

Net-Zero America - Nevada 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:

E. Larson, C. Greig, J. Jenkins, E. Mayfield, A. Pascale, C. Zhang, J. Drossman, R. Williams, S. Pacala, R. Socolow, EJ Baik, R. Birdsey, R. Duke, R. Jones, B. Haley, E. Leslie, K. Paustian, and A. Swan, Net-Zero America: Potential Pathways, Infrastructure, and Impacts, Final Report, Princeton University, Princeton, NJ, 29 October 2021. Report available at https://net-zeroamerica.princeton.edu.

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Table 1: E+ scenario - IMPACTS - Health

Item	2020	2025	2030	2035	2040	2045	2050
Premature deaths from air pollution -		5.62	0.008	0.008	0.005	0.003	0
Fuel Comb - Electric Generation - Coal							-
(deaths)							
Premature deaths from air pollution -		4.59	2.44	2.09	1.96	1.32	0.543
Fuel Comb - Electric Generation - Natural				,			
Gas (deaths)							
Premature deaths from air pollution -		53.2	52.4	41.8	25.2	11.8	4 54
Mohile - On-Road (deaths)		00.2	52.4	41.0	20.2	11.0	4.04
Dremature deaths from air pollution - Cas		3 3 2	3.00	2 5 3	155	0.75/	0 333
Statione (deathe)		0.02	0.22	2.00	1.55	0.134	0.002
Dromoture doothe from ain pollution		0.01	77/.	E 1/.	0 00	1 20	0.440
Fuel Comb. Desidential Natural Con		9.21	1.14	5.14	2.02	1.30	0.009
(dootho)							
Uted(IIS)		0.001	0.050	0.01/	0.17/	0 10 0	0.101
Freinature deaths from air poliution -		0.281	0.252	0.216	0.176	0.138	0.101
Fuel Comp - Residential - Oil (deaths)		0 5 0 0	0.507	0.40	0.017	0.010	0.150
Premature deaths from air pollution -		0.588	0.536	0.43	0.317	0.218	0.153
Fuel Comb - Residential - Other (deaths)			0.055	0.05(0.05/	0.05/	
Premature deaths from air pollution -		0.054	0.055	0.056	0.056	0.056	0.055
Fuel Comb - Comm/Institutional - Coal							
[deaths]							
Premature deaths from air pollution -		13.2	12	9.17	5.87	3.37	1.77
Fuel Comb - Comm/Institutional - Natural							
Gas (deaths)							
Premature deaths from air pollution -		1.8	1.53	1.27	1.01	0.762	0.516
Fuel Comb - Comm/Institutional - Oil							
(deaths)							
Premature deaths from air pollution -		0.798	0.704	0.604	0.495	0.379	0.259
Fuel Comb - Comm/Institutional - Other							
(deaths)							
Premature deaths from air pollution -		0.085	0.012	0.012	0.011	0.011	0.011
Industrial Processes - Coal Mining							
(deaths)							
Premature deaths from air pollution -		11.7	11.6	11.1	9.08	7.01	4.53
Industrial Processes - Oil & Gas			-			_	
Production (deaths)							
Monetary damages from air pollution -		49.8	0.067	0.067	0.044	0.027	0
Fuel Comb - Electric Generation - Coal			0.001	0.001	0.011	0.02.	C C
(million \$2019)							
Monetary damages from air pollution -		407	21.6	18 5	17.4	11.7	4 81
Fuel Comb - Electric Generation - Natural		40.1	21.0	10.0			4.01
Gas (million \$2019)							
Monetary damages from air pollution -		/.73	466	372	22/1	105	//0.3
Mohile - On-Pood (million \$2010)		413	400	512	224	100	40.5
Monetary damages from air pollution -		20 /	28.5	22 /	12.7	6.68	2 0/.
Cos Stations (million \$2010)		27.4	20.5	22.4	13.7	0.00	2.74
Manatany damagaa from ain pollution		017	60.6	/ E E	25	10.0	E 02
Fuel Comb. Decidential Natural Con		01.1	00.0	45.5	25	12.2	5.95
(million \$2010)							
(IIIIIII0II \$2019) Manatany domagos from air pollution		0 (0	0.00	1.01	1 5 /	1.00	0.000
Mulletary utiliages from all pollution -		2.49	2.23	1.91	1.50	1.23	0.893
\$2019]		5.01	(75	0.01		1.00	
Monetary damages from air pollution -		5.21	4.75	3.81	2.81	1.93	1.36
Fuel Comb - Residential - Uther (million							
\$2019J							
Monetary damages from air pollution -		0.48	0.491	0.497	0.497	0.494	0.487
Fuel Comb - Comm/Institutional - Coal							
[million \$2019]							
Monetary damages from air pollution -		117	107	81.2	52	29.9	15.7
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 -		15.9	13.5	11.2	8.96	6.74	4.57
Fuel Comb - Comm/Institutional - Oil							
(million \$2019)							
Monetary damages from air pollution -		7.06	6.24	5.35	4.38	3.35	2.29
Fuel Comb - Comm/Institutional - Other							
(million \$2019)							
Monetary damages from air pollution -		0.753	0.107	0.105	0.098	0.096	0.097
Industrial Processes - Coal Mining							
(million \$2019)							
Monetary damages from air pollution -		104	103	98.1	80.6	62.2	40.2
Industrial Processes - Oil & Gas							
Production (million \$2019)							

Table 2: E+ scenario - IMPACTS - Jobs

Item	2020	2025	2030	2035	2040	2045	2050
By economic sector - Agriculture (jobs)		4.73	9.61	3.67	2.85	2.09	1.56
By economic sector - Construction (jobs)		5,431	5,765	12,451	12,340	11,938	13,556
By economic sector - Manufacturing		1,296	1,567	1,984	2,015	1,868	1,995
(jobs)							
By economic sector - Mining (jobs)		1,000	705	460	278	154	81.4
By economic sector - Other (jobs)		696	772	2,333	2,405	2,521	3,274
By economic sector - Pipeline (jobs)		264	236	203	156	109	61.4
By economic sector - Professional (jobs)		2,074	2,273	4,978	5,186	5,272	6,317
By economic sector - Trade (jobs)		1,562	1,600	3,390	3,520	3,642	4,528
By economic sector - Utilities (jobs)		4,265	4,911	7,774	8,993	9,094	9,702
By resource sector - Biomass (jobs)		20.3	26.5	10.5	8.58	7.64	6.65
By resource sector - CO2 (jobs)		0	116	233	232	231	61.2
By resource sector - Coal (jobs)		173	32.1	0	0	0	0
By resource sector - Grid (jobs)		6,122	7,793	13,650	15,992	16,221	18,332
By resource sector - Natural Gas (jobs)		2,984	2,544	2,232	2,373	2,272	1,564
By resource sector - Nuclear (jobs)		0	0.004	0.007	0	0	0
By resource sector - Oil (jobs)		2,072	1,639	1,165	767	485	276
By resource sector - Solar (jobs)		4,789	4,796	15,145	14,321	14,131	17,740
By resource sector - Wind (jobs)		431	892	1,142	1,201	1,251	1,537
By education level - All sectors - High		7,081	7,620	14,446	14,926	14,727	16,770
school diploma or less (jobs)							
By education level - All sectors -		5,326	5,770	10,924	11,410	11,340	12,938
Associates degree or some college (jobs)							
By education level - All sectors -		3,272	3,477	6,361	6,630	6,599	7,567
Bachelors degree (jobs)							
By education level - All sectors - Masters		800	854	1,604	1,682	1,685	1,950
or professional degree (jobs)							
By education level - All sectors - Doctoral		113	119	241	247	248	292
degree (jobs)							
Related work experience - All sectors -		2,430	2,619	4,942	5,151	5,116	5,845
None (jobs)							
Related work experience - All sectors - Up		3,291	3,544	6,858	7,066	6,986	8,019
to 1 year (jobs)							
Related work experience - All sectors - 1		5,970	6,410	11,982	12,479	12,388	14,152
to 4 years (jobs)							
Related work experience - All sectors - 4		3,899	4,188	7,817	8,139	8,070	9,183
to 10 years (jobs)							
Related work experience - All sectors -		1,002	1,079	1,978	2,061	2,040	2,317
Over 10 years (jobs)							
On-the-Job Training - All sectors - None		898	954	1,849	1,904	1,889	2,185
(jobs)							
On-the-Job Training - All sectors - Up to 1		10,694	11,495	21,501	22,357	22,182	25,387
year (jobs)							

Table 2: E+ scenario - IMPACTS - Jobs (continued)

Item	2020	2025	2030	2035	2040	2045	2050
On-the-Job Training - All sectors - 1 to 4		3,611	3,896	7,333	7,639	7,567	8,588
years (jobs)							
On-the-Job Training - All sectors - 4 to 10		1,229	1,324	2,566	2,665	2,638	2,989
years (jobs)							
On-the-Job Training - All sectors - Over 10		160	170	328	331	324	367
years (jobs)							
On-Site or In-Plant Training - All sectors -		2,655	2,846	5,436	5,623	5,577	6,401
None (jobs)							
On-Site or In-Plant Training - All sectors -		9,763	10,495	19,633	20,420	20,257	23,170
Up to 1 year (jobs)							
On-Site or In-Plant Training - All sectors -		2,789	3,008	5,661	5,893	5,837	6,633
1 to 4 years (jobs)							
On-Site or In-Plant Training - All sectors -		1,236	1,327	2,540	2,636	2,607	2,950
4 to 10 years (jobs)							
On-Site or In-Plant Training - All sectors -		150	163	307	323	320	363
Over 10 years (jobs)							
Wage income - All (million \$2019)		932	1,011	1,893	2,001	2,012	2,320

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

Item	2020	2025	2030	2035	2040	2045	2050
Oil consumption - Annual (million bbls)		44.9	38.5	29.3	20.6	13.8	8.32
Oil consumption - Cumulative (million							906
bbls)							
Oil production - Annual (million bbls)		0.33	0.332	0.331	0.262	0.213	0.142
Natural gas consumption - Annual (tcf)		232	196	157	118	74.3	51.5
Natural gas consumption - Cumulative							4,725
(tcf)							
Natural gas production - Annual (tcf)		0.004	0.003	0.003	0.003	0.002	0.002

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

Item	2020	2025	2030	2035	2040	2045	2050		
Final energy use - Transportation (PJ)	291	274	249	218	190	171	162		
Final energy use - Residential (PJ)	94.5	92.3	87.6	79.2	71.6	67.4	65.8		
Final energy use - Commercial (PJ)	89.2	89	85.7	80.3	75.1	72.2	71.6		
Final energy use - Industry (PJ)	73.7	73.6	72.2	72.9	75.5	77.3	79.1		

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

Item	2020	2025	2030	2035	2040	2045	2050
Electricity distribution capital invested -		2.23	2.35	3.09	3.28	3.08	3.22
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)	43.2	246	450	1,161	1,873	2,441	3,010
Vehicle stocks - LDV – All others (1000	2,510	2,390	2,270	1,654	1,038	588	137
units)							
Light-duty vehicle capital costs vs. REF -		477	1,240	1,983	3,014	3,269	3,123
Cumulative 5-yr (million \$2018)							
Public EV charging plugs - DC Fast (1000	0.256		0.746		3.11		4.99
units)							
Public EV charging plugs - L2 (1000 units)	0.619		17.9		74.7		120

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

Item	2020	2025	2030	2035	2040	2045	2050
Sales of space heating units - Electric Heat Pump (%)	9.66	27.4	68.8	88.9	91.4	91.5	91.4
Sales of space heating units - Electric Resistance (%)	13.5	20.2	10.8	6.22	5.65	5.68	5.75
Sales of space heating units - Gas (%)	74.6	49	18.5	3.73	1.9	1.81	1.81
Sales of space heating units - Fossil (%)	2.25	3.38	1.94	1.18	1.02	0.999	1.02
Sales of water heating units - Electric Heat Pump (%)	0	8.43	46.6	60.9	62.4	62.5	62.5
Sales of water heating units - Electric Resistance (%)	23.2	37.5	32.8	35.1	35.7	35.8	35.8
Sales of water heating units - Gas Furnace (%)	75.1	52.3	18.8	2.22	0.114	0	0
Sales of water heating units - Other (%)	1.72	1.82	1.81	1.8	1.78	1.78	1.78
Sales of cooking units - Electric Resistance (%)	66.4	73.5	95.5	99.8	100	100	100
Sales of cooking units - Gas (%)	33.6	26.5	4.53	0.228	0	0	0
Residential HVAC investment in 2020s vs. REF - Cumulative 5-yr (billion \$2018)		3.41	4.55				

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

Item	2020	2025	2030	2035	2040	2045	2050
Sales of space heating units - Electric	3.34	20.2	63.4	88.9	92.5	92.6	92.7
Heat Pump (%)							
Sales of space heating units - Electric	3.3	3.45	4.17	6.37	6.82	6.85	6.84
Resistance (%)							
Sales of space heating units - Gas (%)	92.4	76.1	32.4	4.78	0.723	0.51	0.507
Sales of space heating units - Fossil (%)	0.985	0.209	0.04	0.002	0	0	0
Sales of water heating units - Electric	0.03	8.12	45.4	61.3	63.2	63.3	63.3
Heat Pump (%)							
Sales of water heating units - Electric	1.46	5.07	23	34.6	36.2	36.3	36.3
Resistance (%)							
Sales of water heating units - Gas (%)	98.1	86.4	31.1	3.68	0.19	0	0
Sales of water heating units - Other (%)	0.365	0.384	0.383	0.384	0.383	0.384	0.383
Sales of cooking units - Electric	41.9	54.6	83	88.6	88.9	88.9	88.9
Resistance (%)							
Sales of cooking units - Gas (%)	58.1	45.4	17	11.4	11.1	11.1	11.1
Commercial HVAC investment in 2020s -		7,465	8,314				
Cumulative 5-yr (million \$2018)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Installed thermal - Coal (MW)	809	242	0	0	0	0	0
Installed thermal - Natural gas (MW)	6,545	5,969	6,674	7,057	8,597	6,543	4,690
Installed thermal - Nuclear (MW)	0	0	0.001	0.004	0	0	0
Installed renewables - Rooftop PV (MW)	675	1,040	1,389	1,810	2,310	2,893	3,583
Installed renewables - Solar - Base land	4,971	4,971	4,971	13,631	19,500	24,398	28,779
use assumptions (MW)							
Installed renewables - Wind - Base land	985	1,335	4,050	7,632	9,418	10,219	12,897
use assumptions (MW)							
Installed renewables - Solar -	4,880	4,965	4,965	6,533	8,473	9,843	13,638
Constrained land use assumptions (MW)							
Installed renewables - Wind - Constrained	222	437	1,128	1,610	2,374	2,417	3,217
land use assumptions (MW)							
Capital invested - Solar PV - Base (billion		0	0	9.55	6.1	4.81	4.06
\$2018)							
Capital invested - Wind - Base (billion		0.755	3.61	4.44	2.11	0.898	2.84
\$2018)							

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

				,			
Item	2020	2025	2030	2035	2040	2045	2050
Capital invested - Solar PV - Constrained (billion \$2018)		3.93	0	4.62	3.7	2.12	1.58
Capital invested - Wind - Constrained (billion \$2018)		0.262	1.01	0.429	0.94	0.089	0.787
Capital invested - Biomass power plant (billion \$2018)	0	0	0	0	0	0	0
Capital invested - Biomass w/ccu allam power plant (billion \$2018)	0	0	0	0	0	0	0
Capital invested - Biomass w/ccu power plant (billion \$2018)	0	0	0	0	0	0	0

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

Item	2020	2025	2030	2035	2040	2045	2050
Solar - Base land use assumptions (GWh)	13,021	13,021	13,021	34,562	49,077	61,165	71,940
Wind - Base land use assumptions (GWh)	2,421	3,919	11,540	21,442	26,325	28,482	35,708
OffshoreWind - Base land use	0	0	0	0	0	0	0
assumptions (GWh)							
Solar - Constrained land use assumptions	12,657	12,657	12,657	16,469	20,892	24,040	32,842
(GWh)							
Wind - Constrained land use assumptions	657	1,195	2,853	3,945	5,397	5,474	7,205
(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	0	0	0	0	0
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	0	0	0	0	0
(quantity)							
Number of facilities - Allam power w ccu	0	0	0	0	0	0	0
(quantity)							
Number of facilities - Beccs hydrogen	0	0	0	0	0	0	0
(quantity)							
Number of facilities - Diesel (quantity)	0	0	0	0	0	0	0
Number of facilities - Diesel ccu (quantity)	0	0	0	0	0	0	0
Number of facilities - Pyrolysis (quantity)	0	0	0	0	0	0	0
Number of facilities - Pyrolysis ccu	0	0	0	0	0	0	0
(quantity)							
Number of facilities - Sng (quantity)	0	0	0	0	0	0	0
Number of facilities - Sng ccu (quantity)	0	0	0	0	0	0	0
Conversion capital investment -		0	0	0	0	0	0
Cumulative 5-yr (million \$2018)							
Biomass purchases (million \$2018/y)		0	0	0	0	0	0

