02e/y)							
Carbon sink potential - Moderate							-3,118
deployment - Total (1000 tC02e/y)							0,110
Carbon sink potential - Aggressive							-432
deployment - Corn-ethanol to energy							702
grasses (1000 tC02e/y)							
Carbon sink potential - Aggressive							-4,963
deployment - Cropland measures (1000							-4,700
tCO2e/y)							
Carbon sink potential - Aggressive							-136
deployment - Permanent conservation							-130
cover (1000 tC02e/y)							
Carbon sink potential - Aggressive							-5,532
deployment - Total (1000 tC02e/y)							-0,002
Land impacted for carbon sink - Moderate							188
deployment - Corn-ethanol to energy							100
grasses (1000 hectares)							
Land impacted for carbon sink - Moderate							1,187
							1,107
deployment - Cropland measures (1000							
hectares)							10/
Land impacted for carbon sink - Moderate							124
deployment - Permanent conservation							
cover (1000 hectares)							4 / 00
Land impacted for carbon sink - Moderate							1,498
deployment - Total (1000 hectares)							
Land impacted for carbon sink -							188
Aggressive deployment - Corn-ethanol to							
energy grasses (1000 hectares)							
Land impacted for carbon sink -							2,250
Aggressive deployment - Cropland							
measures (1000 hectares)							
Land impacted for carbon sink -							247
Aggressive deployment - Permanent							
conservation cover (1000 hectares)							
Land impacted for carbon sink -							2,685
Aggressive deployment - Total (1000							
hectares)							

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

Table 49: <i>E-B+ scenario - IMPACTS - Health</i> Item	2020	2025	2030	2035	2040	2045	2050
Premature deaths from air pollution -	2020	85.9	0.275	0.273	0.256	0.195	0.019
Fuel Comb - Electric Generation - Coal		00.7	0.210	0.210	0.200	0.170	0.017
(deaths)							
Premature deaths from air pollution -		16.3	9.35	5.14	3.22	1.62	0.626
Fuel Comb - Electric Generation - Natural					0.22		
Gas (deaths)							
Premature deaths from air pollution -		140	141	136	122	96.8	66.2
Mobile - On-Road (deaths)							
Premature deaths from air pollution - Gas		12.3	12.2	11.6	10.3	8.05	5.51
Stations (deaths)							
Premature deaths from air pollution -		17.4	15.5	13.4	10.9	8.07	5.29
Fuel Comb - Residential - Natural Gas							
(deaths)							
Premature deaths from air pollution -		1.77	1.66	1.55	1.33	0.968	0.608
Fuel Comb - Residential - Oil (deaths)							
Premature deaths from air pollution -		3.15	3.1	3	2.69	2.09	1.44
Fuel Comb - Residential - Other (deaths)							
Premature deaths from air pollution -		6.36	5.87	5.42	4.99	4.52	4.04
Fuel Comb - Comm/Institutional - Coal							
(deaths)							
Premature deaths from air pollution -		13.9	13.6	12.8	11.3	9.01	6.62
Fuel Comb - Comm/Institutional - Natural							
Gas (deaths)							
Premature deaths from air pollution -		1.48	1.31	1.15	0.967	0.779	0.606
Fuel Comb - Comm/Institutional - Oil							
(deaths)							
Premature deaths from air pollution -		0.833	0.737	0.647	0.561	0.479	0.404
Fuel Comb - Comm/Institutional - Other							
(deaths)							
Premature deaths from air pollution -		2.9	1.36	1.3	1.23	1.18	1.11
Industrial Processes - Coal Mining							
(deaths)				(7.0		- 0, (99.4
Premature deaths from air pollution -		64	56.3	47.3	40.2	34.6	23.6
Industrial Processes - Oil & Gas							
Production (deaths)		7/0	0.40	0.40	0.07	170	0.1/0
Monetary damages from air pollution -		762	2.43	2.42	2.27	1.73	0.168
Fuel Comb - Electric Generation - Coal							
(million \$2019)		1//	00.0	/	00.5	1/ 0	
Monetary damages from air pollution - Fuel Comb - Electric Generation - Natural		144	82.8	45.5	28.5	14.3	5.55
Gas (million \$2019)							
Monetary damages from air pollution -		1,243	1,249	1,211	1,086	860	589
Mobile - On-Road (million \$2019)		1,243	1,249	1,211	1,000	880	309
Monetary damages from air pollution -		109	108	103	90.9	71.3	48.8
Gas Stations (million \$2019)		109	100	103	90.9	11.5	40.0
Monetary damages from air pollution -		154	137	119	96.5	71.5	46.9
Fuel Comb - Residential - Natural Gas		154	131	119	70.5	71.5	40.7
(million \$2019)							
Monetary damages from air pollution -		15.7	14.7	13.7	11.8	8.58	5.38
Fuel Comb - Residential - Oil (million		10.1	14.1	10.1	11.0	0.50	0.00
\$2019)							
Monetary damages from air pollution -		27.9	27.4	26.6	23.8	18.5	12.8
Fuel Comb - Residential - Other (million		21.7	21.4	20.0	20.0	10.5	12.0
\$2019)							
Monetary damages from air pollution -		56.3	51.9	48	44.2	40	35.8
Fuel Comb - Comm/Institutional - Coal		00.0	0	.5	2	,0	55.0
(million \$2019)							
Monetary damages from air pollution -		123	120	114	99.8	79.8	58.6
Fuel Comb - Comm/Institutional - Natural				• • •			
Gas (million \$2019)	I .						