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

Item	2020	2025	2030	2035	2040	2045	2050
Annual - All (MMT)		0	0.01	0.03	0.05	0.04	0.03
Annual - BECCS (MMT)		0	0	0	0	0	0
Annual - NGCC (MMT)		0	0.01	0.03	0.05	0.04	0.03
Annual - Cement and lime (MMT)		0	0	0	0	0	0
Cumulative - All (MMT)		0	0.01	0.04	0.09	0.13	0.16
Cumulative - BECCS (MMT)		0	0	0	0	0	0
Cumulative - NGCC (MMT)		0	0.01	0.04	0.09	0.13	0.16
Cumulative - Cement and lime (MMT)		0	0	0	0	0	0

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

Item	2020	2025	2030	2035	2040	2045	2050
Trunk (km)		0	0	0	0	0	0
Spur (km)		0	51.1	102	102	102	102
All (km)		0	51.1	102	102	102	102
Cumulative investment - Trunk (million \$2018)		0	0	0	0	0	0
Cumulative investment - Spur (million \$2018)		0	26.6	53.3	53.4	53.4	53.3
Cumulative investment - All (million \$2018)		0	26.6	53.3	53.4	53.4	53.3

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

Item	2020	2025	2030	2035	2040	2045	2050
Annual (MMT)		0	0	0	0	0	0
Injection wells (wells)		0	0	0	0	0	0
Resource characterization, appraisal,		0	0	0	0	0	0
permitting costs (million \$2020)							
Wells and facilities construction costs		0	0	0	0	0	0
(million \$2020)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Low - Accelerate							-791
regeneration (1000 tCO2e/y)							
Carbon sink potential - Low - Avoid							-115
deforestation (1000 tCO2e/y)							
Carbon sink potential - Low - Extend							-1,806
rotation length (1000 tCO2e/y)							
Carbon sink potential - Low - Improve							-1.27
plantations (1000 tCO2e/y)							
Carbon sink potential - Low - Increase							-1.52
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - Low - Increase							-65.1
trees outside forests (1000 tCO2e/y)							
Carbon sink potential - Low - Reforest							0
cropland (1000 tCO2e/y)							
Carbon sink potential - Low - Reforest							-44.9
pasture (1000 tCO2e/y)							
Carbon sink potential - Low - Restore							-841
productivity (1000 tCO2e/y)							
Carbon sink potential - Low - All (not							-3,666
counting overlap) (1000 tCO2e/y)							
Carbon sink potential - Mid - Accelerate							-1,185
regeneration (1000 tCO2e/y)							
Carbon sink potential - Mid - Avoid							-403
deforestation (1000 tCO2e/y)							
Carbon sink potential - Mid - Extend							-3,254
rotation length (1000 tCO2e/y)							
Carbon sink potential - Mid - Improve							-1.86
plantations (1000 tCO2e/y)							
Carbon sink potential - Mid - Increase							-3.05
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - Mid - Increase							-126
trees outside forests (1000 tCO2e/y)							
Carbon sink potential - Mid - Reforest							0
cropland (1000 tCO2e/y)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Mid - Reforest							-319
pasture (1000 tCO2e/v)							_
Carbon sink notential - Mid - Restore							-1 668
productivity (1000 tC02e/y)							1,000
Carbon sink notantial Mid All (not							6 06 0
cal boll sink potential - Mid - All (not							-0,700
							1 570
Carbon sink potential - Hign - Accelerate							-1,579
regeneration (1000 tC02e/y)							
Carbon sink potential - High - Avoid							-691
deforestation (1000 tCO2e/y)							
Carbon sink potential - High - Extend							-4,703
rotation length (1000 tCO2e/y)							
Carbon sink potential - High - Improve							-2.49
plantations (1000 tCO2e/y)							
Carbon sink notential - High - Increase							-4 57
retention of HWP (1000 tC02e/v)							
Carbon sink notential - High - Increase							_186
troos outsido forosts (1000 tC020/v)							-100
Control cink notontial Uigh Defenset							
							U
Carbon sink potential - High - Reforest							-593
pasture (1000 tCO2e/y)							
Carbon sink potential - High - All (not							-10,254
counting overlap) (1000 tCO2e/y)							
Carbon sink potential - High - Restore							-2,495
productivity (1000 tCO2e/y)							
Land impacted for carbon sink notential -							129
Low - Accelerate regeneration (1000							127
hertares)							
Land impacted for carbon sink notantial							970
Land impacted for carbon Sink potential -							01.7
(1000 hastanas)							
							010
Land impacted for carbon sink potential -							919
Low - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							0.459
Low - Improve plantations (1000							
hectares)							
Land impacted for carbon sink potential -							0
Low - Increase retention of HWP (1000							
hectares)							
Land impacted for carbon sink notential -							93
Low - Increase trees outside forests							7.0
(1000 bostores)							
Lond imposted for earbon sink notantial							
Lanu impacteu for carbon sink potential -							U
Low - Reforest cropiand (1000 nectares)							
Land impacted for carbon sink potential -							2.92
Low - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							500
Low - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							1,649
Low - Total impacted (over 30 vears)							
(1000 hectares)							
Land impacted for carbon sink notential							194
Mid - Accelerate regeneration (1000							174
hertares)							
Land impacted for carbon sink potential							007
Mid Avoid defenestation (over 20 vers)							70.1
(1000 hostonos)							

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

		. ()				
Item	2020	2025	2030	2035	2040	2045	2050
Land impacted for carbon sink potential -							1,658
Mid - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							0.69
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 -							13.5
Mid - Increase trees outside forests (1000							
hectares)							
Land impacted for carbon sink potential -							0
Mid - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							21.1
Mid - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							1,008
Mid - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							2,986
Mid - Total impacted (over 30 years) (1000							
hectares)							
Land impacted for carbon sink potential -							258
High - Accelerate regeneration (1000							
hectares)							
Land impacted for carbon sink potential -							93.6
High - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							2,398
High - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							0.918
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 -							17.7
High - Increase trees outside forests							
(1000 hectares)							
Land impacted for carbon sink potential -							0
High - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							16.8
High - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							827
High - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							3,612
High - Total impacted (over 30 years)							
(1000 hectares)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Moderate							0
deployment - Corn-ethanol to energy							
grasses (1000 tCO2e/y)							
Carbon sink potential - Moderate							-114
deployment - Cropland measures (1000							
tCO2e/y)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Moderate							-0.807
deployment - Permanent conservation							
cover (1000 tCO2e/y)							
Carbon sink potential - Moderate							-115
deployment - Total (1000 tCO2e/y)							
Carbon sink potential - Aggressive							0
deployment - Corn-ethanol to energy							
grasses (1000 tCO2e/y)							
Carbon sink potential - Aggressive							-227
deployment - Cropland measures (1000							
tCO2e/y)							
Carbon sink potential - Aggressive							-1.61
deployment - Permanent conservation							
cover (1000 tCO2e/y)							
Carbon sink potential - Aggressive							-229
deployment - Total (1000 tCO2e/y)							
Land impacted for carbon sink - Moderate							0
deployment - Corn-ethanol to energy							
grasses (1000 hectares)							
Land impacted for carbon sink - Moderate							160
deployment - Cropland measures (1000							
hectares)							
Land impacted for carbon sink - Moderate							1.24
deployment - Permanent conservation							
cover (1000 hectares)							
Land impacted for carbon sink - Moderate							162
deployment - Total (1000 hectares)							
Land impacted for carbon sink -							0
Aggressive deployment - Corn-ethanol to							
energy grasses (1000 hectares)							
Land impacted for carbon sink -							319
Aggressive deployment - Cropland							
measures (1000 hectares)							
Land impacted for carbon sink -							2.48
Aggressive deployment - Permanent							
conservation cover (1000 hectares)							
Land impacted for carbon sink -							322
Aggressive deployment - Total (1000							
hectares)							

Table 17: E- scenario - IMPACTS - Health

Item	2020	2025	2030	2035	2040	2045	2050
Premature deaths from air pollution -		5.62	0.008	0.008	0.005	0.003	0
Fuel Comb - Electric Generation - Coal							
(deaths)							
Premature deaths from air pollution -		4.68	1.85	1.21	0.624	0.295	0.151
Fuel Comb - Electric Generation - Natural							
Gas (deaths)							
Premature deaths from air pollution -		54.2	57.9	59.3	55.9	46.5	33.1
Mobile - On-Road (deaths)							
Premature deaths from air pollution - Gas		3.4	3.62	3.68	3.45	2.85	2.04
Stations (deaths)							
Premature deaths from air pollution -		9.33	9.15	8.64	7.44	5.58	3.63
Fuel Comb - Residential - Natural Gas							
(deaths)							
Premature deaths from air pollution -		0.292	0.28	0.263	0.241	0.217	0.192
Fuel Comb - Residential - Oil (deaths)							
Premature deaths from air pollution -		0.596	0.618	0.631	0.598	0.507	0.402
Fuel Comb - Residential - Other (deaths)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Premature deaths from air pollution -		0.054	0.055	0.056	0.056	0.056	0.055
Fuel Comb - Comm/Institutional - Coal							
(deaths)							
Premature deaths from air pollution -		13.3	13.7	13.7	12.6	10.4	7.72
Fuel Comb - Comm/Institutional - Natural							
Gas (deaths)							
Premature deaths from air pollution -		1.8	1.64	1.49	1.34	1.2	1.05
Fuel Comb - Comm/Institutional - Oil							
(deaths)							
Premature deaths from air pollution -		0.798	0.755	0.709	0.654	0.593	0.527
Fuel Comb - Comm/Institutional - Other							
(deaths)							
Premature deaths from air pollution -		0.081	0.012	0.013	0.013	0.011	0.008
Industrial Processes - Coal Mining							
(deaths)							
Premature deaths from air pollution -		11.7	11.1	10.1	9.14	8.42	6.23
Industrial Processes - Oil & Gas							
Production (deaths)							
Monetary damages from air pollution -		49.8	0.067	0.067	0.044	0.027	0
Fuel Comb - Electric Generation - Coal							
(million \$2019)							
Monetary damages from air pollution -		41.5	16.3	10.7	5.53	2.61	1.34
Fuel Comb - Electric Generation - Natural							
Gas (million \$2019)							
Monetary damages from air pollution -		482	515	527	497	413	295
Mobile - On-Road (million \$2019)							
Monetary damages from air pollution -		30.1	32.1	32.6	30.5	25.3	18
Gas Stations (million \$2019)							
Monetary damages from air pollution -		82.7	81	76.6	66	49.4	32.2
Fuel Comb - Residential - Natural Gas							
(million \$2019)							
Monetary damages from air pollution -		2.59	2.48	2.33	2.14	1.93	1.7
Fuel Comb - Residential - Oil (million							
\$2019)							
Monetary damages from air pollution -		5.29	5.48	5.59	5.3	4.49	3.56
Fuel Comb - Residential - Other (million							
\$2019)							
Monetary damages from air pollution -		0.48	0.491	0.497	0.497	0.494	0.487
Fuel Comb - Comm/Institutional - Coal							
(million \$2019)							
Monetary damages from air pollution -		117	122	121	111	91.9	68.4
Fuel Comb - Comm/Institutional - Natural							
Gas (million \$2019)		45.0		10.0		10 (
Monetary damages from air pollution -		15.9	14.5	13.2	11.9	10.6	9.32
Fuel Comb - Comm/Institutional - Uil							
		70/		(00	F 70		
Monetary damages from air pollution -		7.06	6.69	6.28	5.79	5.25	4.67
Fuel Comp - Comm/Institutional - Other							
		0 711	0.100	0.110	0 111	0.007	0.07
Monetary damages from air pollution -		0.711	0.109	0.112	0.111	0.097	U.U <i>1</i>
(million \$2010)							
(IIIIIIIIII \$2017) Monotony domagos from sin pollution		107.	00 0	00.0	01 0	7/. 0	EE /.
Industrial Processes - Oil & Cas		104	70.0	07.3	01.2	(4.0	00.4
Production (million \$2019)							

Table 18: E- scenario - IMPACTS - Jobs

Item	2020	2025	2030	2035	2040	2045	2050
By economic sector - Agriculture (jobs)		5.76	7.39	2.82	1.81	1.64	1.58
By economic sector - Construction (jobs)		5,474	5,759	10,997	10,938	12,194	13,927

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

Item	2020	2025	2030	2035	2040	2045	2050
By economic sector - Manufacturing		1,309	1,584	1,818	1,846	2,062	2,218
(jobs)							
By economic sector - Mining (jobs)		1,007	724	526	376	257	146
By economic sector - Other (jobs)		707	780	2,027	2,143	2,586	3,307
By economic sector - Pipeline (jobs)		265	240	223	194	166	98.7
By economic sector - Professional (jobs)		2,089	2,258	4,380	4,573	5,372	6,524
By economic sector - Trade (jobs)		1,576	1,617	3,046	3,191	3,777	4,681
By economic sector - Utilities (jobs)		4,232	4,732	6,837	7,480	8,869	9,980
By resource sector - Biomass (jobs)		21.9	19.9	9.36	7.63	6.99	6.51
By resource sector - CO2 (jobs)		0	199	400	398	397	105
By resource sector - Coal (jobs)		173	32.1	0	0	0	0
By resource sector - Grid (jobs)		6,047	7,539	11,870	13,221	15,661	18,712
By resource sector - Natural Gas (jobs)		2,984	2,311	1,905	1,863	2,222	1,728
By resource sector - Nuclear (jobs)		0	0.005	0.009	0	0	0
By resource sector - Oil (jobs)		2,096	1,759	1,481	1,190	905	554
By resource sector - Solar (jobs)		4,894	4,911	13,125	12,893	14,640	17,806
By resource sector - Wind (jobs)		449	931	1,066	1,169	1,453	1,973
By education level - All sectors - High		7,114	7,570	12,846	13,164	15,029	17,340
school diploma or less (jobs)							
By education level - All sectors -		5,347	5,714	9,689	10,012	11,533	13,369
Associates degree or some college (jobs)							
By education level - All sectors -		3,286	3,453	5,680	5,863	6,750	7,853
Bachelors degree (jobs)							
By education level - All sectors - Masters		803	847	1,428	1,482	1,718	2,020
or professional degree (jobs)							
By education level - All sectors - Doctoral		114	118	214	220	254	303
degree (jobs)							
Related work experience - All sectors -		2,440	2,597	4,392	4,532	5,212	6,042
None (jobs)							
Related work experience - All sectors - Up		3,308	3,525	6,090	6,238	7,135	8,287
to 1 year (jobs)							
Related work experience - All sectors - 1		5,995	6,359	10,663	10,995	12,634	14,648
to 4 years (jobs)							
Related work experience - All sectors - 4		3,915	4,152	6,951	7,161	8,223	9,505
to 10 years (jobs)							
Related work experience - All sectors -		1,006	1,070	1,761	1,814	2,081	2,403
Over 10 years (jobs)				=			
Un-the-Job Training - All sectors - None		903	950	1,645	1,687	1,934	2,258
		107/0	11 / 15	101/0	10 700	00 (/ 0	
Un-the-Job Training - All sectors - Up to 1		10,742	11,415	19,140	19,722	22,649	26,286
year (jobs)		0 (0)	0.050	(500	(70 /	7 (0 (0.077
Un-the-Job Training - All sectors - 1 to 4		3,624	3,858	6,508	6,704	7,694	8,877
Veal's (JUDS)		1 0 0 0	1000	0.071	0.007	0.75	0.000
Un-the-Job Training - All Sectors - 4 to 10		1,233	1,309	2,271	2,334	2,675	3,082
On the Joh Training All sectors Over 10		141	170	202	207	222	201
Voars (jobs)		101	170	292	294	333	301
On Site on In Dight Training All contons		2 6 6 0	2 0 0 0	1, 920	4.042	E 407	6 6 01
Nono (joho)		2,009	2,020	4,030	4,903	5,077	0,021
On-Site or In-Diant Training - All sectors -		9.805	10 / 20	177.75	18 007	20.676	23.085
lin to 1 year (inhs)		9,000	10,420	11,410	10,001	20,010	20,700
On-Site or In-Plant Training - All sectors -		2 700	2980	5 027	5 177	5 Q/iN	6 857
1 to 4 years (inhs)		Z177	2,700	5,021	5,111	5,740	0,001
On-Site or In-Plant Training - ΔII sectors -		1 941	1,313	2 252	2,313	2 647	3 045
4 to 10 years (iobs)		1,271	1,010	2,202	2,010	2,071	0,040
On-Site or In-Plant Training - All sectors -		150	161	272	282	325	375
Over 10 vears (iobs)		.00		-12	202	520	510
Wage income - All (million \$2019)		935	1,002	1.685	1.760	2.049	2.402
			.,	.,	.,	_, , , , , ,	_,

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

Item	2020	2025	2030	2035	2040	2045	2050
Final energy use - Transportation (PJ)	291	276	258	242	229	214	195
Final energy use - Residential (PJ)	94.5	92.7	91.9	90.1	85.9	79.9	74.4
Final energy use - Commercial (PJ)	89.2	89.2	88.5	87.3	84.9	81.8	79
Final energy use - Industry (PJ)	73.7	73.6	72.4	73.5	76.5	78.3	80

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

Item	2020	2025	2030	2035	2040	2045	2050
Electricity distribution capital invested -		2	2.09	2.43	2.55	2.99	3.14
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)	33.5	93.1	153	429	705	1,317	1,928
Vehicle stocks - LDV – All others (1000	2,520	2,520	2,520	2,390	2,261	1,742	1,224
units)							
Light-duty vehicle capital costs vs. REF -		0	80.1	162	553	1,721	2,514
Cumulative 5-yr (million \$2018)							
Public EV charging plugs - DC Fast (1000	0.256		0.253		1.17		3.2
units)							
Public EV charging plugs - L2 (1000 units)	0.619		6.09		28.1		76.9

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

Item	2020	2025	2030	2035	2040	2045	2050
Sales of space heating units - Electric	9.66	20.3	25	38.9	62.1	80.4	88.2
Heat Pump (%)							
Sales of space heating units - Electric	13.5	21.8	20.6	17.6	12.4	8.21	6.44
Resistance (%)							
Sales of space heating units - Gas (%)	74.6	54.3	50.8	40.6	23.5	10.1	4.22
Sales of space heating units - Fossil (%)	2.25	3.63	3.53	2.94	1.99	1.35	1.13
Sales of water heating units - Electric	0	1.53	5.88	18.5	39	54	60.1
Heat Pump (%)							
Sales of water heating units - Electric	23.2	38.6	38.2	36.7	35.1	35	35.4
Resistance (%)							
Sales of water heating units - Gas Furnace	75.1	58	54.2	42.9	24.1	9.21	2.71
(%)							
Sales of water heating units - Other (%)	1.72	1.82	1.82	1.82	1.8	1.79	1.78
Sales of cooking units - Electric	66.2	67.1	70.2	78.4	89.7	96.7	99.1
Resistance (%)							
Sales of cooking units - Gas (%)	33.8	32.9	29.8	21.6	10.3	3.33	0.896
Residential HVAC investment in 2020s vs.		3.39	4.49				
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	3.34	13	18	32.6	57.8	78.9	88.5
Heat Pump (%)							
Sales of space heating units - Electric	3.3	3.43	3.51	3.82	4.64	5.8	6.5
Resistance (%)							
Sales of space heating units - Gas (%)	92.4	83.3	78.3	63.4	37.5	15.3	4.96
Sales of space heating units - Fossil (%)	0.985	0.242	0.226	0.167	0.082	0.026	0.007
Sales of water heating units - Electric	0.03	1.53	5.79	18.2	38.6	54.2	60.6
Heat Pump (%)							
Sales of water heating units - Electric	1.46	2.2	4.25	10.4	21	30.2	34.5
Resistance (%)							
Sales of water heating units - Gas (%)	98.1	95.9	89.6	71	39.9	15.3	4.5
Sales of water heating units - Other (%)	0.365	0.384	0.383	0.384	0.383	0.384	0.383

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

	,,						
Item	2020	2025	2030	2035	2040	2045	2050
Sales of cooking units - Electric	41.9	46.2	50.2	60.8	75.4	84.6	87.8
Resistance (%)							
Sales of cooking units - Gas (%)	58.1	53.8	49.8	39.2	24.6	15.4	12.2
Commercial HVAC investment in 2020s -		7,460	8,285				
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)	809	242	0	0	0	0	0
Installed thermal - Natural gas (MW)	6,545	5,969	6,094	6,024	5,473	4,547	3,599
Installed thermal - Nuclear (MW)	0	0	0.002	0.005	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							-791
regeneration (1000 tCO2e/y)							
Carbon sink potential - Low - Avoid							-115
deforestation (1000 tCO2e/y)							
Carbon sink potential - Low - Extend							-1,806
rotation length (1000 tCO2e/y)							
Carbon sink potential - Low - Improve							-1.27
plantations (1000 tCO2e/y)							
Carbon sink potential - Low - Increase							-1.52
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - Low - Increase							-65.1
trees outside forests (1000 tCO2e/y)							
Carbon sink potential - Low - Reforest							0
cropland (1000 tCO2e/y)							
Carbon sink potential - Low - Reforest							-44.9
pasture (1000 tCO2e/y)							
Carbon sink potential - Low - Restore							-841
productivity (1000 tC02e/y)							
Carbon sink potential - Low - All (not							-3,666
counting overlap) (1000 tc02e/y)							4405
Carbon sink potential - Mid - Accelerate							-1,185
regeneration (1000 tc02e/y)							(0 0
defense tetion (1000 ±0020 /v)							-403
Control control Mid Extend							2.05/
rotation longth (1000 tC020/y)							-3,254
Carbon sink notantial Mid Improve							1 0 4
nlantations (1000 tC02e/v)							-1.00
Carbon sink notential - Mid - Increase							-3.05
retention of HWP (1000 tC02e/v)							0.00
Carbon sink notential - Mid - Increase							-126
trees outside forests (1000 tC02e/v)							120
Carbon sink potential - Mid - Reforest							0
cropland (1000 tCO2e/v)							-
Carbon sink potential - Mid - Reforest							-319
pasture (1000 tCO2e/y)							
Carbon sink potential - Mid - Restore							-1,668
productivity (1000 tCO2e/y)							
Carbon sink potential - Mid - All (not							-6,960
counting overlap) (1000 tCO2e/y)							
Carbon sink potential - High - Accelerate							-1,579
regeneration (1000 tCO2e/y)							
Carbon sink potential - High - Avoid							-691
deforestation (1000 tCO2e/y)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink notential - High - Extend							-4703
rotation length (1000 tC02e/v)							4,100
Carbon sink notantial High Improve							2.40
plantationa (1000 ±002a/v)							-2.47
Control of the second s							4.57
Carboni Sink potential - High - Increase							-4.37
retention of HWP (1000 tC02e/y)							
Carbon sink potential - High - Increase							-186
trees outside forests (1000 tCO2e/y)							
Carbon sink potential - High - Reforest							0
cropland (1000 tCO2e/y)							
Carbon sink potential - High - Reforest							-593
pasture (1000 tCO2e/y)							
Carbon sink potential - High - All (not							-10,254
counting overlap) (1000 tCO2e/y)							
Carbon sink notential - High - Restore							-2,495
nroductivity (1000 tC02e/y)							_,
Land impacted for carbon sink notential -							129
Low - Accelerate regeneration (1000							127
hostanos)							
Lond imposted for earlier eink notential							070
Lanu impacted for carbon sink potential -							81.9
Low - Avoid deforestation (over 30 years)							
Land impacted for carbon sink potential -							919
Low - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							0.459
Low - Improve plantations (1000							
hectares)							
Land impacted for carbon sink potential -							0
Low - Increase retention of HWP (1000							
hectares							
Land impacted for carbon sink notential -							93
Low - Increase trees outside forests							10
(1000 hectares)							
Land impacted for carbon sink notantial							0
Land impacted for carbon sink potential -							0
Low - Reiorest cropianu (1000 nectares)							0.00
Land impacted for carbon sink potential -							2.92
Low - Reforest pasture (1000 nectares)							
Land impacted for carbon sink potential -							500
Low - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							1,649
Low - Total impacted (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							194
Mid - Accelerate regeneration (1000							
hectares							
Land impacted for carbon sink potential -							90.7
Mid - Avoid deforestation (over 30 years)							,
(1000 hectares)							
Land impacted for carbon sink notantial							1450
Mid Extend notation longth (1000							1,000
Land impacted for carbon sink potential -							0.69
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 -							13.5
Mid - Increase trees outside forests (1000							
hectares)							

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

		(-)				
Item	2020	2025	2030	2035	2040	2045	2050
Land impacted for carbon sink potential -							0
Mid - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							21.1
Mid - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							1,008
Mid - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							2,986
Mid - Total impacted (over 30 years) (1000							
hectares)							
Land impacted for carbon sink potential -							258
High - Accelerate regeneration (1000							
hectares)							
Land impacted for carbon sink potential -							93.6
High - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							2,398
High - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							0.918
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 -							17.7
High - Increase trees outside forests							
(1000 hectares)							
Land impacted for carbon sink potential -							0
High - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							16.8
High - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							827
High - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							3,612
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 notential - Moderate	2020	2020	2000	2000	2010	2010	0
denloyment - Corn-ethanol to energy							U
grasses (1000 tC02e/y)							
Carbon sink potential - Moderate							-114
deployment - Cropland measures (1000							
tCO2e/v)							
Carbon sink potential - Moderate							-0.807
deployment - Permanent conservation							
cover (1000 tCO2e/y)							
Carbon sink potential - Moderate							-115
deployment - Total (1000 tCO2e/y)							
Carbon sink potential - Aggressive							0
deployment - Corn-ethanol to energy							
grasses (1000 tCO2e/y)							
Carbon sink potential - Aggressive							-227
deployment - Cropland measures (1000							
tCO2e/y)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Aggressive							-1.61
deployment - Permanent conservation							
cover (1000 tCO2e/y)							
Carbon sink potential - Aggressive							-229
deployment - Total (1000 tCO2e/y)							
Land impacted for carbon sink - Moderate							0
deployment - Corn-ethanol to energy							
grasses (1000 hectares)							
Land impacted for carbon sink - Moderate							160
deployment - Cropland measures (1000							
hectares)							
Land impacted for carbon sink - Moderate							1.24
deployment - Permanent conservation							
cover (1000 hectares)							
Land impacted for carbon sink - Moderate							162
deployment - Total (1000 hectares)							
Land impacted for carbon sink -							0
Aggressive deployment - Corn-ethanol to							
energy grasses (1000 hectares)							
Land impacted for carbon sink -							319
Aggressive deployment - Cropland							
measures (1000 hectares)							
Land impacted for carbon sink -							2.48
Aggressive deployment - Permanent							
conservation cover (1000 hectares)							
Land impacted for carbon sink -							322
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 -		5.62	0.008	0.008	0.005	0.003	0
Fuel Comb - Electric Generation - Coal							
(deaths)							
Premature deaths from air pollution -		4.21	2.21	1.15	0.775	0.387	0.134
Fuel Comb - Electric Generation - Natural							
Gas (deaths)							
Premature deaths from air pollution -		53.2	52.4	41.8	25.2	11.8	4.54
Mobile - On-Road (deaths)							
Premature deaths from air pollution - Gas		3.32	3.22	2.53	1.55	0.754	0.332
Stations (deaths)							
Premature deaths from air pollution -		9.21	7.74	5.14	2.82	1.38	0.669
Fuel Comb - Residential - Natural Gas							
(deaths)							
Premature deaths from air pollution -		0.281	0.252	0.216	0.176	0.138	0.101
Fuel Comb - Residential - Oil (deaths)							
Premature deaths from air pollution -		0.588	0.536	0.43	0.317	0.218	0.153
Fuel Comb - Residential - Other (deaths)							
Premature deaths from air pollution -		0.054	0.055	0.056	0.056	0.056	0.055
Fuel Comb - Comm/Institutional - Coal							
(deaths)							
Premature deaths from air pollution -		13.2	12	9.17	5.87	3.37	1.77
Fuel Comb - Comm/Institutional - Natural							
Gas (deaths)							
Premature deaths from air pollution -		1.8	1.53	1.27	1.01	0.762	0.516
Fuel Comb - Comm/Institutional - Oil							
(deaths)							
Premature deaths from air pollution -		0.798	0.704	0.604	0.495	0.379	0.259
Fuel Comb - Comm/Institutional - Other							
(deaths)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Premature deaths from air pollution -		0.098	0.012	0.012	0.011	0.011	0.004
Industrial Processes - Coal Mining							
(deaths)							
Premature deaths from air pollution -		11.5	11.4	10.3	7.78	4.92	0.711
Industrial Processes - Oil & Gas							
Production (deaths)							
Monetary damages from air pollution -		49.8	0.067	0.067	0.044	0.027	0
Fuel Comb - Electric Generation - Coal							
(million \$2019)							
Monetary damages from air pollution -		37.3	19.5	10.2	6.87	3.43	1.19
Fuel Comb - Electric Generation - Natural							
Gas (million \$2019)							
Monetary damages from air pollution -		473	466	372	224	105	40.3
Mobile - On-Road (million \$2019)							
Monetary damages from air pollution -		29.4	28.5	22.4	13.7	6.68	2 94
Gas Stations (million \$2019)		27.1	20.0		10.11	0.00	2.7 1
Monetary damages from air pollution -		817	68.6	45.5	25	12.2	5.93
Fuel Comh - Residential - Natural Gas		0	00.0	10.0	20		0170
(million \$2019)							
Monetary damages from air pollution -		2 49	2.23	1 91	156	1 2 3	0.893
Fuel Comb - Residential - Oil (million		2.47	2.20	1.71	1.00	1.20	0.070
\$2019)							
Monetary damages from air pollution -		5 21	/, 75	3 81	2 81	193	136
Fuel Comb - Residential - Other (million		0.21	4.15	5.01	2.01	1.75	1.50
¢2019)							
Monetary damages from air pollution -		0 / 8	0 /.91	0 / 97	0 / 97	0 / 9/	0 / 87
Fuel Comb. Comm/Institutional. Coal		0.40	0.471	0.471	0.471	0.474	0.401
(million \$2010)							
Monotony damages from air pollution		117	107	01.0	E0	20.0	15.7
Fuel Comb. Comm/Institutional Natural		117	101	01.2	52	27.7	13.7
Cas (million #2010)							
Monotony domagos from sin pollution		15.0	10 F	11.0	0.07	(7)	
Monetary damages from an ponution -		15.9	13.5	11.2	0.90	0.74	4.57
(million #2010)							
		70/	(0)	F 0F	(00	0.05	0.00
Monetary damages from air pollution -		7.06	6.24	5.35	4.38	3.35	2.29
(million #0010)							
		0.0/0	0.10.0	0.10/	0.007	0.005	0.007
Monetary damages from air poliution -		0.862	0.108	0.104	0.097	0.095	0.037
Industrial Processes - Coal Mining							
		102	101	01.2			
Monetary damages from air pollution -		102	101	91.3	69	43.7	6.32
Industrial Processes - Oil & Gas							
Production (million \$2019)							

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

Item	2020	2025	2030	2035	2040	2045	2050
By economic sector - Agriculture (jobs)		4.76	9.88	3.65	2.33	1.88	1.38
By economic sector - Construction (jobs)		5,519	6,825	14,869	14,517	15,952	17,236
By economic sector - Manufacturing		1,409	1,692	2,402	2,532	2,587	3,474
(jobs)							
By economic sector - Mining (jobs)		988	687	418	224	96.3	18
By economic sector - Other (jobs)		710	1,014	2,871	2,929	3,489	4,088
By economic sector - Pipeline (jobs)		256	213	148	93.9	50.9	23.4
By economic sector - Professional (jobs)		2,120	2,687	6,021	6,217	7,202	8,218
By economic sector - Trade (jobs)		1,585	1,873	4,065	4,192	4,935	5,766
By economic sector - Utilities (jobs)		4,337	5,098	8,895	10,007	11,550	12,637
By resource sector - Biomass (jobs)		18.5	27.9	9.83	7.6	6.97	6.05
By resource sector - CO2 (jobs)		0	0	0	0	0	0
By resource sector - Coal (jobs)		173	32.1	0	0	0	0
By resource sector - Grid (jobs)		6,325	8,434	16,419	18,848	21,767	24,507