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

Item	2020	2025	2030	2035	2040	2045	2050
Monetary damages from air pollution -		13.1	11.6	10.2	8.56	6.9	5.37
Fuel Comb - Comm/Institutional - Oil							
(million \$2019)							
Monetary damages from air pollution -		7.37	6.52	5.73	4.96	4.24	3.58
Fuel Comb - Comm/Institutional - Other							
(million \$2019)							
Monetary damages from air pollution -		25.6	12	11.5	10.8	10.4	9.81
Industrial Processes - Coal Mining							
(million \$2019)							
Monetary damages from air pollution -		568	500	420	357	307	210
Industrial Processes - Oil & Gas							
Production (million \$2019)							

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

Table do: E B; decirario 11 11 71010 dobe							
Item	2020	2025	2030	2035	2040	2045	2050
By economic sector - Agriculture (jobs)		101	3,497	1,665	1,532	1,762	1,634
By economic sector - Construction (jobs)		3,021	4,194	4,528	4,164	4,721	5,241
By economic sector - Manufacturing		3,375	4,882	4,289	3,726	4,228	5,028
(jobs)							
By economic sector - Mining (jobs)		3,341	2,082	1,638	1,311	1,040	720
By economic sector - Other (jobs)		155	194	227	243	279	340
By economic sector - Pipeline (jobs)		382	597	563	446	500	592
By economic sector - Professional (jobs)		1,908	5,170	3,496	3,915	4,695	4,457
By economic sector - Trade (jobs)		1,894	1,992	1,861	1,964	2,067	1,844
By economic sector - Utilities (jobs)		4,249	5,062	5,434	4,964	5,442	5,909
By resource sector - Biomass (jobs)		300	9,385	5,565	6,370	8,152	7,717
By resource sector - CO2 (jobs)		24.4	2,328	2,559	1,980	2,943	4,155
By resource sector - Coal (jobs)		3,144	591	513	444	395	344
By resource sector - Grid (jobs)		4,216	5,380	6,452	5,810	6,944	7,143
By resource sector - Natural Gas (jobs)		4,293	3,601	2,869	2,933	1,842	1,365
By resource sector - Nuclear (jobs)		0	0	0	0	0	0
By resource sector - Oil (jobs)		4,622	3,964	3,411	2,926	2,277	1,445
By resource sector - Solar (jobs)		773	940	956	950	1,111	1,856
By resource sector - Wind (jobs)		1,053	1,481	1,375	852	1,073	1,739
By education level - All sectors - High		7,837	12,453	10,485	9,722	10,798	11,288
school diploma or less (jobs)		,	,	,	,	, -	,
By education level - All sectors -		5,641	7,725	7,010	6,522	7,227	7,699
Associates degree or some college (jobs)							
By education level - All sectors -		3,914	5,780	4,846	4,671	5,187	5,264
Bachelors degree (jobs)							
By education level - All sectors - Masters		915	1,475	1,185	1,168	1,312	1,311
or professional degree (jobs)							
By education level - All sectors - Doctoral		120	236	174	182	211	203
degree (jobs)							
Related work experience - All sectors -		2,620	4,096	3,501	3,285	3,649	3,803
None (jobs)							
Related work experience - All sectors - Up		3,625	6,011	4,972	4,697	5,290	5,509
to 1 year (jobs)							
Related work experience - All sectors - 1		6,770	10,009	8,527	7,992	8,826	9,145
to 4 years (jobs)							
Related work experience - All sectors - 4		4,254	5,981	5,295	4,978	5,513	5,772
to 10 years (jobs)							
Related work experience - All sectors -		1,157	1,573	1,405	1,315	1,458	1,536
Over 10 years (jobs)							
On-the-Job Training - All sectors - None		970	1,457	1,249	1,202	1,345	1,382
(jobs)							
On-the-Job Training - All sectors - Up to 1		12,399	19,368	16,172	15,256	16,983	17,556
year (jobs)							

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Table 50.	F-B+ S0	enaria -	IMPALIS -	.inns i	(continued)

Item	2020	2025	2030	2035	2040	2045	2050
On-the-Job Training - All sectors - 1 to 4 years (jobs)		3,782	5,127	4,661	4,306	4,746	5,049
On-the-Job Training - All sectors - 4 to 10 years (jobs)		1,107	1,489	1,409	1,310	1,448	1,546
On-the-Job Training - All sectors - Over 10 years (jobs)		168	228	208	192	213	231
On-Site or In-Plant Training - All sectors - None (jobs)		2,880	4,601	3,835	3,623	4,039	4,197
On-Site or In-Plant Training - All sectors - Up to 1 year (jobs)		11,277	17,227	14,539	13,700	15,239	15,782
On-Site or In-Plant Training - All sectors - 1 to 4 years (jobs)		2,959	4,074	3,668	3,392	3,740	3,966
On-Site or In-Plant Training - All sectors - 4 to 10 years (jobs)		1,162	1,563	1,466	1,371	1,514	1,603
On-Site or In-Plant Training - All sectors - Over 10 years (jobs)		146	204	192	180	202	217
Wage income - All (million \$2019)		959	1,419	1,235	1,178	1,320	1,382

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

Item	2020	2025	2030	2035	2040	2045	2050
Final energy use - Transportation (PJ)	427	394	360	333	312	287	259
Final energy use - Residential (PJ)	184	172	163	153	142	129	118
Final energy use - Commercial (PJ)	119	119	117	114	110	106	103
Final energy use - Industry (PJ)	382	396	410	408	416	420	420

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

Item	2020	2025	2030	2035	2040	2045	2050
Electricity distribution capital invested -		2.71	2.75	3.26	3.36	4.25	4.44
Cumulative 5-yr (billion \$2018)							