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

Item	2020	2025	2030	2035	2040	2045	2050
By resource sector - Natural Gas (jobs)		2,903	2,341	1,886	1,730	1,908	1,411
By resource sector - Nuclear (jobs)		0	0	0	0	0	0
By resource sector - Oil (jobs)		2,073	1,619	1,120	663	302	5.53
By resource sector - Solar (jobs)		4,917	6,676	18,692	17,589	19,687	22,011
By resource sector - Wind (jobs)		519	969	1,566	1,876	2,194	3,521
By education level - All sectors - High		7,226	8,618	17,093	17,427	19,522	21,815
school diploma or less (jobs)							
By education level - All sectors -		5,434	6,494	12,904	13,289	15,011	16,845
Associates degree or some college (jobs)		-		-		-	
By education level - All sectors -		3,337	3,890	7,508	7,737	8,753	9,885
Bachelors degree (jobs)				-		-	
By education level - All sectors - Masters		815	961	1,899	1,968	2,244	2,539
or professional degree (jobs)							
By education level - All sectors - Doctoral		115	138	288	293	335	378
degree (jobs)							
Related work experience - All sectors -		2,478	2,947	5,835	5,997	6,768	7,589
None (jobs)							
Related work experience - All sectors - Up		3,362	4,039	8,149	8,297	9,313	10,455
to 1 year (jobs)							
Related work experience - All sectors - 1		6,089	7,203	14,151	14,545	16,407	18,420
to 4 years (jobs)							
Related work experience - All sectors - 4		3,976	4,702	9,223	9,473	10,675	11,958
to 10 years (jobs)							
Related work experience - All sectors -		1,024	1,207	2,335	2,403	2,701	3,039
Over 10 years (jobs)							
On-the-Job Training - All sectors - None		916	1,088	2,196	2,234	2,519	2,834
(jobs)							
On-the-Job Training - All sectors - Up to 1		10,919	12,943	25,436	26,125	29,440	33,143
year (jobs)							
On-the-Job Training - All sectors - 1 to 4		3,681	4,378	8,648	8,878	9,997	11,161
years (jobs)							
On-the-Job Training - All sectors - 4 to 10		1,249	1,496	3,024	3,088	3,479	3,843
years (jobs)							
On-the-Job Training - All sectors - Over 10		164	195	389	389	431	481
years (jobs)							
On-Site or In-Plant Training - All sectors -		2,710	3,226	6,441	6,582	7,418	8,343
None (jobs)							
On-Site or In-Plant Training - All sectors -		9,965	11,813	23,218	23,849	26,873	30,228
Up to 1 year (jobs)							
On-Site or In-Plant Training - All sectors -		2,843	3,382	6,681	6,856	7,717	8,623
1 to 4 years (jobs)							
On-Site or In-Plant Training - All sectors -		1,257	1,495	2,990	3,052	3,435	3,796
4 to 10 years (jobs)							
On-Site or In-Plant Training - All sectors -		152	183	362	374	422	471
Over 10 years (jobs)							
Wage income - All (million \$2019)		950	1,132	2,230	2,325	2,658	3,016

Table 29: E+RE+	scenario - PILLAR 1:	Efficiency	/Electrificatio	n - Overview
			, ,	

Item	2020	2025	2030	2035	2040	2045	2050	
Final energy use - Transportation (PJ)	291	274	249	218	190	171	162	
Final energy use - Residential (PJ)	94.5	92.3	87.6	79.2	71.6	67.4	65.8	
Final energy use - Commercial (PJ)	89.2	89	85.7	80.3	75.1	72.2	71.6	
Final energy use - Industry (PJ)	73.7	73.6	72.2	72.9	75.5	77.3	79.1	

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

	//						
Item	2020	2025	2030	2035	2040	2045	2050
Electricity distribution capital invested -		2.23	2.35	3.09	3.28	3.08	3.22
Cumulative 5-yr (billion \$2018)							

Item	2020	2025	2030	2035	2040	2045	2050
Vehicle stocks - LDV – EV (1000 units)	43.2	246	450	1,161	1,873	2,441	3,010
Vehicle stocks - LDV – All others (1000	2,510	2,390	2,270	1,654	1,038	588	137
units)							
Light-duty vehicle capital costs vs. REF -		477	1,240	1,983	3,014	3,269	3,123
Cumulative 5-yr (million \$2018)							
Public EV charging plugs - DC Fast (1000	0.256		0.746		3.11		4.99
units)							
Public EV charging plugs - L2 (1000 units)	0.619		17.9		74.7		120

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

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

Item	2020	2025	2030	2035	2040	2045	2050
Sales of space heating units - Electric	9.66	27.4	68.8	88.9	91.4	91.5	91.4
Heat Pump (%)							
Sales of space heating units - Electric	13.5	20.2	10.8	6.22	5.65	5.68	5.75
Resistance (%)							
Sales of space heating units - Gas (%)	74.6	49	18.5	3.73	1.9	1.81	1.81
Sales of space heating units - Fossil (%)	2.25	3.38	1.94	1.18	1.02	0.999	1.02
Sales of water heating units - Electric	0	8.43	46.6	60.9	62.4	62.5	62.5
Heat Pump (%)							
Sales of water heating units - Electric	23.2	37.5	32.8	35.1	35.7	35.8	35.8
Resistance (%)							
Sales of water heating units - Gas Furnace	75.1	52.3	18.8	2.22	0.114	0	0
(%)							
Sales of water heating units - Other (%)	1.72	1.82	1.81	1.8	1.78	1.78	1.78
Sales of cooking units - Electric	66.4	73.5	95.5	99.8	100	100	100
Resistance (%)							
Sales of cooking units - Gas (%)	33.6	26.5	4.53	0.228	0	0	0
Residential HVAC investment in 2020s vs.		3.41	4.55				
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	3.34	20.2	63.4	88.9	92.5	92.6	92.7
Heat Pump (%)							
Sales of space heating units - Electric	3.3	3.45	4.17	6.37	6.82	6.85	6.84
Resistance (%)							
Sales of space heating units - Gas (%)	92.4	76.1	32.4	4.78	0.723	0.51	0.507
Sales of space heating units - Fossil (%)	0.985	0.209	0.04	0.002	0	0	0
Sales of water heating units - Electric	0.03	8.12	45.4	61.3	63.2	63.3	63.3
Heat Pump (%)							
Sales of water heating units - Electric	1.46	5.07	23	34.6	36.2	36.3	36.3
Resistance (%)							
Sales of water heating units - Gas (%)	98.1	86.4	31.1	3.68	0.19	0	0
Sales of water heating units - Other (%)	0.365	0.384	0.383	0.384	0.383	0.384	0.383
Sales of cooking units - Electric	41.9	54.6	83	88.6	88.9	88.9	88.9
Resistance (%)							
Sales of cooking units - Gas (%)	58.1	45.4	17	11.4	11.1	11.1	11.1
Commercial HVAC investment in 2020s -		7,465	8,314				
Cumulative 5-yr (million \$2018)							

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

	, achora	ing capacit	- ,				
Item	2020	2025	2030	2035	2040	2045	2050
Installed thermal - Coal (MW)	809	242	0	0	0	0	0
Installed thermal - Natural gas (MW)	6,545	5,969	6,095	6,516	6,459	5,963	3,581

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

Table 64. ETRET beenand The Entry Continued (Continued)						
2020	2025	2030	2035	2040	2045	2050
0	0	0	0	0	0	0
675	1,040	1,389	1,810	2,310	2,893	3,583
4,971	4,971	6,259	17,580	24,957	32,297	39,397
822	1,738	4,729	9,316	12,802	15,530	22,067
4,973	4,973	6,098	8,166	11,339	15,744	21,340
244	813	1,272	2,440	2,826	2,928	3,426
0	0	0	0	0	0	0
	0	1.54	12.5	7.67	7.2	6.58
	1.35	3.98	5.69	4.12	3.06	6.92
	2020 0 675 4,971 822 4,973 244 0	2020 2025 0 0 675 1,040 4,971 4,971 822 1,738 4,973 4,973 244 813 0 0 0 0 1.35	2020 2025 2030 0 0 0 675 1,040 1,389 4,971 4,971 6,259 822 1,738 4,729 4,973 4,973 6,098 244 813 1,272 0 0 0 1.35 3.98	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	2020 2025 2030 2035 2040 2045 0 0 0 0 0 0 0 675 1,040 1,389 1,810 2,310 2,893 4,971 4,971 6,259 17,580 24,957 32,297 822 1,738 4,729 9,316 12,802 15,530 4,973 4,973 6,098 8,166 11,339 15,744 244 813 1,272 2,440 2,826 2,928 0 0 0 0 0 0 1.35 3.98 5.69 4.12 3.06

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

Item	2020	2025	2030	2035	2040	2045	2050
Solar - Base land use assumptions (GWh)	13,021	13,021	16,228	44,271	62,484	80,384	97,813
Wind - Base land use assumptions (GWh)	2,421	5,086	13,422	26,074	35,514	42,609	58,960
OffshoreWind - Base land use assumptions (GWh)	0	0	0	0	0	0	0
Solar - Constrained land use assumptions (GWh)	26,042	26,042	31,596	41,365	56,454	77,211	103,659
Wind - Constrained land use assumptions (GWh)	1,314	4,057	6,274	11,021	12,636	13,105	15,221
OffshoreWind - Constrained land use assumptions (GWh)	0	0	0	0	0	0	0

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Low - Accelerate							-791
regeneration (1000 tCO2e/y)							
Carbon sink potential - Low - Avoid							-115
deforestation (1000 tCO2e/y)							
Carbon sink potential - Low - Extend							-1,806
rotation length (1000 tCO2e/y)							
Carbon sink potential - Low - Improve							-1.27
plantations (1000 tCO2e/y)							
Carbon sink potential - Low - Increase							-1.52
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - Low - Increase							-65.1
trees outside forests (1000 tCO2e/y)							
Carbon sink potential - Low - Reforest							0
cropland (1000 tCO2e/y)							
Carbon sink potential - Low - Reforest							-44.9
pasture (1000 tCO2e/y)							
Carbon sink potential - Low - Restore							-841
productivity (1000 tCO2e/y)							
Carbon sink potential - Low - All (not							-3,666
counting overlap) (1000 tCO2e/y)							
Carbon sink potential - Mid - Accelerate							-1,185
regeneration (1000 tCO2e/y)							
Carbon sink potential - Mid - Avoid							-403
deforestation (1000 tCO2e/y)							
Carbon sink potential - Mid - Extend							-3,254
rotation length (1000 tCO2e/y)							

Item Τ

Table 36: E+RE+ scenario - PILLAR 6: Land sinks	- Forests	(continued)
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Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Mid - Improve							-1.86
plantations (1000 tCO2e/y)							
Carbon sink notential - Mid - Increase							-3.05
retention of HWP (1000 \pm CO2e/y)							0.00
Carbon sink notantial Mid Increase							106
traca outsido foresta (1000 tC020 (v)							-120
Carbon sink potential - Mid - Reforest							0
cropland (1000 tCO2e/y)							
Carbon sink potential - Mid - Reforest							-319
pasture (1000 tCO2e/y)							
Carbon sink potential - Mid - Restore							-1,668
productivity (1000 tCO2e/y)							
Carbon sink notential - Mid - All (not							-6.960
counting overlan) (1000 tCO2e/v)							0,700
Carbon sink notential - High - Accelerate							_1 570
cal boll slik potential - High - Accelerate							-1,577
							(01
Carbon sink potential - High - Avolu							-691
deforestation (1000 tC02e/y)							
Carbon sink potential - High - Extend							-4,703
rotation length (1000 tCO2e/y)							
Carbon sink potential - High - Improve							-2.49
plantations (1000 tCO2e/y)							
Carbon sink notential - High - Increase							-4 57
retention of HWP (1000 tC02e/v)							
Carbon sink notantial High Increase							104
tanon outoide fenerate (1000 ±000 (v)							-100
Carbon sink potential - Hign - Reforest							U
cropland (1000 tCO2e/y)							
Carbon sink potential - High - Reforest							-593
pasture (1000 tCO2e/y)							
Carbon sink potential - High - All (not							-10,254
counting overlap) (1000 tC02e/y)							
Carbon sink potential - High - Restore							-2,495
nroductivity (1000 tC02e/v)							_,
Land impacted for carbon sink notential							120
Land impacted for carbon sink potential -							127
Low - Accelerate regeneration (1000							
Land impacted for carbon sink potential -							87.9
Low - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							919
Low - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							0.459
Low - Improve plantations (1000							
hertares)							
Land impacted for earbon sink potential							
Land impacted for carbon sink potential -							U
LOW - INCREASE RECEINCIDIT OF HWP (1000							
nectares							
Land impacted for carbon sink potential -							9.3
Low - Increase trees outside forests							
(1000 hectares)							
Land impacted for carbon sink potential -							0
Low - Reforest cropland (1000 hectares)							
Land impacted for carbon sink notential -							2.92
low - Reforest nasture (1000 hectares)							,_
Land impacted for carbon sink notential							500
Low - Destore productivity (1000							500
Low - Restore productivity (1000							
neolaresj							

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

Item	2020	2025	2030	2035	2040	2045	2050
Land impacted for carbon sink notential -	2020	2020	2000	2000	2010	2010	16/19
Low - Total impacted (over 30 years)							1,047
(1000 hostopos)							
Lond imposted for earbon sink notantial							10/
Lanu impacted for carbon sink potential -							194
Mid - Accelerate regeneration (1000							
nectares							
Land impacted for carbon sink potential -							90.7
Mid - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							1,658
Mid - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							0.69
Mid - Improve plantations (1000 hectares)							
Land impacted for carbon sink notential -							0
Mid - Increase retention of HWP (1000							0
hostanos)							
Land imported for earbon sink potential							10 5
Lanu impacteu for carbon sink potential -							13.5
Mid - Increase trees outside forests (1000							
hectaresj							
Land impacted for carbon sink potential -							0
Mid - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							21.1
Mid - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							1,008
Mid - Restore productivity (1000							-
hectares)							
Land impacted for carbon sink notential -							2 986
Mid - Total impacted (over 30 years) (1000							2,700
hootanoo)							
Lond imported for earbon sink notential							050
Land impacted for carbon sink potential -							258
Hign - Accelerate regeneration (1000							
hectaresj							
Land impacted for carbon sink potential -							93.6
High - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							2,398
High - Extend rotation length (1000							
hectares							
Land impacted for carbon sink potential -							0.918
High - Improve plantations (1000							017.10
hertares)							
Land impacted for earbor eight potential							0
Lanu inipacteu for carbon sink potentiar -							U
High - Increase recention of HWP (1000							
nectares							
Land impacted for carbon sink potential -							17.7
High - Increase trees outside forests							
(1000 hectares)							
Land impacted for carbon sink potential -							0
High - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							16.8
High - Reforest pasture (1000 hectares)							
Land impacted for carbon sink notential -							827
High - Restore productivity (1000							521
hertares)							
Land impacted for earbon cink potential							0 /10
Land impacted for Garbon Silk potential -							3,012
nigii - Tutai iiipacteu (UVEI' 30 years)							
LIDOD HECTALES							

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Moderate							0
deployment - Corn-ethanol to energy							
grasses (1000 tCO2e/y)							
Carbon sink potential - Moderate							-114
deployment - Cropland measures (1000							
tCO2e/y)							
Carbon sink potential - Moderate							-0.807
deployment - Permanent conservation							
cover (1000 tCO2e/v)							
Carbon sink potential - Moderate							-115
denlovment - Total (1000 tC02e/v)							
Carbon sink notential - Angressive							0
denloyment - Corn-ethanol to energy							Ũ
arasses (1000 tC02e/v)							
Carbon sink notential - Aggressive							
denloyment - Cronland measures (1000							-221
Carbon sink notential - Aggressive							_1.61
donloymont Donmonont conconvation							-1.01
deployment Total (1000 ±000a (v)							-229
deployment - Total (1000 tc02e/y)							0
Land Impacted for carbon SINK - Moderate							U
deployment - Corn-ethanol to energy							
grasses (1000 nectares)							
Land impacted for carbon sink - Moderate							160
deployment - Cropland measures (1000							
hectares)							
Land impacted for carbon sink - Moderate							1.24
deployment - Permanent conservation							
cover (1000 hectares)							
Land impacted for carbon sink - Moderate							162
deployment - Total (1000 hectares)							
Land impacted for carbon sink -							0
Aggressive deployment - Corn-ethanol to							
energy grasses (1000 hectares)							
Land impacted for carbon sink -							319
Aggressive deployment - Cropland							
measures (1000 hectares)							
Land impacted for carbon sink -							2.48
Aggressive deployment - Permanent							
conservation cover (1000 hectares)							
Land impacted for carbon sink -							322
Aggressive deployment - Total (1000							
hectares)							

Table 3	8. F+RF-	scenario	- IMPACTS	- Health
	0. L+NL-	366110110	- IMFAUID	- ncuitii

Item	2020	2025	2030	2035	2040	2045	2050
Premature deaths from air pollution -		5.62	0.008	0.008	0.005	0.003	0
Fuel Comb - Electric Generation - Coal							
(deaths)							
Premature deaths from air pollution -		5.27	3.23	3.28	3.87	2.54	0.573
Fuel Comb - Electric Generation - Natural							
Gas (deaths)							
Premature deaths from air pollution -		53.2	52.4	41.8	25.2	11.8	4.54
Mobile - On-Road (deaths)							
Premature deaths from air pollution - Gas		3.32	3.22	2.53	1.55	0.754	0.332
Stations (deaths)							