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

	, -	•	•				
Item	2020	2025	2030	2035	2040	2045	2050
Vehicle stocks - LDV – EV (1000 units)	8.06	113	218	706	1,193	2,271	3,349
Vehicle stocks - LDV – All others (1000	4,378	4,378	4,378	4,153	3,928	3,027	2,126
units)							
Light-duty vehicle capital costs vs. REF -		0	135	286	962	3,037	4,422
Cumulative 5-yr (million \$2018)							
Public EV charging plugs - DC Fast (1000	0.06		0.518		2.83		7.94
units)							
Public EV charging plugs - L2 (1000 units)	0.251		12.5		68		191

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

Item	2020	2025	2030	2035	2040	2045	2050
Sales of space heating units - Electric	26.6	35.6	39.7	51.4	69.2	80.7	84.7
Heat Pump (%)							
Sales of space heating units - Electric	26.5	28.2	26.4	21.5	14.1	9.46	7.83
Resistance (%)							
Sales of space heating units - Gas (%)	37.2	23.6	22	17.4	10.1	5.25	3.56
Sales of space heating units - Fossil (%)	9.65	12.5	11.9	9.77	6.6	4.55	3.88
Sales of water heating units - Electric	0	1.46	5.6	17.5	35.8	47.8	51.9
Heat Pump (%)							
Sales of water heating units - Electric	62.5	74	71.8	64.8	54.3	47.5	45.1
Resistance (%)							
Sales of water heating units - Gas Furnace	34.2	22.2	20.3	15.3	7.52	2.39	0.624
(%)							
Sales of water heating units - Other (%)	3.3	2.39	2.37	2.38	2.39	2.38	2.38

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

Item	2020	2025	2030	2035	2040	2045	2050
Sales of cooking units - Electric	76.8	77.4	79.5	85.1	92.9	97.7	99.4
Resistance (%)							
Sales of cooking units - Gas (%)	23.2	22.6	20.5	14.9	7.09	2.29	0.616
Residential HVAC investment in 2020s vs.		3.35	3.47				
REF - Cumulative 5-yr (billion \$2018)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Sales of space heating units - Electric	5.4	22.1	27.3	42.8	66.9	83.6	89.9
Heat Pump (%)							
Sales of space heating units - Electric	3.11	4.17	4.24	4.4	4.84	5.52	5.99
Resistance (%)							
Sales of space heating units - Gas (%)	76.4	68.7	63.8	49.5	26.6	10.3	3.94
Sales of space heating units - Fossil (%)	15.1	5.03	4.61	3.36	1.65	0.539	0.139
Sales of water heating units - Electric	0.117	1.95	7.08	21.8	44.5	59.3	64.4
Heat Pump (%)							
Sales of water heating units - Electric	4.29	6.36	8.3	14.3	23.5	29.4	31.5
Resistance (%)							
Sales of water heating units - Gas (%)	94.4	90.1	83.1	62.2	30.5	9.74	2.54
Sales of water heating units - Other (%)	1.17	1.57	1.57	1.57	1.57	1.56	1.55
Sales of cooking units - Electric	43.5	47.1	51.3	61.6	76.1	85	88
Resistance (%)							
Sales of cooking units - Gas (%)	56.5	52.9	48.7	38.4	23.9	15	12
Commercial HVAC investment in 2020s -		12,642	14,325				
Cumulative 5-yr (million \$2018)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Installed thermal - Coal (MW)	10,116	1,493	0	0	0	0	0
Installed thermal - Natural gas (MW)	7,895	8,691	7,445	8,410	5,666	4,674	4,549
Installed thermal - Nuclear (MW)	0	0	0	0	0	0	0
Capital invested - Biomass power plant (billion \$2018)	0	0	0	0	0	0	0
Capital invested - Biomass w/ccu allam power plant (billion \$2018)	0	0	0	0	0	0.018	0
Capital invested - Biomass w/ccu power plant (billion \$2018)	0	0	31.9	0	7.92	5.72	0

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

Item	2020	2025	2030	2035	2040	2045	2050
Biomass power plant (GWh)	0	0	0	0	0	0	0
Biomass w/ccu power plant (GWh)	0	0	35,757	35,757	44,647	51,069	51,069
Biomass w/ccu allam power plant (GWh)	0	0	0	0	0	18	18

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

Item	2020	2025	2030	2035	2040	2045	2050
Number of facilities - Power (quantity)	0	0	0	0	0	0	0
Number of facilities - Power ccu	0	0	29	29	36	40	40
(quantity)							
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	5	6
(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 - Pyrolysis (quantity)	0	0	0	0	0	0	0

Table 58: 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	0
(quantity)							
Number of facilities - Sng (quantity)	0	0	0	0	0	0	0
Number of facilities - Sng ccu (quantity)	0	0	0	0	0	0	0
Conversion capital investment -		0	29,223	0	7,265	9,733	1,101
Cumulative 5-yr (million \$2018)							
Biomass purchases (million \$2018/y)		0	2,298	2,298	2,870	3,689	3,789

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

Item	2020	2025	2030	2035	2040	2045	2050
Annual - All (MMT)		0	35.4	35.4	47.5	59.7	61.2
Annual - BECCS (MMT)		0	35.4	35.4	44.2	56.3	57.5
Annual - NGCC (MMT)		0	0	0	0	0	0.14
Annual - Cement and lime (MMT)		0	0	0	3.32	3.42	3.53
Cumulative - All (MMT)		0	35.4	70.8	118	178	239
Cumulative - BECCS (MMT)		0	35.4	70.8	115	171	229
Cumulative - NGCC (MMT)		0	0	0	0	0	0.14
Cumulative - Cement and lime (MMT)		0	0	0	3.32	6.74	10.3

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

Item	2020	2025	2030	2035	2040	2045	2050
Trunk (km)		0	275	359	442	442	442
Spur (km)		0	1,225	1,225	1,195	2,322	2,931
All (km)		0	1,500	1,584	1,637	2,764	3,373
Cumulative investment - Trunk (million \$2018)		0	1,525	2,123	2,827	2,827	2,827
Cumulative investment - Spur (million \$2018)		0	1,678	1,677	1,686	2,774	3,438
Cumulative investment - All (million \$2018)		0	3,203	3,800	4,513	5,600	6,265

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

Item	2020	2025	2030	2035	2040	2045	2050
Annual (MMT)		0	1.85	6.42	13.1	17.7	18.4
Injection wells (wells)		0	3	12	21	35	44
Resource characterization, appraisal, permitting costs (million \$2020)		45.8	201	311	311	311	311
Wells and facilities construction costs (million \$2020)		0	91.4	356	635	1,062	1,318

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Low - Accelerate							-48.5
regeneration (1000 tCO2e/y)							
Carbon sink potential - Low - Avoid							-256
deforestation (1000 tCO2e/y)							
Carbon sink potential - Low - Extend							-2,177
rotation length (1000 tCO2e/y)							
Carbon sink potential - Low - Improve							-24.5
plantations (1000 tCO2e/y)							
Carbon sink potential - Low - Increase							-1,555
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - Low - Increase							-338
trees outside forests (1000 tCO2e/y)							
Carbon sink potential - Low - Reforest							-704
cropland (1000 tCO2e/y)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Low - Reforest							-773
pasture (1000 tC02e/y)							4.070
Carbon sink potential - Low - Restore							-1,079
productivity (1000 tC02e/y)							
Carbon sink potential - Low - All (not							-6,956
counting overlap) (1000 tCO2e/y)							
Carbon sink potential - Mid - Accelerate							-72.6
regeneration (1000 tCO2e/y)							
Carbon sink potential - Mid - Avoid							-897
deforestation (1000 tCO2e/y)							
Carbon sink potential - Mid - Extend							-3,923
rotation length (1000 tCO2e/y)							
Carbon sink potential - Mid - Improve							-35.9
plantations (1000 tCO2e/y)							
Carbon sink potential - Mid - Increase							-3,110
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - Mid - Increase							-651
trees outside forests (1000 tCO2e/y)							
Carbon sink potential - Mid - Reforest							-1,057
cropland (1000 tCO2e/y)							
Carbon sink potential - Mid - Reforest							-5,490
pasture (1000 tCO2e/y)							
Carbon sink potential - Mid - Restore							-2,139
productivity (1000 tCO2e/y)							_,
Carbon sink potential - Mid - All (not							-17,376
counting overlap) (1000 tCO2e/y)							,0.0
Carbon sink potential - High - Accelerate							-96.7
regeneration (1000 tCO2e/y)							70.1
Carbon sink potential - High - Avoid							-1,537
deforestation (1000 tC02e/y)							1,001
Carbon sink potential - High - Extend							-5,669
rotation length (1000 tC02e/y)							0,007
Carbon sink potential - High - Improve							-48.1
plantations (1000 tCO2e/y)							70.1
Carbon sink potential - High - Increase							-4,665
retention of HWP (1000 tCO2e/y)							-4,003
Carbon sink potential - High - Increase							-965
trees outside forests (1000 tC02e/y)							-700
Carbon sink potential - High - Reforest							-1,409
cropland (1000 tCO2e/y)							-1,409
							-10,207
Carbon sink potential - High - Reforest							-10,207
pasture (1000 tC02e/y)							07707
Carbon sink potential - High - All (not							-27,796
counting overlap) (1000 tC02e/y)							0.000
Carbon sink potential - High - Restore							-3,200
productivity (1000 tC02e/y)							
Land impacted for carbon sink potential -							7.91
Low - Accelerate regeneration (1000							
hectares)							
Land impacted for carbon sink potential -							195
Low - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							1,107
Low - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							8.86
Low - Improve plantations (1000							
hectares)							
							0
Land impacted for carbon sink potential -							U
Land impacted for carbon sink potential - Low - Increase retention of HWP (1000 hectares)							U

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

Item	2020	2025	2030	2035	2040	2045	2050
Land impacted for carbon sink potential -							48.3
Low - Increase trees outside forests							
(1000 hectares)							
Land impacted for carbon sink potential -							46.6
Low - Reforest cropland (1000 hectares)							50.3
Land impacted for carbon sink potential -							50.3
Low - Reforest pasture (1000 hectares)							642
Land impacted for carbon sink potential - Low - Restore productivity (1000							642
hectares)							
Land impacted for carbon sink potential -							2,107
Low - Total impacted (over 30 years)							2,107
(1000 hectares)							
Land impacted for carbon sink potential -							11.9
Mid - Accelerate regeneration (1000							11.7
hectares)							
Land impacted for carbon sink potential -							202
Mid - Avoid deforestation (over 30 years)							202
(1000 hectares)							
Land impacted for carbon sink potential -							1,999
Mid - Extend rotation length (1000							1,777
hectares)							
•							10.0
Land impacted for carbon sink potential -							13.3
Mid - Improve plantations (1000 hectares)							0
Land impacted for carbon sink potential -							U
Mid - Increase retention of HWP (1000							
hectares)							70
Land impacted for carbon sink potential -							70
Mid - Increase trees outside forests (1000 hectares)							
Land impacted for carbon sink potential -							69.9
Mid - Reforest cropland (1000 hectares)							09.9
Land impacted for carbon sink potential -							363
Mid - Reforest pasture (1000 hectares)							303
Land impacted for carbon sink potential -							1,293
Mid - Restore productivity (1000							1,293
hectares)							
Land impacted for carbon sink potential -							4,022
Mid - Total impacted (over 30 years) (1000							4,022
hectares)							
Land impacted for carbon sink potential -							15.8
High - Accelerate regeneration (1000							10.0
hectares)							
Land impacted for carbon sink potential -							208
High - Avoid deforestation (over 30 years)							200
(1000 hectares)							
Land impacted for carbon sink potential -							2,891
High - Extend rotation length (1000							2,071
hectares)							
Land impacted for carbon sink potential -							17.7
High - Improve plantations (1000							11.1
hectares)							
Land impacted for carbon sink potential -							0
High - Increase retention of HWP (1000							U
hectares)							
							91.7
Land impacted for carbon sink potential -							91.7
High - Increase trees outside forests							
(1000 hectares)							93.2
Land impacted for carbon sink potential -							