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

Item	2020	2025	2030	2035	20/.0	20/15	2050
Dromature deaths from air pollution	2020	0.01	77/.	5 1/.	2040	1 20	0.660
Fuel Comb. Residential Natural Cas		7.21	1.14	5.14	2.02	1.50	0.007
(dootho)							
Utduils		0.001	0.050	0.01/	0.17/	0.100	0 101
Fremature deaths from air poliution -		0.281	0.252	0.216	0.176	0.138	0.101
Fuel Comb - Residential - Uli (deaths)							
Premature deaths from air pollution -		0.588	0.536	0.43	0.317	0.218	0.153
Fuel Comb - Residential - Other (deaths)							
Premature deaths from air pollution -		0.054	0.055	0.056	0.056	0.056	0.055
Fuel Comb - Comm/Institutional - Coal							
(deaths)							
Premature deaths from air pollution -		13.2	12	9.17	5.87	3.37	1.77
Fuel Comb - Comm/Institutional - Natural							
Gas (deaths)							
Premature deaths from air pollution -		1.8	1.53	1.27	1.01	0.762	0.516
Fuel Comh - Comm/Institutional - Oil							
(deaths)							
Dremature deaths from air pollution -		0.708	0.70/	0.60/	0 / 95	0 379	0.250
Fuel Comb - Comm/Institutional - Other		0.170	0.104	0.004	0.475	0.517	0.237
(dootho)							
		0.070	0.010	0.010	0.011	0.011	0.00/
Premature deaths from air pollution -		0.073	0.012	0.012	0.011	0.011	0.004
Industrial Processes - Coal Mining							
(deaths)							
Premature deaths from air pollution -		11.9	12.2	12.6	11.3	9.93	7.77
Industrial Processes - Oil & Gas							
Production (deaths)							
Monetary damages from air pollution -		49.8	0.067	0.067	0.044	0.027	0
Fuel Comb - Electric Generation - Coal							
(million \$2019)							
Monetary damages from air pollution -		46.7	28.6	29.1	34.3	22.5	5.07
Fuel Comb - Electric Generation - Natural							
Gas (million \$2019)							
Monetary damages from air pollution -		473	466	372	224	105	40.3
Mohile - On-Road (million \$2019)				0.2			
Monetary damages from air pollution -		29.4	28.5	22.4	13.7	6.68	2 9/4
Cas Stations (million \$2019)		27.4	20.0	22.7	10.1	0.00	2.74
Monotony domagoe from ain pollution		017	69.6	/ E E	25	10.0	E 02
Monetary utiliages from all pollution -		01.1	00.0	45.5	25	12.2	0.95
(million #0010)							
				1.01	4.5.4	1.00	
Monetary damages from air pollution -		2.49	2.23	1.91	1.56	1.23	0.893
Fuel Comb - Residential - Oil (million							
\$2019]							
Monetary damages from air pollution -		5.21	4.75	3.81	2.81	1.93	1.36
Fuel Comb - Residential - Other (million							
\$2019)							
Monetary damages from air pollution -		0.48	0.491	0.497	0.497	0.494	0.487
Fuel Comb - Comm/Institutional - Coal							
(million \$2019)							
Monetary damages from air pollution -		117	107	81.2	52	29.9	15.7
Fuel Comh - Comm/Institutional - Natural				0	0=		
Gas (million \$2019)							
Monotony domagos from air pollution		15.0	12 5	11.0	9.04	671.	/. 57
Fuel Comb - Comm/Institutional Oil		10.7	13.0	11.2	0.70	0.14	4.01
(million \$2010)							
(IIIIIIUII ¢2017) Monotony domessos from ein rellytier		70/			/ 00	0.05	0.00
Munetary uamages from air pollution -		1.06	6.24	5.35	4.38	3.35	2.29
Fuel Comp - Comm/Institutional - Other							
(million \$2019)				-			
Monetary damages from air pollution -		0.645	0.106	0.105	0.098	0.096	0.036
Industrial Processes - Coal Mining							
(million \$2019)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Monetary damages from air pollution -		105	108	112	100	88.2	69
Industrial Processes - Oil & Gas							
Production (million \$2019)							

Table 37. LTRL- Scenario - IMPACIS - JODS	Table 39:	E+RE-	scenario	- IMPACTS	- Jobs
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Item	2020	2025	2030	2035	2040	2045	2050
By economic sector - Agriculture (jobs)		5.41	7.75	2.59	2.14	1.97	1.71
By economic sector - Construction (jobs)		5,699	6,696	9,480	9,443	8,434	8,797
By economic sector - Manufacturing		1,354	1,527	1,764	1,784	1,495	1,485
(jobs)							
By economic sector - Mining (jobs)		1,012	725	504	330	209	135
By economic sector - Other (jobs)		753	911	1,540	1,579	1,484	1,919
By economic sector - Pipeline (jobs)		271	264	267	235	197	129
By economic sector - Professional (jobs)		2,151	2,620	3,711	3,813	3,517	4,094
By economic sector - Trade (jobs)		1,618	1,812	2,508	2,556	2,389	2,848
By economic sector - Utilities (jobs)		4,254	5,992	7,663	8,521	8,081	8,502
By resource sector - Biomass (jobs)		18.9	19.9	8.89	7.99	7.71	7.11
By resource sector - CO2 (jobs)		0	225	452	450	448	119
By resource sector - Coal (jobs)		173	32.1	0	0	0	0
By resource sector - Grid (jobs)		6,009	8,892	12,442	14,057	12,905	12,188
By resource sector - Natural Gas (jobs)		3,080	3,563	3,223	3,368	3,514	2,679
By resource sector - Nuclear (jobs)		0	0.006	0.021	0	0	1,704
By resource sector - Oil (jobs)		2,072	1,639	1,165	767	507	348
By resource sector - Solar (jobs)		5,370	5,659	9,429	8,864	7,788	10,241
By resource sector - Wind (jobs)		396	523	720	750	635	623
By education level - All sectors - High		7,318	8,760	11,755	12,068	10,972	11,247
school diploma or less (jobs)			-	-	-		
By education level - All sectors -		5,496	6,689	8,974	9,291	8,516	8,741
Associates degree or some college (jobs)			-	-			
By education level - All sectors -		3,365	3,985	5,222	5,370	4,910	5,122
Bachelors degree (jobs)							
By education level - All sectors - Masters		822	983	1,304	1,347	1,238	1,311
or professional degree (jobs)							
By education level - All sectors - Doctoral		117	136	185	187	171	192
degree (jobs)							
Related work experience - All sectors -		2,506	3,029	4,053	4,186	3,832	3,939
None (jobs)							
Related work experience - All sectors - Up		3,408	4,060	5,493	5,624	5,107	5,328
_to1year (jobs)							
Related work experience - All sectors - 1		6,153	7,387	9,827	10,133	9,263	9,548
to 4 years (jobs)							
Related work experience - All sectors - 4		4,019	4,840	6,432	6,634	6,067	6,223
to 10 years (jobs)							
Related work experience - All sectors -		1,033	1,238	1,635	1,686	1,538	1,574
Over 10 years (jobs)							
On-the-Job Training - All sectors - None		929	1,094	1,473	1,503	1,368	1,448
(jobs)							
On-the-Job Training - All sectors - Up to 1		11,028	13,191	17,561	18,084	16,498	17,076
year (Jobs)		0.70/	(501			F 7 4 (
On-the-Job Training - All sectors - 1 to 4		3,724	4,521	6,044	6,245	5,714	5,821
years (jobs)		10/0	1 = = 0	0.100	0.170	1000	
Un-the-Job Training - All sectors - 4 to 10		1,269	1,553	2,102	2,170	1,989	2,022
Vear's (jobs)		1/7	10/	0(1	0(0	00(0//
Un-the-Job framing - All sectors - UVer IU		167	194	261	263	236	246
On-Site on In-Diant Training All sosters		<u>م / ۲</u>	3 075	1, 200	/, 501	/. 105	/, 007
None (inhs)		2,140	3,213	4,300	4,001	4,103	4,201
On-Site or In-Plant Training - All sectors -		10 066	12 052	16 051	16 536	15 0.89	15 580
Un to 1 year (inhs)		10,000	12,002	10,001	10,000	10,007	10,007

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

Item	2020	2025	2030	2035	2040	2045	2050
On-Site or In-Plant Training - All sectors -		2,876	3,483	4,657	4,809	4,397	4,487
1 to 4 years (jobs)							
On-Site or In-Plant Training - All sectors -		1,276	1,553	2,087	2,152	1,972	2,001
4 to 10 years (jobs)							
On-Site or In-Plant Training - All sectors -		154	190	256	266	244	247
Over 10 years (jobs)							
Wage income - All (million \$2019)		959	1,169	1,566	1,638	1,519	1,575

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

Item	2020	2025	2030	2035	2040	2045	2050
Final energy use - Transportation (PJ)	291	274	249	218	190	171	162
Final energy use - Residential (PJ)	94.5	92.3	87.6	79.2	71.6	67.4	65.8
Final energy use - Commercial (PJ)	89.2	89	85.7	80.3	75.1	72.2	71.6
Final energy use - Industry (PJ)	73.7	73.6	72.2	72.9	75.5	77.3	79.1

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

Item	2020	2025	2030	2035	2040	2045	2050
Electricity distribution capital invested -		2.23	2.35	3.09	3.28	3.08	3.22
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)	43.2	246	450	1,161	1,873	2,441	3,010
Vehicle stocks - LDV – All others (1000	2,510	2,390	2,270	1,654	1,038	588	137
units)							
Light-duty vehicle capital costs vs. REF -		477	1,240	1,983	3,014	3,269	3,123
Cumulative 5-yr (million \$2018)							
Public EV charging plugs - DC Fast (1000	0.256		0.746		3.11		4.99
units)							
Public EV charging plugs - L2 (1000 units)	0.619		17.9		74.7		120

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

Item	2020	2025	2030	2035	2040	2045	2050
Sales of space heating units - Electric	9.66	27.4	68.8	88.9	91.4	91.5	91.4
Heat Pump (%)							
Sales of space heating units - Electric	13.5	20.2	10.8	6.22	5.65	5.68	5.75
Resistance (%)							
Sales of space heating units - Gas (%)	74.6	49	18.5	3.73	1.9	1.81	1.81
Sales of space heating units - Fossil (%)	2.25	3.38	1.94	1.18	1.02	0.999	1.02
Sales of water heating units - Electric	0	8.43	46.6	60.9	62.4	62.5	62.5
Heat Pump (%)							
Sales of water heating units - Electric	23.2	37.5	32.8	35.1	35.7	35.8	35.8
Resistance (%)							
Sales of water heating units - Gas Furnace	75.1	52.3	18.8	2.22	0.114	0	0
(%)							
Sales of water heating units - Other (%)	1.72	1.82	1.81	1.8	1.78	1.78	1.78
Sales of cooking units - Electric	66.4	73.5	95.5	99.8	100	100	100
Resistance (%)							
Sales of cooking units - Gas (%)	33.6	26.5	4.53	0.228	0	0	0
Residential HVAC investment in 2020s vs.		3.41	4.55				
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	3.34	20.2	63.4	88.9	92.5	92.6	92.7
Heat Pump (%)							
Sales of space heating units - Electric	3.3	3.45	4.17	6.37	6.82	6.85	6.84
Resistance (%)							
Sales of space heating units - Gas (%)	92.4	76.1	32.4	4.78	0.723	0.51	0.507
Sales of space heating units - Fossil (%)	0.985	0.209	0.04	0.002	0	0	0
Sales of water heating units - Electric	0.03	8.12	45.4	61.3	63.2	63.3	63.3
Heat Pump (%)							
Sales of water heating units - Electric	1.46	5.07	23	34.6	36.2	36.3	36.3
Resistance (%)							
Sales of water heating units - Gas (%)	98.1	86.4	31.1	3.68	0.19	0	0
Sales of water heating units - Other (%)	0.365	0.384	0.383	0.384	0.383	0.384	0.383
Sales of cooking units - Electric	41.9	54.6	83	88.6	88.9	88.9	88.9
Resistance (%)							
Sales of cooking units - Gas (%)	58.1	45.4	17	11.4	11.1	11.1	11.1
Commercial HVAC investment in 2020s -		7,465	8,314				
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)	809	242	0	0	0	0	0
Installed thermal - Natural gas (MW)	6,575	6,047	11,087	12,141	12,861	11,853	9,125
Installed thermal - Nuclear (MW)	0	0	0.002	0.011	0	0	750
Installed renewables - Rooftop PV (MW)	675	1,040	1,389	1,810	2,310	2,893	3,583
Installed renewables - Solar - Base land use assumptions (MW)	4,971	5,733	6,780	10,691	13,843	15,034	15,034
Installed renewables - Wind - Base land use assumptions (MW)	672	1,169	1,806	3,801	6,015	7,122	8,751
Installed renewables - Solar - Constrained land use assumptions (MW)	4,973	5,877	6,935	8,598	9,911	10,168	10,168
Installed renewables - Wind - Constrained land use assumptions (MW)	152	259	391	1,091	1,323	1,406	2,307
Installed renewables - Offshore Wind - Constrained land use assumptions (MW)	0	0	0	0	0	0	0
Capital invested - Solar PV - Base (billion \$2018)		1.02	1.25	4.31	3.28	1.17	0
Capital invested - Wind - Base (billion \$2018)		0.732	0.847	2.48	2.62	1.24	1.86
Capital invested - Solar PV - Constrained (billion \$2018)		1.21	1.27	1.83	1.36	0.252	0
Capital invested - Wind - Constrained (billion \$2018)		0.158	0.176	0.868	0.274	0.093	0.954

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

Item	2020	2025	2030	2035	2040	2045	2050
Solar - Base land use assumptions (GWh)	13,021	14,913	17,524	27,219	34,994	37,937	37,937
Wind - Base land use assumptions (GWh)	1,971	3,423	5,281	10,860	16,962	20,030	24,862
OffshoreWind - Base land use	0	0	0	0	0	0	0
assumptions (GWh)							
Solar - Constrained land use assumptions	13,021	15,248	17,820	21,754	24,732	25,315	25,315
(GWh)							
Wind - Constrained land use assumptions	448	757	1,085	2,768	3,322	3,520	5,281
(GWh)							
OffshoreWind - Constrained land use	0	0	0	0	0	0	0
assumptions (GWh)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Low - Accelerate							-791
regeneration (1000 tCO2e/v)							
Carbon sink notential - Low - Avoid							-115
deforestation (1000 tC02e/y)							-115
Carbon sink notantial Low Extend							1 0 0 4
cal boll Sillk potential - Low - Exterio							-1,000
							1.07
Carbon sink potential - Low - Improve							-1.27
plantations (1000 tCO2e/y)							
Carbon sink potential - Low - Increase							-1.52
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - Low - Increase							-65.1
trees outside forests (1000 tCO2e/v)							
Carbon sink notential - Low - Reforest							0
cronland (1000 t $CO2e/v$)							Ū.
Carbon sink notantial Low Potonest							/./. 0
Cal boll Silk potential - Low - Reforest							-44.7
Pasture (1000 to02e/y)							0/1
Carbon sink potential - Low - Restore							-841
productivity (1000 tCO2e/y)							
Carbon sink potential - Low - All (not							-3,666
counting overlap) (1000 tCO2e/y)							
Carbon sink potential - Mid - Accelerate							-1,185
regeneration (1000 tC02e/v)							
Carbon sink notential - Mid - Avoid							-403
deforestation (1000 tC02e/y)							400
Control control Mid Extend							2.057
Carbon sink potential - Mid - Extend							-3,254
rotation length (1000 tC02e/y)							
Carbon sink potential - Mid - Improve							-1.86
plantations (1000 tCO2e/y)							
Carbon sink potential - Mid - Increase							-3.05
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - Mid - Increase							-126
trees outside forests (1000 tCO2e/v)							
Carbon sink notential - Mid - Reforest							0
$cropland (1000 \pm 0.020 \text{ M})$							0
Cropialiu (1000 (CO2e/y)							010
Carbon Sink polential - Mid - Reforest							-319
pasture (1000 tC02e/y)							
Carbon sink potential - Mid - Restore							-1,668
productivity (1000 tCO2e/y)							
Carbon sink potential - Mid - All (not							-6,960
counting overlap) (1000 tCO2e/y)							
Carbon sink potential - High - Accelerate							-1.579
regeneration (1000 tC02e/v)							.,
Carbon sink notantial High Avoid							601
defensetation (1000 ±000 c/v)							-071
							(700
Carbon sink potential - High - Extend							-4,703
rotation length (1000 tCO2e/y)							
Carbon sink potential - High - Improve							-2.49
plantations (1000 tCO2e/y)							
Carbon sink potential - High - Increase							-4.57
retention of HWP (1000 tC02e/v)							
Carbon sink notential - High - Increase							-186
trape outeide foreste (1000 +0020/v)							-100
Control on the potential High Defenses							
Carbon sink potential - High - Reforest							U
cropiand (1000 tC02e/y)							
Carbon sink potential - High - Reforest							-593
pasture (1000 tCO2e/y)							
Carbon sink potential - High - All (not							-10,254
counting overlap) (1000 tCO2e/y)							
Carbon sink potential - High - Restore							-2.495
productivity (1000 tC02e/y)							•
	1	1	1	I I I I I I I I I I I I I I I I I I I	1	1	

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 -							129
Low - Accelerate regeneration (1000							
hectares)							
Land impacted for carbon sink notential -							879
Low - Avoid deforestation (over 30 years)							01.7
(1000 bectares)							
Land impacted for earbon sink notantial							010
Lanu impacteu ior carbon sink potential -							919
nectares							
Land impacted for carbon sink potential -							0.459
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 -							9.3
Low - Increase trees outside forests							
(1000 hectares)							
Land impacted for carbon sink potential -							0
Low - Reforest cronland (1000 hectares)							•
Land impacted for carbon sink notential -							2.92
$L_{\rm ow}$ = Peforest pasture (1000 bectares)							2.72
Lond imposted for earlier sink retential							E00
Lanu impacteu ior carbon sink potential -							500
Low - Restore productivity (1000							
nectares							
Land impacted for carbon sink potential -							1,649
Low - Total impacted (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							194
Mid - Accelerate regeneration (1000							
hectares)							
Land impacted for carbon sink potential -							90.7
Mid - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							1.658
Mid - Extend rotation length (1000							.,
hectares)							
Land impacted for carbon sink notential -							0.69
Mid - Improve plantations (1000 bectares)							0.07
Land impacted for earbon sink notantial							0
Mid Inspace potentian of UND (1000							U
Milu - Increase recention of HWP (1000							
Land impacted for carbon sink potential -							13.5
Mid - Increase trees outside forests (1000							
hectaresJ							
Land impacted for carbon sink potential -							0
Mid - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							21.1
Mid - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							1,008
Mid - Restore productivity (1000							
hectares)							
Land impacted for carbon sink notential -							2 986
Mid - Total impacted (over 30 years) (1000							2,700
hectares)							
Land imported for earbon sink notantial							050
Land impacted for carbon Slifk potential -							200
nigii - Accelerate regeneration (1000							
Inculations							
Land impacted for carbon sink potential -							93.6
Hign - Avoid deforestation (over 30 years)							
(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 -							2,398
High - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							0.918
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 -							17.7
High - Increase trees outside forests							
(1000 hectares)							
Land impacted for carbon sink potential -							0
High - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							16.8
High - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							827
High - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							3,612
High - Total impacted (over 30 years)							
(1000 hectares)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Moderate							0
deployment - Corn-ethanol to energy							
grasses (1000 tCO2e/y)							
Carbon sink potential - Moderate							-114
deployment - Cropland measures (1000							
tCO2e/y)							
Carbon sink potential - Moderate							-0.807
deployment - Permanent conservation							
cover (1000 tCO2e/y)							
Carbon sink potential - Moderate							-115
deployment - Total (1000 tCO2e/y)							
Carbon sink potential - Aggressive							0
deployment - Corn-ethanol to energy							
grasses (1000 tCO2e/y)							
Carbon sink potential - Aggressive							-227
deployment - Cropland measures (1000							
tCO2e/y)							
Carbon sink potential - Aggressive							-1.61
deployment - Permanent conservation							
cover (1000 tCO2e/y)							
Carbon sink potential - Aggressive							-229
deployment - Total (1000 tCO2e/y)							
Land impacted for carbon sink - Moderate							0
deployment - Corn-ethanol to energy							
grasses (1000 hectares)							
Land impacted for carbon sink - Moderate							160
deployment - Cropland measures (1000							
hectares)							
Land impacted for carbon sink - Moderate							1.24
deployment - Permanent conservation							
cover (1000 hectares)							
Land impacted for carbon sink - Moderate							162
deployment - Total (1000 hectares)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Land impacted for carbon sink -							0
Aggressive deployment - Corn-ethanol to							
energy grasses (1000 hectares)							
Land impacted for carbon sink -							319
Aggressive deployment - Cropland							
measures (1000 hectares)							
Land impacted for carbon sink -							2.48
Aggressive deployment - Permanent							
conservation cover (1000 hectares)							
Land impacted for carbon sink -							322
Aggressive deployment - Total (1000							
hectares)							

Premature deaths from air pollution - Fuel Comb - Electric Generation - Coal (deaths) 5.62 0.008 0.008 0.005 0.003 0 Premature deaths from air pollution - Fuel Comb - Electric Generation - Natural Gas (deaths) 1.82 1.3 1.09 0.723 0.365 Premature deaths from air pollution - Premature deaths from air pollution - Fuel Comb - Residential - Natural Gas (deaths) 54.2 579 59.3 55.9 46.5 33.1 Premature deaths from air pollution - Fuel Comb - Residential - Natural Gas (deaths) 9.33 9.15 8.64 7.44 5.58 3.63 Premature deaths from air pollution - Fuel Comb - Residential - Natural Gas (deaths) 0.292 0.28 0.263 0.241 0.217 0.192 Premature deaths from air pollution - Fuel Comb - Residential - Oli (deaths) 0.596 0.618 0.631 0.598 0.507 0.402 Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Coal (deaths) 0.054 0.055 0.056 0.056 0.056 0.056 0.057 0.402 Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Natural Gas (deaths) 13.3 13.7 13.7	Item	2020	2025	2030	2035	2040	2045	2050
Fuel Comb - Electric Generation - Coal (deaths)	Premature deaths from air pollution -		5.62	0.008	0.008	0.005	0.003	0
(deaths) -<	Fuel Comb - Electric Generation - Coal							
Premature deaths from air pollution - Fuel Comb - Electric Generation - Natural Gas (deaths) 4.43 1.82 1.3 1.09 0.723 0.365 Premature deaths from air pollution - Mobile - On-Road (deaths) 54.2 57.9 59.3 55.9 46.5 33.1 Premature deaths from air pollution - Gas stations (deaths) 9.33 3.42 3.62 3.68 3.45 2.65 2.04 Premature deaths from air pollution - Fuel Comb - Residential - 01 (deaths) 0.292 0.28 0.263 0.241 0.217 0.192 Premature deaths from air pollution - Fuel Comb - Residential - 01 (deaths) 0.596 0.618 0.631 0.598 0.507 0.402 Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Coal (deaths) 0.054 0.055 0.056 0.056 0.055 Premature deaths from air pollution - Fuel Comb - Comm/Institutional - 011 1.8 1.64 1.49 1.34 1.2 1.05 Premature deaths from air pollution - Fuel Comb - Comm/Institutional - 011 1.8 1.64 1.49 1.34 1.2 1.05 Premature deaths from air pollution - fuel Comb - Comm/Institu	(deaths)							
Fuel Comb - Electric Generation - Natural Gas (deaths) Image: Comp - Comp	Premature deaths from air pollution -		4.43	1.82	1.3	1.09	0.723	0.365
Gas (deaths) - - Premature deaths from air pollution - Gas 3.4 3.62 3.68 3.45 2.85 2.04 Stations (deaths) 9.33 9.15 8.64 7.44 5.58 3.63 Premature deaths from air pollution - Fuel Comb - Residential - Natural Gas (deaths) 0.292 0.28 0.263 0.241 0.217 0.192 Premature deaths from air pollution - Fuel Comb - Residential - Oil (deaths) 0.596 0.618 0.631 0.598 0.507 0.402 Premature deaths from air pollution - Fuel Comb - Residential - Oil (deaths) 0.596 0.618 0.631 0.598 0.507 0.402 Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Coal (deaths) 0.054 0.055 0.056 0.056 0.056 0.056 0.056 0.056 0.056 0.056 0.056 0.056 0.056 0.056 0.056 0.056 0.056 0.593 0.527 Fuel Comb - Comm/Institutional - Oil (deaths) - - - - - - - - -	Fuel Comb - Electric Generation - Natural							
Premature deaths from air pollution - Mobile - On-Road (deaths) 54.2 579 59.3 55.9 46.5 33.1 Mobile - On-Road (deaths) 9 3.4 3.62 3.68 3.45 2.85 2.04 Stations (deaths) 9 9.33 9.15 8.64 7.44 5.58 3.63 Premature deaths from air pollution - Fuel Comb - Residential - Natural Gas (deaths) 0.292 0.28 0.263 0.241 0.217 0.192 Premature deaths from air pollution - Fuel Comb - Residential - Oli (deaths) 0.596 0.618 0.631 0.598 0.507 0.402 Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Coal (deaths) 0.054 0.055 0.056 0.056 0.056 0.056 0.056 0.056 0.056 0.057 0.402 Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Natural Gas (deaths) 13.3 13.7 13.7 12.6 10.4 7.72 Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Olie (deaths) 1.8 1.64 1.49 1.34 1.2 1.05	Gas (deaths)							
Mobile - On-Road (deaths) - - Premature deaths from air pollution - Gas 3.4 3.62 3.68 3.45 2.04 Premature deaths from air pollution - Fuel Comb - Residential - Natural Gas (deaths) 9.33 9.15 8.64 7.44 5.58 3.63 Premature deaths from air pollution - Fuel Comb - Residential - Oil (deaths) 0.292 0.28 0.263 0.241 0.217 0.192 Premature deaths from air pollution - Fuel Comb - Residential - Oil (deaths) 0.596 0.618 0.631 0.598 0.507 0.402 Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Coal (deaths) 0.054 0.055 0.056 0.056 0.056 0.056 0.056 0.055 Fuel Comb - Comm/Institutional - Coal (deaths) - 13.3 13.7 13.7 12.6 10.4 7.72 Fuel Comb - Comm/Institutional - Oil (deaths) -	Premature deaths from air pollution -		54.2	57.9	59.3	55.9	46.5	33.1
Premature deaths from air pollution - Gas Stations (deaths) 3.4 3.62 3.68 3.45 2.85 2.04 Stations (deaths) Premature deaths from air pollution - Fuel Comb - Residential - Natural Gas (deaths) 9.33 9.15 8.64 7.44 5.58 3.63 Premature deaths from air pollution - Fuel Comb - Residential - Oli (deaths) 0.292 0.28 0.263 0.241 0.217 0.192 Premature deaths from air pollution - Fuel Comb - Residential - Other (deaths) 0.596 0.618 0.631 0.598 0.507 0.402 Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Coal (deaths) 0.054 0.055 0.056 0.056 0.056 0.056 Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Otal (deaths) 13.3 13.7 13.7 12.6 10.4 7.72 Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Oil (deaths) 13.8 1.64 1.49 1.34 1.2 1.05 Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Oil (deaths) 0.012 0.013 0.012 0.012 0.012 Prematu	Mobile - On-Road (deaths)							
Stations (deaths) 9.33 9.15 8.64 7.44 5.58 3.63 Premature deaths from air pollution - Fuel Comb - Residential - 0i (deaths) 0.292 0.28 0.263 0.241 0.217 0.192 Premature deaths from air pollution - Fuel Comb - Residential - 0il (deaths) 0.596 0.618 0.631 0.598 0.507 0.402 Premature deaths from air pollution - Fuel Comb - Residential - 0ther (deaths) 0.054 0.055 0.056 0.056 0.056 0.056 0.056 0.055 Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Coal (deaths) 13.3 13.7 13.7 12.6 10.4 7.72 Premature deaths from air pollution - Fuel Comb - Comm/Institutional - 0il (deaths) 18 1.64 1.49 1.34 1.2 1.05 Premature deaths from air pollution - Fuel Comb - Comm/Institutional - 0il (deaths) 0.798 0.755 0.709 0.654 0.593 0.527 Premature deaths from air pollution - Fuel Comb - Comm/Institutional - 0il (deaths) 0.012 0.013 0.012 0.012 0.012 Premature deaths from air pollution - Fuel	Premature deaths from air pollution - Gas		3.4	3.62	3.68	3.45	2.85	2.04
Premature deaths from air pollution - Fuel Comb - Residential - Natural Gas (deaths) 9.33 9.15 8.64 7.44 5.58 3.63 Premature deaths from air pollution - Fuel Comb - Residential - Other (deaths) 0.292 0.28 0.263 0.241 0.217 0.192 Premature deaths from air pollution - Fuel Comb - Residential - Other (deaths) 0.596 0.618 0.631 0.598 0.507 0.402 Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Coal (deaths) 0.054 0.055 0.056 0.57 0.056 0.056 0.056 0.056 0.056 0.056 0.057 0.057	Stations (deaths)							
Fuel Comb - Residential - Natural Gas (deaths) 0.292 0.28 0.263 0.241 0.217 0.192 Premature deaths from air pollution - Fuel Comb - Residential - Oil (deaths) 0.596 0.618 0.631 0.598 0.507 0.402 Premature deaths from air pollution - Fuel Comb - Residential - Other (deaths) 0.054 0.055 0.056 0.057 </td <td>Premature deaths from air pollution -</td> <td></td> <td>9.33</td> <td>9.15</td> <td>8.64</td> <td>7.44</td> <td>5.58</td> <td>3.63</td>	Premature deaths from air pollution -		9.33	9.15	8.64	7.44	5.58	3.63
(deaths) 0.292 0.28 0.263 0.241 0.217 0.192 Premature deaths from air pollution - Fuel Comb - Residential - Oil (deaths) 0.596 0.618 0.631 0.598 0.507 0.402 Premature deaths from air pollution - Fuel Comb - Residential - Other (deaths) 0.054 0.055 0.056 0.057 0.056 0.057 0.067 0.067 0.067 <td< td=""><td>Fuel Comb - Residential - Natural Gas</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>	Fuel Comb - Residential - Natural Gas							
Premature deaths from air pollution - Fuel Comb - Residential - 0il (deaths) 0.292 0.28 0.263 0.241 0.217 0.192 Premature deaths from air pollution - Fuel Comb - Residential - 0ther (deaths) 0.596 0.618 0.631 0.598 0.507 0.402 Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Coal (deaths) 0.054 0.055 0.056 0.056 0.056 0.056 0.055 Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Natural Gas (deaths) 13.3 13.7 13.7 12.6 10.4 7.72 Premature deaths from air pollution - Fuel Comb - Comm/Institutional - 0il (deaths) 1.8 1.64 1.49 1.34 1.2 1.05 Premature deaths from air pollution - Fuel Comb - Comm/Institutional - 0il (deaths) 0.0798 0.755 0.709 0.654 0.593 0.527 Premature deaths from air pollution - Fuel Comb - Comm/Institutional - 0ther (deaths) 0.012 0.013 0.012 0.012 0.012 0.012 0.012 0.012 0.012 0.012 0.012 0.012 0.012 0.012 0.012 0.012 <t< td=""><td>(deaths)</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	(deaths)							
Fuel Comb - Residential - Oil (deaths) Output Output <th< td=""><td>Premature deaths from air pollution -</td><td></td><td>0.292</td><td>0.28</td><td>0.263</td><td>0.241</td><td>0.217</td><td>0.192</td></th<>	Premature deaths from air pollution -		0.292	0.28	0.263	0.241	0.217	0.192
Premature deaths from air pollution - Fuel Comb - Residential - Other (deaths) 0.596 0.618 0.631 0.598 0.507 0.402 Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Coal (deaths) 0.054 0.055 0.056 0.056 0.056 0.055 0.056 0.056 0.055 0.056 0.056 0.055 0.056 0.056 0.056 0.055 0.056 0.056 0.055 0.056 0.056 0.055 0.056 0.056 0.055 0.056 0.056 0.055 0.056 0.056 0.055 0.056 0.056 0.055 0.056 0.055 0.056 0.055 0.056 0.055 0.056 0.055 0.056 0.055 0.056 0.055 0.056 0.055 0.056 0.055 0.056 0.055 0.056 0.055 0.056 0.055 0.056 0.055 0.056 0.055 0.056 0.055 0.057 0.056 0.055 0.057 0.57 0.056 0.057 0.527 0.575 0.057 0.012	Fuel Comb - Residential - Oil (deaths)		-			_	-	
Fuel Comb - Residential - Other (deaths) 0.054 0.055 0.056 0.057 0.060 0.057 0.060 0.057 0.079 0.654 0.593 0.527 0.057 0.012	Premature deaths from air pollution -		0.596	0.618	0.631	0.598	0.507	0.402
Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Coal (deaths) 0.054 0.055 0.056 0.056 0.056 0.055 Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Natural Gas (deaths) 13.3 13.7 13.7 12.6 10.4 7.72 Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Oil (deaths) 1.8 1.64 1.49 1.34 1.2 1.05 Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Oil (deaths) 0.798 0.755 0.709 0.654 0.593 0.527 Premature deaths from air pollution - fuel Comb - Comm/Institutional - Other (deaths) 0.085 0.012 0.013 0.012 0.012 Premature deaths from air pollution - Industrial Processes - Coal Mining (deaths) 11.7 11.1 10.1 9.14 8.42 6.23 Production (deaths) 0.067 0.067 0.044 0.027 0 Monetary damages from air pollution - Fuel Comb - Electric Generation - Coal (million \$2019) 39.2 16.1 11.5 9.69 6.41 3.23 Monetary damages from air pollution - Fuel Comb - Electric Generation - Natural G	Fuel Comb - Residential - Other (deaths)							
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(deaths) Image: constraint of constrant of constrant of constraint of constrant of constraint of const	Fuel Comb - Comm/Institutional - Coal							
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Fuel Comb - Comm/Institutional - Natural Gas (deaths) Natural Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Oil (deaths) Natural No. Natural Natural Natural Natural Natural Natural Natural Natural Natural Na	Premature deaths from air pollution -		13.3	13.7	13.7	12.6	10.4	7.72
Gas (deaths) Image: Construct of the state	Fuel Comb - Comm/Institutional - Natural			_	_	_	-	
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Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Other (deaths) 0.798 0.755 0.709 0.654 0.593 0.527 Premature deaths from air pollution - Industrial Processes - Coal Mining (deaths) 0.085 0.012 0.013 0.012 <td>(deaths)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	(deaths)							
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(deaths)0.0850.0120.0130.0120.012Premature deaths from air pollution - Industrial Processes - Coal Mining (deaths)0.0850.0120.0130.0130.0120.012Premature deaths from air pollution - Industrial Processes - Oil & Gas Production (deaths)11.711.110.19.148.426.23Monetary damages from air pollution - Fuel Comb - Electric Generation - Coal (million \$2019)49.80.0670.0670.0440.0270Monetary damages from air pollution - Fuel Comb - Electric Generation - Natural Gas (million \$2019)39.216.111.59.696.413.23Monetary damages from air pollution - Fuel Comb - Electric Generation - Natural Gas (million \$2019)30.132.132.630.525.318Monetary damages from air pollution - Gas Stations (million \$2019)30.132.132.630.525.318	Fuel Comb - Comm/Institutional - Other							
Premature deaths from air pollution - Industrial Processes - Coal Mining (deaths) 0.085 0.012 0.013 0.012 0.012 Premature deaths from air pollution - Industrial Processes - Oil & Gas 11.7 11.1 10.1 9.14 8.42 6.23 Premature deaths from air pollution - Industrial Processes - Oil & Gas 11.7 11.1 10.1 9.14 8.42 6.23 Production (deaths) Monetary damages from air pollution - Fuel Comb - Electric Generation - Coal (million \$2019) 49.8 0.067 0.067 0.044 0.027 0 Monetary damages from air pollution - Fuel Comb - Electric Generation - Natural Gas (million \$2019) 39.2 16.1 11.5 9.69 6.41 3.23 Monetary damages from air pollution - Fuel Comb - Electric Generation - Natural Gas (million \$2019) 482 515 527 497 413 295 Mobile - On-Road (million \$2019) 30.1 32.1 32.6 30.5 25.3 18 Gas Stations (million \$2019) 30.1 32.1 32.6 30.5 25.3 18	(deaths)							
Industrial Processes - Coal Mining (deaths)Image: Constraint of the systemImage: Constra	Premature deaths from air pollution -		0.085	0.012	0.013	0.013	0.012	0.012
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Production (deaths)49.80.0670.0670.0440.0270Monetary damages from air pollution - Fuel Comb - Electric Generation - Coal (million \$2019)49.80.0670.0670.0440.0270Monetary damages from air pollution - Fuel Comb - Electric Generation - Natural Gas (million \$2019)39.216.111.59.696.413.23Monetary damages from air pollution - Fuel Comb - Electric Generation - Natural Gas (million \$2019)39.216.111.59.696.413.23Monetary damages from air pollution - Mobile - On-Road (million \$2019)482515527497413295Monetary damages from air pollution - Gas Stations (million \$2019)30.132.132.630.525.318	Industrial Processes - Oil & Gas				_		-	
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Fuel Comb - Electric Generation - Coal (million \$2019)AndClockClockClockMonetary damages from air pollution - Gas (million \$2019)39.216.111.59.696.413.23Monetary damages from air pollution - Monetary damages from air pollution - Gas Stations (million \$2019)30.132.132.630.525.318	Monetary damages from air pollution -		49.8	0.067	0.067	0.044	0.027	0
(million \$2019)39.216.111.59.696.413.23Fuel Comb - Electric Generation - Natural Gas (million \$2019)39.216.111.59.696.413.23Monetary damages from air pollution - Mobile - On-Road (million \$2019)482515527497413295Monetary damages from air pollution - Mobile - On-Road (million \$2019)30.132.132.630.525.318Gas Stations (million \$2019)	Fuel Comb - Electric Generation - Coal							-
Monetary damages from air pollution - Fuel Comb - Electric Generation - Natural Gas (million \$2019)39.216.111.59.696.413.23Monetary damages from air pollution - Mobile - On-Road (million \$2019)482515527497413295Monetary damages from air pollution - Mobile - On-Road (million \$2019)30.132.132.630.525.318	(million \$2019)							
Fuel Comb - Electric Generation - Natural Gas (million \$2019)One 482SincAndAndMonetary damages from air pollution - Mobile - On-Road (million \$2019)482515527497413295Monetary damages from air pollution - Gas Stations (million \$2019)30.132.132.630.525.318	Monetary damages from air pollution -		39.2	16.1	11.5	9.69	6.41	3.23
Gas (million \$2019)482515527497413295Mobile - On-Road (million \$2019)30.132.132.630.525.318Gas Stations (million \$2019)	Fuel Comb - Electric Generation - Natural		07.2					0.20
Monetary damages from air pollution - Mobile - On-Road (million \$2019)482515527497413295Monetary damages from air pollution - Gas Stations (million \$2019)30.132.132.630.525.318	Gas (million \$2019)							
Mobile - On-Road (million \$2019) 30.1 32.1 32.6 30.5 25.3 18 Gas Stations (million \$2019) 30.1 32.1 32.6 30.5 25.3 18	Monetary damages from air pollution -		482	515	527	497	413	295
Monetary damages from air pollution - 30.1 32.1 32.6 30.5 25.3 18 Gas Stations (million \$2019) 30.1 30.1 32.1 32.6 30.5 25.3 18	Mobile - On-Road (million \$2019)			0.0				_, 0
Gas Stations (million \$2019)	Monetary damages from air pollution -		30.1	32.1	32.6	30.5	25.3	18
	Gas Stations (million \$2019)				52.0			