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

Item	2020	2025	2030	2035	2040	2045	2050
Land impacted for carbon sink potential -							290
High - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							1,061
High - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							4,668
High - Total impacted (over 30 years)							
(1000 hectares)							

Table 63: E-B+ scenario - PILLAR 6: Land s	•		0000	0005	00/0	00/5	0050
Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Moderate							-971
deployment - Corn-ethanol to energy							
grasses (1000 tC02e/y)							
Carbon sink potential - Moderate							-2,418
deployment - Cropland measures (1000							
tC02e/y)							
Carbon sink potential - Moderate							-62.1
deployment - Permanent conservation cover (1000 tCO2e/y)							
Carbon sink potential - Moderate							0
deployment - Cropland to woody energy							·
crops (1000 tC02e/y)							
Carbon sink potential - Moderate							0
deployment - Pasture to energy crops							J
(1000 tC02e/y)							
Carbon sink potential - Moderate							-3,451
deployment - Total (1000 tC02e/y)							-3,431
Carbon sink potential - Aggressive							-971
deployment - Corn-ethanol to energy							-971
grasses (1000 tC02e/y)							/ [0/
Carbon sink potential - Aggressive							-4,584
deployment - Cropland measures (1000							
tCO2e/y)							107
Carbon sink potential - Aggressive							-124
deployment - Permanent conservation							
cover (1000 tC02e/y)							
Carbon sink potential - Aggressive							0
deployment - Cropland to woody energy							
crops (1000 tC02e/y)							
Carbon sink potential - Aggressive							0
deployment - Pasture to energy crops							
(1000 tC02e/y)							
Carbon sink potential - Aggressive							-5,680
deployment - Total (1000 tCO2e/y)							
Land impacted for carbon sink - Moderate							395
deployment - Corn-ethanol to energy							
grasses (1000 hectares)							
Land impacted for carbon sink - Moderate							1,086
deployment - Cropland measures (1000							
hectares)							
Land impacted for carbon sink - Moderate							113
deployment - Permanent conservation							
cover (1000 hectares)							
Land impacted for carbon sink - Moderate							92.2
deployment - Cropland to woody energy							
crops (1000 hectares)							
Land impacted for carbon sink - Moderate							432
deployment - Pasture to energy crops							
(1000 hectares)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Land impacted for carbon sink - Moderate							2,118
deployment - Total (1000 hectares)							
Land impacted for carbon sink -							395
Aggressive deployment - Corn-ethanol to							
energy grasses (1000 hectares)							
Land impacted for carbon sink -							5,086
Aggressive deployment - Cropland							
measures (1000 hectares)							
Land impacted for carbon sink -							226
Aggressive deployment - Permanent							
conservation cover (1000 hectares)							
Land impacted for carbon sink -							92.2
Aggressive deployment - Cropland to							
woody energy crops (1000 hectares)							
Land impacted for carbon sink -							432
Aggressive deployment - Pasture to							
energy crops (1000 hectares)							
Land impacted for carbon sink -							6,231
Aggressive deployment - Total (1000							
hectares)							

Table 64: REF scenario - IMPACTS - Health

Item	2020	2025	2030	2035	2040	2045	2050
Premature deaths from air pollution - Fuel Comb - Electric Generation - Coal (deaths)		222	159	134	121	116	113
Premature deaths from air pollution - Fuel Comb - Electric Generation - Natural Gas (deaths)		15.2	19.9	21.8	28.2	22.5	19.5
Premature deaths from air pollution - Mobile - On-Road (deaths)		140	142	145	149	152	155
Premature deaths from air pollution - Gas Stations (deaths)		12.3	12.3	12.4	12.5	12.5	12.5
Premature deaths from air pollution - Fuel Comb - Residential - Natural Gas (deaths)		17.1	15.3	13.7	12.6	12	11.5
Premature deaths from air pollution - Fuel Comb - Residential - Oil (deaths)		1.71	1.41	0.987	0.608	0.324	0.174
Premature deaths from air pollution - Fuel Comb - Residential - Other (deaths)		2.97	2.84	2.76	2.71	2.64	2.54
Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Coal (deaths)		6.64	6.42	6.22	6.03	5.76	5.45
Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Natural Gas (deaths)		14	13.5	12.2	10.7	9.79	9.65
Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Oil (deaths)		1.52	1.45	1.34	1.22	1.13	1.07
Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Other (deaths)		0.87	0.874	0.88	0.883	0.886	0.892
Premature deaths from air pollution - Industrial Processes - Coal Mining (deaths)		5.69	3.92	3.12	2.86	2.66	2.41
Premature deaths from air pollution - Industrial Processes - Oil & Gas Production (deaths)		64.3	66.1	65.9	61.4	59.4	54.2