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

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

Item	2020	2025	2030	2035	2040	2045	2050
Monetary damages from air pollution - Fuel Comb - Residential - Natural Gas (million \$2019)		82.7	81	76.6	66	49.4	32.2
Monetary damages from air pollution - Fuel Comb - Residential - Oil (million \$2019)		2.59	2.48	2.33	2.14	1.93	1.7
Monetary damages from air pollution - Fuel Comb - Residential - Other (million \$2019)		5.29	5.48	5.59	5.3	4.49	3.56
Monetary damages from air pollution - Fuel Comb - Comm/Institutional - Coal (million \$2019)		0.48	0.491	0.497	0.497	0.494	0.487
Monetary damages from air pollution - Fuel Comb - Comm/Institutional - Natural Gas (million \$2019)		117	122	121	111	91.9	68.4
Monetary damages from air pollution - Fuel Comb - Comm/Institutional - Oil (million \$2019)		15.9	14.5	13.2	11.9	10.6	9.32
Monetary damages from air pollution - Fuel Comb - Comm/Institutional - Other (million \$2019)		7.06	6.69	6.28	5.79	5.25	4.67
Monetary damages from air pollution - Industrial Processes - Coal Mining (million \$2019)		0.748	0.109	0.112	0.112	0.109	0.105
Monetary damages from air pollution - Industrial Processes - Oil & Gas Production (million \$2019)		104	98.8	89.3	81.2	74.8	55.4

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

Item	2020	2025	2030	2035	2040	2045	2050
By economic sector - Agriculture (jobs)		5.28	7.39	2.76	2.04	1.7	1.5
By economic sector - Construction (jobs)		5,446	5,745	10,135	9,358	9,902	12,274
By economic sector - Manufacturing		1,311	1,594	1,695	1,546	1,661	1,894
(jobs)							
By economic sector - Mining (jobs)		1,003	723	529	390	255	138
By economic sector - Other (jobs)		703	776	1,834	1,769	2,022	2,986
By economic sector - Pipeline (jobs)		262	240	227	199	165	94
By economic sector - Professional (jobs)		2,082	2,256	4,030	3,883	4,319	5,715
By economic sector - Trade (jobs)		1,572	1,615	2,812	2,727	3,040	4,144
By economic sector - Utilities (jobs)		4,210	4,726	6,483	6,752	7,640	8,532
By resource sector - Biomass (jobs)		21	19.9	9.35	8.57	7.84	7.07
By resource sector - CO2 (jobs)		0	204	411	409	407	108
By resource sector - Coal (jobs)		173	32.1	0	0	0	0
By resource sector - Grid (jobs)		6,022	7,523	11,121	11,613	13,048	15,776
By resource sector - Natural Gas (jobs)		2,954	2,305	1,943	1,996	2,320	1,674
By resource sector - Nuclear (jobs)		0	0.004	0.009	0	0	0
By resource sector - Oil (jobs)		2,096	1,759	1,481	1,244	911	521
By resource sector - Solar (jobs)		4,866	4,881	11,800	10,508	11,285	16,315
By resource sector - Wind (jobs)		462	959	982	848	1,027	1,378
By education level - All sectors - High		7,083	7,561	11,931	11,393	12,347	15,183
school diploma or less (jobs)							
By education level - All sectors -		5,323	5,707	9,005	8,674	9,490	11,699
Associates degree or some college (jobs)							
By education level - All sectors -		3,274	3,450	5,287	5,088	5,552	6,865
Bachelors degree (jobs)							
By education level - All sectors - Masters		800	846	1,327	1,284	1,410	1,765
or professional degree (jobs)							
By education level - All sectors - Doctoral		113	118	198	188	206	266
degree (jobs)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Related work experience - All sectors -		2,429	2,594	4,083	3,930	4,289	5,291
None (jobs)							
Related work experience - All sectors - Up		3,294	3,521	5,645	5,376	5,835	7,263
to 1 year (jobs)							
Related work experience - All sectors - 1		5,970	6,352	9,916	9,535	10,395	12,815
to 4 years (jobs)							
Related work experience - All sectors - 4		3,898	4,147	6,466	6,214	6,773	8,312
to 10 years (jobs)							
Related work experience - All sectors -		1,002	1,069	1,639	1,574	1,714	2,098
Over 10 years (jobs)							
On-the-Job Training - All sectors - None		899	949	1,525	1,454	1,580	1,983
(jobs)							
On-the-Job Training - All sectors - Up to 1		10,698	11,404	17,789	17,077	18,607	22,998
year (jobs)				(
On-the-Job Training - All sectors - 1 to 4		3,608	3,853	6,052	5,818	6,342	7,764
years (jobs)		4.007	1.0.07	0.110			
Un-the-Job Training - All sectors - 4 to 10		1,227	1,307	2,110	2,026	2,206	2,699
years (jobs)		1.11	170	070	050	070	
Un-the-Job Training - All sectors - Over IU		161	170	270	253	272	335
years (jobs)		0 (5 0	0.005	((00	(005		F 000
Un-Site of In-Plant Training - All sectors -		2,658	2,825	4,483	4,285	4,668	5,803
None (Jobs)		07(/	10 (10	1/ 0/ 0	15 507	14 000	00.00/
Un-Sile of In-Plant Training - All sectors -		9,764	10,410	16,243	15,597	16,992	20,984
On Site on In Dight Training All costons		0 707	2.076	1. 671.	4.4.01	1, 002	E 000
1 to (years (icho)		2,181	2,970	4,074	4,491	4,893	5,998
On Site on In Plant Training All costons		1.005	1 011	0.004	2.000	0.105	0///
(to 10 years (icho)		1,235	1,311	2,094	2,009	2,165	2,000
4 to 10 years (JUDS)		1/.0	1/1	050	0/5	0/0	007
Oven 10 veens (jobs)		149	101	203	245	208	321
Wago income All (million \$2010)		0.21	1 0 0 1	1 5 4 9	1 5 2 0	1 4 0 0	2 000
waye income - All (million \$2019)		931	1,001	1,568	1,530	1,690	2,099

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

Item	2020	2025	2030	2035	2040	2045	2050
Final energy use - Transportation (PJ)	291	276	258	242	229	214	195
Final energy use - Residential (PJ)	94.5	92.7	91.9	90.1	85.9	79.9	74.4
Final energy use - Commercial (PJ)	89.2	89.2	88.5	87.3	84.9	81.8	79
Final energy use - Industry (PJ)	73.7	73.6	72.4	73.5	76.5	78.3	80

Table 52: E-B+ scenario -	PILLAR 1:	Efficiencv/E	Electrification -	- Electricitv	demana

	-	-	-				
Item	2020	2025	2030	2035	2040	2045	2050
Electricity distribution capital invested -		2	2.09	2.43	2.55	2.99	3.14
Cumulative 5-yr (billion \$2018)							

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

	- /		1	-			
Item	2020	2025	2030	2035	2040	2045	2050
Vehicle stocks - LDV – EV (1000 units)	33.5	93.1	153	429	705	1,317	1,928
Vehicle stocks - LDV – All others (1000	2,520	2,520	2,520	2,390	2,261	1,742	1,224
units)							
Light-duty vehicle capital costs vs. REF -		0	80.1	162	553	1,721	2,514
Cumulative 5-yr (million \$2018)							
Public EV charging plugs - DC Fast (1000	0.256		0.253		1.17		3.2
units)							
Public EV charging plugs - L2 (1000 units)	0.619		6.09		28.1		76.9

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

Item	2020	2025	2030	2035	2040	2045	2050
Sales of space heating units - Electric	9.66	20.3	25	38.9	62.1	80.4	88.2
Sales of space heating units - Electric Resistance (%)	13.5	21.8	20.6	17.6	12.4	8.21	6.44
Sales of space heating units - Gas (%)	74.6	54.3	50.8	40.6	23.5	10.1	4.22
Sales of space heating units - Fossil (%)	2.25	3.63	3.53	2.94	1.99	1.35	1.13
Sales of water heating units - Electric Heat Pump (%)	0	1.53	5.88	18.5	39	54	60.1
Sales of water heating units - Electric Resistance (%)	23.2	38.6	38.2	36.7	35.1	35	35.4
Sales of water heating units - Gas Furnace (%)	75.1	58	54.2	42.9	24.1	9.21	2.71
Sales of water heating units - Other (%)	1.72	1.82	1.82	1.82	1.8	1.79	1.78
Sales of cooking units - Electric Resistance (%)	66.2	67.1	70.2	78.4	89.7	96.7	99.1
Sales of cooking units - Gas (%)	33.8	32.9	29.8	21.6	10.3	3.33	0.896
Residential HVAC investment in 2020s vs. REF - Cumulative 5-yr (billion \$2018)		3.39	4.49				

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

Item	2020	2025	2030	2035	2040	2045	2050
Sales of space heating units - Electric	3.34	13	18	32.6	57.8	78.9	88.5
Heat Pump (%)							
Sales of space heating units - Electric	3.3	3.43	3.51	3.82	4.64	5.8	6.5
Resistance (%)							
Sales of space heating units - Gas (%)	92.4	83.3	78.3	63.4	37.5	15.3	4.96
Sales of space heating units - Fossil (%)	0.985	0.242	0.226	0.167	0.082	0.026	0.007
Sales of water heating units - Electric	0.03	1.53	5.79	18.2	38.6	54.2	60.6
Heat Pump (%)							
Sales of water heating units - Electric	1.46	2.2	4.25	10.4	21	30.2	34.5
Resistance (%)							
Sales of water heating units - Gas (%)	98.1	95.9	89.6	71	39.9	15.3	4.5
Sales of water heating units - Other (%)	0.365	0.384	0.383	0.384	0.383	0.384	0.383
Sales of cooking units - Electric	41.9	46.2	50.2	60.8	75.4	84.6	87.8
Resistance (%)							
Sales of cooking units - Gas (%)	58.1	53.8	49.8	39.2	24.6	15.4	12.2
Commercial HVAC investment in 2020s -		7,460	8,285				
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)	809	242	0	0	0	0	0
Installed thermal - Natural gas (MW)	6,545	5,969	6,092	5,977	6,196	5,545	3,839
Installed thermal - Nuclear (MW)	0	0	0.002	0.005	0	0	0
Capital invested - Biomass power plant (billion \$2018)	0	0	0	0	0	0	0
Capital invested - Biomass w/ccu allam power plant (billion \$2018)	0	0	0	0	0	0	0
Capital invested - Biomass w/ccu power plant (billion \$2018)	0	0	0	0	0	0	0