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

Item	2020	2025	2030	2035	2040	2045	2050
Monetary damages from air pollution - Fuel Comb - Electric Generation - Coal (million \$2019)		1,971	1,411	1,189	1,069	1,026	1,006
Monetary damages from air pollution - Fuel Comb - Electric Generation - Natural Gas (million \$2019)		134	177	193	250	199	173
Monetary damages from air pollution - Mobile - On-Road (million \$2019)		1,243	1,267	1,291	1,321	1,351	1,382
Monetary damages from air pollution - Gas Stations (million \$2019)		109	109	109	110	111	111
Monetary damages from air pollution - Fuel Comb - Residential - Natural Gas (million \$2019)		152	136	121	112	106	102
Monetary damages from air pollution - Fuel Comb - Residential - Oil (million \$2019)		15.1	12.5	8.75	5.39	2.87	1.54
Monetary damages from air pollution - Fuel Comb - Residential - Other (million \$2019)		26.3	25.2	24.4	24	23.4	22.5
Monetary damages from air pollution - Fuel Comb - Comm/Institutional - Coal (million \$2019)		58.8	56.8	55.1	53.3	51	48.2
Monetary damages from air pollution - Fuel Comb - Comm/Institutional - Natural Gas (million \$2019)		124	120	108	94.7	86.6	85.4
Monetary damages from air pollution - Fuel Comb - Comm/Institutional - Oil (million \$2019)		13.5	12.9	11.9	10.8	9.97	9.47
Monetary damages from air pollution - Fuel Comb - Comm/Institutional - Other (million \$2019)		7.7	7.74	7.79	7.82	7.85	7.89
Monetary damages from air pollution - Industrial Processes - Coal Mining (million \$2019)		50.2	34.6	27.6	25.2	23.5	21.3
Monetary damages from air pollution - Industrial Processes - Oil & Gas Production (million \$2019)		571	587	585	546	528	481

Table 65: REF scenario - IMPACTS - Jobs

Item	2020	2025	2030	2035	2040	2045	2050
By economic sector - Agriculture (jobs)		98.7	94.9	94.5	88.3	88.3	90.5
By economic sector - Construction (jobs)		3,584	4,374	4,614	4,936	4,324	4,702
By economic sector - Manufacturing		2,321	2,564	2,596	2,809	2,424	2,417
(jobs)							
By economic sector - Mining (jobs)		4,857	3,444	2,650	2,007	1,672	1,365
By economic sector - Other (jobs)		176	244	262	302	260	324
By economic sector - Pipeline (jobs)		393	407	412	393	398	398
By economic sector - Professional (jobs)		2,502	2,467	2,370	2,378	1,859	1,930
By economic sector - Trade (jobs)		2,665	2,361	2,130	1,905	1,612	1,619
By economic sector - Utilities (jobs)		5,629	6,609	6,791	7,391	5,688	6,026
By resource sector - Biomass (jobs)		288	275	261	245	244	244
By resource sector - CO2 (jobs)		0	0.036	0.046	0.049	0.054	0.058
By resource sector - Coal (jobs)		6,345	3,901	3,134	1,903	1,165	974
By resource sector - Grid (jobs)		6,492	8,342	9,069	9,045	7,706	8,376
By resource sector - Natural Gas (jobs)		4,396	5,424	5,082	6,597	5,074	5,042
By resource sector - Nuclear (jobs)		0	0	0	0	0	0
By resource sector - Oil (jobs)		4,670	4,078	3,650	3,388	3,220	3,058
By resource sector - Solar (jobs)			339	470	516	595	957
By resource sector - Wind (jobs)		34.6	205	252	513	322	221

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

Table 65. KET Scenario In Acto 3005 (c							
Item	2020	2025	2030	2035	2040	2045	2050
By education level - All sectors - High		9,678	9,694	9,391	9,453	7,911	8,158
school diploma or less (jobs)							
By education level - All sectors -		6,769	7,036	6,901	7,098	5,807	6,017
Associates degree or some college (jobs)							
By education level - All sectors -		4,550	4,596	4,434	4,456	3,638	3,706
Bachelors degree (jobs)							
By education level - All sectors - Masters		1,085	1,097	1,059	1,066	862	881
or professional degree (jobs)							
By education level - All sectors - Doctoral		143	141	135	134	108	110
degree (jobs)							
Related work experience - All sectors -		3,140	3,243	3,175	3,245	2,679	2,772
None (jobs)							
Related work experience - All sectors - Up		4,444	4,422	4,267	4,277	3,571	3,678
to 1 year (jobs)							
Related work experience - All sectors - 1		8,243	8,299	8,030	8,102	6,677	6,859
to 4 years (jobs)							
Related work experience - All sectors - 4		5,058	5,222	5,102	5,213	4,272	4,405
to 10 years (jobs)							
Related work experience - All sectors -		1,340	1,378	1,344	1,370	1,127	1,157
Over 10 years (jobs)							
On-the-Job Training - All sectors - None		1,146	1,159	1,120	1,125	931	957
(jobs)							
On-the-Job Training - All sectors - Up to 1		14,961	14,989	14,479	14,555	12,041	12,353
year (jobs)							
On-the-Job Training - All sectors - 1 to 4		4,557	4,743	4,655	4,791	3,930	4,071
years (jobs)							
On-the-Job Training - All sectors - 4 to 10		1,378	1,482	1,476	1,541	1,261	1,323
years (jobs)							
On-the-Job Training - All sectors - Over 10		182	192	189	195	163	168
years (jobs)							
On-Site or In-Plant Training - All sectors -		3,363	3,456	3,367	3,428	2,816	2,902
None (jobs)							
On-Site or In-Plant Training - All sectors -		13,684	13,696	13,227	13,295	11,002	11,290
Up to 1 year (jobs)							
On-Site or In-Plant Training - All sectors -		3,575	3,696	3,620	3,710	3,053	3,159
1 to 4 years (jobs)							
On-Site or In-Plant Training - All sectors -		1,429	1,526	1,515	1,575	1,291	1,349
4 to 10 years (jobs)							
On-Site or In-Plant Training - All sectors -		173	189	190	199	163	171
Over 10 years (jobs)							
Wage income - All (million \$2019)		1,159	1,192	1,172	1,203	1,002	1,044

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

•••	,.						
Item	2020	2025	2030	2035	2040	2045	2050
Final energy use - Transportation (PJ)	426	395	363	345	346	357	372
Final energy use - Residential (PJ)	184	172	165	159	157	156	157
Final energy use - Commercial (PJ)	119	120	121	120	120	122	127
Final energy use - Industry (PJ)	382	406	427	438	455	470	488

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

	- // 1						
Item	2020	2025	2030	2035	2040	2045	2050
Electricity distribution capital invested -		3.28	3.39	4.37	4.58	4.26	4.41
Cumulative 5-yr (billion \$2018)							

Table 68: REF scenario -	DILLAD 1, Efficiency	/Flootnification	Dooidontial
Table oo. Ker Scellul io -	PILLAR I. EIIICIEIICV	7 E18CH 111CHHUH -	Residential

Item	2020	2025	2030	2035	2040	2045	2050
Sales of space heating units - Electric	24.6	48.5	49.4	50.7	51.9	53.4	55.7
Heat Pump (%)							
Sales of space heating units - Electric	27.3	23.3	22.9	22.2	21.3	19.9	17.6
Resistance (%)							
Sales of space heating units - Gas (%)	38.3	19	19.9	20	19.9	19.9	19.8
Sales of space heating units - Fossil (%)	9.89	9.17	7.81	7.09	6.94	6.85	6.89
Sales of water heating units - Electric	0	0	0	0	0	0	0
Heat Pump (%)							
Sales of water heating units - Electric	62.5	74.8	75	74.8	74.6	74.6	74.6
Resistance (%)							
Sales of water heating units - Gas Furnace	34.2	22.8	22.6	22.8	23	23	23
(%)							
Sales of water heating units - Other (%)	3.3	2.39	2.37	2.39	2.4	2.4	2.41
Sales of cooking units - Electric	76.6	76.6	76.6	76.6	76.6	76.6	76.6
Resistance (%)							
Sales of cooking units - Gas (%)	23.4	23.4	23.4	23.4	23.4	23.4	23.4
Residential HVAC investment in 2020s vs.		3.33	3.22				
REF - Cumulative 5-yr (billion \$2018)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Sales of space heating units - Electric	5.4	26.5	53.4	75.5	79.2	79.6	79.6
Heat Pump (%)							
Sales of space heating units - Electric	3.11	5.03	9.13	15	18.3	18.8	18.9
Resistance (%)							
Sales of space heating units - Gas (%)	76.4	63.9	35.2	9.15	2.46	1.58	1.52
Sales of space heating units - Fossil (%)	15.1	4.63	2.27	0.341	0.034	0	0
Sales of water heating units - Electric	0.117	0.149	0.144	0.146	0.145	0.143	0.145
Heat Pump (%)							
Sales of water heating units - Electric	4.29	5.63	5.49	5.57	5.54	5.49	5.54
Resistance (%)							
Sales of water heating units - Gas (%)	94.4	92.6	92.8	92.7	92.7	92.8	92.8
Sales of water heating units - Other (%)	1.17	1.57	1.57	1.57	1.57	1.56	1.55
Sales of cooking units - Electric	43.5	45.6	45.9	45.7	46	45.9	45.7
Resistance (%)							
Sales of cooking units - Gas (%)	56.5	54.4	54.1	54.3	54	54.1	54.3
Commercial HVAC investment in 2020s -		12,419	12,935				
Cumulative 5-yr (million \$2018)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Installed thermal - Coal (MW)	10,116	4,225	4,225	4,225	0	0	0
Installed thermal - Natural gas (MW)	7,883	8,576	12,921	13,159	17,399	15,481	17,162
Installed thermal - Nuclear (MW)	0	0	0	0	0	0	0
Installed renewables - Rooftop PV (MW)	45.2	72.8	103	147	208	288	390
Installed renewables - Solar - Base land use assumptions (MW)	68.3	68.3	68.3	68.3	68.3	68.3	68.3

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

Item	2020	2025	2030	2035	2040	2045	2050
Solar - Base land use assumptions (GWh)	145	145	145	145	145	145	145
Wind - Base land use assumptions (GWh)	0	0	0	0	0	0	0
OffshoreWind - Base land use assumptions (GWh)	0	0	0	0	0	0	0

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

			,				
Item	2020	2025	2030	2035	2040	2045	2050
Business-as-usual carbon sink - Natural uptake (Mt CO2e/y)	-13.6		-9.57				-7.76
Business-as-usual carbon sink - Retained in Hardwood Products (Mt CO2e/y)	-1.27		-2.12				-2.23
Business-as-usual carbon sink - Total (Mt CO2e/y)	-14.9		-11.7				-9.99

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

Iable 73: REF scenario - PILLAR 6: Land sii Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Low - Accelerate					20.0		-48.5
regeneration (1000 tCO2e/y)							
Carbon sink potential - Low - Avoid							-256
deforestation (1000 tCO2e/y)							
Carbon sink potential - Low - Extend							-2,177
rotation length (1000 tCO2e/y)							_,
Carbon sink potential - Low - Improve							-24.5
plantations (1000 tC02e/y)							
Carbon sink potential - Low - Increase							-1,555
retention of HWP (1000 tCO2e/y)							,
Carbon sink potential - Low - Increase							-338
trees outside forests (1000 tCO2e/y)							
Carbon sink potential - Low - Reforest							-704
cropland (1000 tCO2e/y)							
Carbon sink potential - Low - Reforest							-773
pasture (1000 tC02e/y)							
Carbon sink potential - Low - Restore							-1,079
productivity (1000 tCO2e/y)							, -
Carbon sink potential - Low - All (not							-6,956
counting overlap) (1000 tCO2e/y)							•
Carbon sink potential - Mid - Accelerate							-72.6
regeneration (1000 tCO2e/y)							
Carbon sink potential - Mid - Avoid							-897
deforestation (1000 tCO2e/y)							
Carbon sink potential - Mid - Extend							-3,923
rotation length (1000 tCO2e/y)							
Carbon sink potential - Mid - Improve							-35.9
plantations (1000 tCO2e/y)							
Carbon sink potential - Mid - Increase							-3,110
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - Mid - Increase							-651
trees outside forests (1000 tCO2e/y)							
Carbon sink potential - Mid - Reforest							-1,057
cropland (1000 tCO2e/y)							
Carbon sink potential - Mid - Reforest							-5,490
pasture (1000 tCO2e/y)							
Carbon sink potential - Mid - Restore							-2,139
productivity (1000 tCO2e/y)							
Carbon sink potential - Mid - All (not							-17,376
counting overlap) (1000 tCO2e/y)							
Carbon sink potential - High - Accelerate							-96.7
regeneration (1000 tCO2e/y)							
Carbon sink potential - High - Avoid							-1,537
deforestation (1000 tCO2e/y)							
Carbon sink potential - High - Extend							-5,669
rotation length (1000 tCO2e/y)							
Carbon sink potential - High - Improve							-48.1
plantations (1000 tCO2e/y)							
Carbon sink potential - High - Increase							-4,665
retention of HWP (1000 tCO2e/y)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - High - Increase							-965
trees outside forests (1000 tC02e/y)							
Carbon sink potential - High - Reforest							-1,409
cropland (1000 tC02e/y)							
Carbon sink potential - High - Reforest							-10,207
pasture (1000 tC02e/y)							
Carbon sink potential - High - All (not							-27,796
counting overlap) (1000 tC02e/y)							0.000
Carbon sink potential - High - Restore							-3,200
productivity (1000 tCO2e/y)							7.01
Land impacted for carbon sink potential -							7.91
Low - Accelerate regeneration (1000							
hectares) Land impacted for carbon sink potential -							195
							190
Low - Avoid deforestation (over 30 years) (1000 hectares)							
Land impacted for carbon sink potential -							1,107
Low - Extend rotation length (1000							1,101
hectares)							
Land impacted for carbon sink potential -							8.86
Low - Improve plantations (1000							0.00
hectares)							
Land impacted for carbon sink potential -							0
Low - Increase retention of HWP (1000							U
hectares)							
Land impacted for carbon sink potential -							48.3
Low - Increase trees outside forests							.0.0
(1000 hectares)							
Land impacted for carbon sink potential -							46.6
Low - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							50.3
Low - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							642
Low - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							2,107
Low - Total impacted (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							11.9
Mid - Accelerate regeneration (1000							
hectares)							
Land impacted for carbon sink potential -							202
Mid - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							1,999
Mid - Extend rotation length (1000							
hectares)							40.0
Land impacted for carbon sink potential -							13.3
Mid - Improve plantations (1000 hectares)							
Land impacted for carbon sink potential -							0
Mid - Increase retention of HWP (1000							
hectares)							70
Land impacted for carbon sink potential -							70
Mid - Increase trees outside forests (1000							
hectares)							· · · · · · · · · · · · · · · · · · ·
Land impacted for carbon sink potential -							69.9
Mid - Reforest cropland (1000 hectares)							0/0
Land impacted for carbon sink potential - Mid - Reforest pasture (1000 hectares)							363
WILL - POTOROST DOSTLING HILLIII NOCTOROSI							

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

Item	2020	2025	2030	2035	2040	2045	2050
Land impacted for carbon sink potential - Mid - Restore productivity (1000							1,293
hectares)							
Land impacted for carbon sink potential -							4,022
Mid - Total impacted (over 30 years) (1000 hectares)							
Land impacted for carbon sink potential - High - Accelerate regeneration (1000 hectares)							15.8
Land impacted for carbon sink potential - High - Avoid deforestation (over 30 years) (1000 hectares)							208
Land impacted for carbon sink potential - High - Extend rotation length (1000 hectares)							2,891
Land impacted for carbon sink potential - High - Improve plantations (1000 hectares)							17.7
Land impacted for carbon sink potential - High - Increase retention of HWP (1000 hectares)							0
Land impacted for carbon sink potential - High - Increase trees outside forests (1000 hectares)							91.7
Land impacted for carbon sink potential - High - Reforest cropland (1000 hectares)							93.2
Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares)							290
Land impacted for carbon sink potential - High - Restore productivity (1000 hectares)							1,061
Land impacted for carbon sink potential - High - Total impacted (over 30 years) (1000 hectares)							4,668