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

Item	2020	2025	2030	2035	2040	2045	2050
Biomass power plant (GWh)	0	0	0	0	0	0	0
Biomass w/ccu power plant (GWh)	0	0	0	0	0	0	0
Biomass w/ccu allam power plant (GWh)	0	0	0	0	0	0	0

Item	2020	2025	2030	2035	2040	2045	2050
Number of facilities - Power (quantity)	0	0	0	0	0	0	0
Number of facilities - Power ccu	0	0	0	0	0	0	0
(quantity)							
Number of facilities - Allam power w ccu	0	0	0	0	0	0	0
(quantity)							
Number of facilities - Beccs hydrogen	0	0	0	0	0	0	0
(quantity)							
Number of facilities - Diesel (quantity)	0	0	0	0	0	0	0
Number of facilities - Diesel ccu (quantity)	0	0	0	0	0	0	0
Number of facilities - Pyrolysis (quantity)	0	0	0	0	0	0	0
Number of facilities - Pyrolysis ccu	0	0	0	0	0	0	0
(quantity)							
Number of facilities - Sng (quantity)	0	0	0	0	0	0	0
Number of facilities - Sng ccu (quantity)	0	0	0	0	0	0	0
Conversion capital investment -		0	0	0	0	0	0
Cumulative 5-yr (million \$2018)							
Biomass purchases (million \$2018/y)		0	0	0	0	0	0

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

Item	2020	2025	2030	2035	2040	2045	2050
Annual - All (MMT)		0	0.01	0.04	0.06	0.04	0.05
Annual - BECCS (MMT)		0	0	0	0	0	0
Annual - NGCC (MMT)		0	0.01	0.04	0.06	0.04	0.05
Annual - Cement and lime (MMT)		0	0	0	0	0	0
Cumulative - All (MMT)		0	0.01	0.05	0.11	0.15	0.2
Cumulative - BECCS (MMT)		0	0	0	0	0	0
Cumulative - NGCC (MMT)		0	0.01	0.05	0.11	0.15	0.2
Cumulative - Cement and lime (MMT)		0	0	0	0	0	0

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

Item	2020	2025	2030	2035	2040	2045	2050
Trunk (km)		0	0	0	0	0	0
Spur (km)		0	51.1	102	102	102	102
All (km)		0	51.1	102	102	102	102
Cumulative investment - Trunk (million \$2018)		0	0	0	0	0	0
Cumulative investment - Spur (million \$2018)		0	26.6	53.4	53.5	53.4	53.4
Cumulative investment - All (million \$2018)		0	26.6	53.4	53.5	53.4	53.4

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

		-					
Item	2020	2025	2030	2035	2040	2045	2050
Annual (MMT)		0	0	0	0	0	0
Injection wells (wells)		0	0	0	0	0	0
Resource characterization, appraisal, permitting costs (million \$2020)		0	0	0	0	0	0
Wells and facilities construction costs (million \$2020)		0	0	0	0	0	0

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink notential - Low - Accelerate							-791
regeneration (1000 tC02e/v)							171
Carbon sink notontial Low Avoid							115
defendentation (1000 ±0020 /v)							-115
Oenhon sink notential Low Extend							1.00/
Carbon sink polential - Low - Extend							-1,806
rotation length (1000 tC02e/y)							
Carbon sink potential - Low - Improve							-1.27
plantations (1000 tCO2e/y)							
Carbon sink potential - Low - Increase							-1.52
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - Low - Increase							-65.1
trees outside forests (1000 tCO2e/y)							
Carbon sink potential - Low - Reforest							0
cropland (1000 tCO2e/v)							
Carbon sink notential - Low - Reforest							-449
$p_{asture} (1000 \pm 0.02 e/v)$							
Carbon sink notantial Low Restore							0/.1
cal boll slik polentiai - Low - Restore							-041
Carbon sink potential - Low - All (not							-3,666
counting overlap) (1000 tC02e/y)							
Carbon sink potential - Mid - Accelerate							-1,185
regeneration (1000 tCO2e/y)							
Carbon sink potential - Mid - Avoid							-403
deforestation (1000 tCO2e/y)							
Carbon sink potential - Mid - Extend							-3,254
rotation length (1000 tC02e/v)							-, -
Carbon sink notential - Mid - Improve							-1.86
plantations (1000 tC02e/y)							1.00
Contractions (1000 (0026/y)							2.05
cal buil sink potential - Miu - Increase							-3.05
							10 /
Carbon sink potential - Mid - Increase							-126
trees outside forests (1000 tC02e/y)							
Carbon sink potential - Mid - Reforest							0
cropland (1000 tCO2e/y)							
Carbon sink potential - Mid - Reforest							-319
pasture (1000 tCO2e/y)							
Carbon sink potential - Mid - Restore							-1,668
productivity (1000 tCO2e/y)							
Carbon sink notential - Mid - All (not							-6.960
counting overlan) (1000 tC02e/v)							0,700
Carbon sink notential - High - Accelerate							_1 579
nogeneration (1000 tC020/y)							-1,017
Control of the stantial High Avoid							(01
dafanastation (1000 t000s (v)							-091
deforestation (1000 tc02e/y)							
Carbon sink potential - High - Extend							-4,703
rotation length (1000 tCO2e/y)							
Carbon sink potential - High - Improve							-2.49
plantations (1000 tCO2e/y)							
Carbon sink potential - High - Increase							-4.57
retention of HWP (1000 tCO2e/y)							
Carbon sink notential - High - Increase							-186
trees outside forests (1000 tC02e/v)							
Carhon sink notential - High - Reforest							
oronland (1000 +0020/v)							0
Contract not on the second sec							
Garbun Sink polenilai - High - Reforest							-593
							10.07
Carbon sink potential - High - All (not							-10,254
counting overlap) (1000 tCO2e/y)							
Carbon sink potential - High - Restore							-2,495
productivity (1000 tCO2e/y)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Land impacted for carbon sink potential -							129
Low - Accelerate regeneration (1000							
hectares)							
Land impacted for carbon sink potential -							87.9
Low - Avoid deforestation (over 30 vears)							
(1000 hectares)							
Land impacted for carbon sink notential -							919
Low - Extend rotation length (1000							,,,,
hectares)							
Land impacted for carbon sink notential -							0 / 59
Low Improve plantations (1000							0.407
hostanos)							
Land impacted for earbon sink notantial							
Land Impacted for carbon sink potential -							U
Low - Increase recention of HWP (1000							
Land impacted for carbon sink potential -							9.3
LOW - INCREASE LIVES OULSIDE IORESIS							
Land impacted for carbon sink potential -							0
Low - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							2.92
Low - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							500
Low - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							1,649
Low - Total impacted (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							194
Mid - Accelerate regeneration (1000							
hectares)							
Land impacted for carbon sink potential -							90.7
Mid - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							1,658
Mid - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							0.69
Mid - Improve plantations (1000 hectares)							
Land impacted for carbon sink notential -							0
Mid - Increase retention of HWP (1000							U
hectares)							
Land impacted for carbon sink notential -							13.5
Mid - Increase trees outside forests (1000							10.0
hartares)							
Land impacted for carbon sink notential							0
Mid Defenset excellent (1000 bestares)							0
Land impacted for earbon sink notantial							
Mid Defenset posture (1000 besteres)							21.1
Hand imposted for early notantial							1 0 0 0
Land Impacted for carbon sink potential -							1,008
Mid - Restore productivity (1000							
Inectaries)							0.007
Land impacted for carbon sink potential -							2,986
Milu - Total impacted (over 30 years) (1000							
nectaresj							
Land impacted for carbon sink potential -							258
High - Accelerate regeneration (1000							
nectaresj							
Land impacted for carbon sink potential -							93.6
High - Avoid deforestation (over 30 years)							
(1000 hectares)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Land impacted for carbon sink potential -							2,398
High - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							0.918
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 -							17.7
High - Increase trees outside forests							
(1000 hectares)							
Land impacted for carbon sink potential -							0
High - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							16.8
High - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							827
High - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							3,612
High - Total impacted (over 30 years)							
(1000 hectares)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink notential - Moderate	2020	2020	2000	2000	2010	2010	0
denloyment - Corn-ethanol to energy							U
grasses (1000 tC02e/v)							
Carbon sink notential - Moderate							-114
deployment - Cropland measures (1000							
tCO2e/y)							
Carbon sink potential - Moderate							-0.807
deployment - Permanent conservation							
cover (1000 tC02e/y)							
Carbon sink potential - Moderate							0
deployment - Cropland to woody energy							
crops (1000 tCO2e/y)							
Carbon sink potential - Moderate							0
deployment - Pasture to energy crops							
(1000 tCO2e/y)							
Carbon sink potential - Moderate							-115
deployment - Total (1000 tCO2e/y)							
Carbon sink potential - Aggressive							0
deployment - Corn-ethanol to energy							
grasses (1000 tCO2e/y)							
Carbon sink potential - Aggressive							-227
deployment - Cropland measures (1000							
tCO2e/y)							
Carbon sink potential - Aggressive							-1.61
deployment - Permanent conservation							
cover (1000 tCO2e/y)							
Carbon sink potential - Aggressive							0
deployment - Cropland to woody energy							
crops (1000 tCO2e/y)							
Carbon sink potential - Aggressive							0
deployment - Pasture to energy crops							
(1000 tC02e/y)							
Carbon sink potential - Aggressive							-229
deployment - Total (1000 tCO2e/y)							

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							0
deployment - Corn-ethanol to energy							
grasses (1000 hectares)							
Land impacted for carbon sink - Moderate							160
deployment - Cropland measures (1000							
hectares)							
Land impacted for carbon sink - Moderate							1.24
deployment - Permanent conservation							
cover (1000 hectares)							
Land impacted for carbon sink - Moderate							0
deployment - Cropland to woody energy							
crops (1000 hectares)							
Land impacted for carbon sink - Moderate							0
deployment - Pasture to energy crops							
(1000 hectares)							
Land impacted for carbon sink - Moderate							162
deployment - Total (1000 hectares)							
Land impacted for carbon sink -							0
Aggressive deployment - Corn-ethanol to							
energy grasses (1000 hectares)							
Land impacted for carbon sink -							789
Aggressive deployment - Cropland							
measures (1000 hectares)							
Land impacted for carbon sink -							2.48
Aggressive deployment - Permanent							
conservation cover (1000 hectares)							
Land impacted for carbon sink -							0
Aggressive deployment - Cropland to							
woody energy crops (1000 hectares)							
Land impacted for carbon sink -							0
Aggressive deployment - Pasture to							
energy crops (1000 hectares)							
Land impacted for carbon sink -							791
Aggressive deployment - Total (1000							
hectaresJ							

Table 64: REF scenario - IMPACTS - Health

Item	2020	2025	2030	2035	2040	2045	2050
Premature deaths from air pollution -		9.01	5.31	2.87	2.18	2.03	1.91
Fuel Comb - Electric Generation - Coal							
(deaths)							
Premature deaths from air pollution -		5.4	3.64	3.95	3.71	5.74	5.29
Fuel Comb - Electric Generation - Natural							
Gas (deaths)							
Premature deaths from air pollution -		54	58.6	63.1	67.9	72.9	78.1
Mobile - On-Road (deaths)							
Premature deaths from air pollution - Gas		3.38	3.65	3.91	4.2	4.49	4.77
Stations (deaths)							
Premature deaths from air pollution -		9.27	9.24	9.28	9.57	10	10.6
Fuel Comb - Residential - Natural Gas							
(deaths)							
Premature deaths from air pollution -		0.313	0.321	0.323	0.323	0.327	0.334
Fuel Comb - Residential - Oil (deaths)							
Premature deaths from air pollution -		0.588	0.623	0.672	0.733	0.796	0.861
Fuel Comb - Residential - Other (deaths)							
Premature deaths from air pollution -		0.057	0.061	0.064	0.068	0.071	0.074
Fuel Comb - Comm/Institutional - Coal							
(deaths)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Premature deaths from air pollution -		13.4	13.8	13.5	13.1	13.3	14.2
Fuel Comb - Comm/Institutional - Natural							
Gas (deaths)							
Premature deaths from air pollution -		1.88	1.93	2.01	2.1	2.2	2.3
Fuel Comb - Comm/Institutional - Oil				_			
(deaths)							
Premature deaths from air pollution -		0.834	0.896	0.964	1.03	11	116
Fuel Comb - Comm/Institutional - Other		0.001	0.070	0.701			
(deaths)							
Premature deaths from air pollution -		0 227	0 156	0 126	0 124	0 123	0 118
Industrial Processes - Coal Mining		0.221	0.100	0.120	0.124	0.120	0.110
(deaths)							
Dremature deaths from air pollution -		11 Q	13.0	1/, /,	1/, 5	15.2	15
Industrial Processes - Oil & Cas		11.0	10.2	14.4	14.5	10.2	15
Draduction (doaths)							
Monotony domagon from air pollution		70.0	/.71	<u> </u>	10 /	10	16.0
Fuel Comb. Electric Concretion. Cool		17.0	47.1	25.4	19.4	10	10.7
(million #2010)							
(IIIIII0I1 \$2019) Manatany domagon from air pollution		(7.0	00.0	25	20.0	50.0	
Monetary damages from air pollution -		47.8	32.2	35	32.9	50.9	46.9
Fuel Comb - Electric Generation - Natural							
Gas (million \$2019)			504	F (4	(0)		
Monetary damages from air pollution -		480	521	561	604	648	695
Mobile - On-Road (million \$2019)							
Monetary damages from air pollution -		29.9	32.3	34.6	37.2	39.8	42.2
Gas Stations (million \$2019)							
Monetary damages from air pollution -		82.1	81.9	82.3	84.8	89	93.5
Fuel Comb - Residential - Natural Gas							
_(million \$2019)							
Monetary damages from air pollution -		2.78	2.84	2.86	2.87	2.9	2.96
Fuel Comb - Residential - Oil (million							
\$2019)							
Monetary damages from air pollution -		5.21	5.52	5.96	6.5	7.05	7.63
Fuel Comb - Residential - Other (million							
\$2019)							
Monetary damages from air pollution -		0.502	0.537	0.57	0.601	0.63	0.657
Fuel Comb - Comm/Institutional - Coal							
(million \$2019)							
Monetary damages from air pollution -		118	122	119	116	117	126
Fuel Comb - Comm/Institutional - Natural							
Gas (million \$2019)							
Monetary damages from air pollution -		16.6	17.1	17.8	18.6	19.5	20.4
Fuel Comb - Comm/Institutional - Oil							
(million \$2019)							
Monetary damages from air pollution -		7.38	7.93	8.53	9.12	9.71	10.3
Fuel Comb - Comm/Institutional - Other							
(million \$2019)							
Monetary damages from air pollution -		2	1.38	1.11	1.09	1.08	1.04
Industrial Processes - Coal Mining		-			,		
(million \$2019)							
Monetary damages from air nollution -		104	117	128	129	135	134
Industrial Processes - Oil & Gas		101		.20	,		
Production (million \$2019)							
	1 1			1	1	1	

Table 65: REF scenario - IMPACTS - Jobs

Item	2020	2025	2030	2035	2040	2045	2050
By economic sector - Agriculture (jobs)		5	4.49	4.43	3.61	3.6	3.91
By economic sector - Construction (jobs)		2,428	4,515	5,047	5,188	5,644	6,837
By economic sector - Manufacturing		888	1,082	1,275	1,273	1,228	1,237
(jobs)							
By economic sector - Mining (jobs)		1,022	842	694	556	473	398

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

Item	2020	2025	2030	2035	2040	2045	2050
By economic sector - Other (jobs)		114	565	703	797	902	1,480
By economic sector - Pipeline (jobs)		270	283	287	271	274	271
By economic sector - Professional (jobs)		1,024	1,711	1,935	2,050	2,312	2,966
By economic sector - Trade (jobs)		896	1,324	1,455	1,531	1,710	2,290
By economic sector - Utilities (jobs)		3,530	3,870	4,344	4,476	5,355	4,987
By resource sector - Biomass (jobs)		19.3	18.1	16.8	15	15.3	15.6
By resource sector - CO2 (jobs)		0	0	0	0	0	0
By resource sector - Coal (jobs)		173	90.5	85.8	31	0	0
By resource sector - Grid (jobs)		4,681	5,389	6,201	6,419	7,269	7,244
By resource sector - Natural Gas (jobs)		3,053	3,051	3,203	3,202	4,123	3,346
By resource sector - Nuclear (jobs)		0	0.002	0.005	0.005	0.012	0
By resource sector - Oil (jobs)		2,118	1,813	1,601	1,486	1,420	1,369
By resource sector - Solar (jobs)			3,499	4,220	4,524	4,707	8,094
By resource sector - Wind (jobs)		135	334	417	468	367	403
By education level - All sectors - High		4,242	6,051	6,723	6,886	7,596	8,699
school diploma or less (jobs)							
By education level - All sectors -		3,252	4,571	5,100	5,247	5,858	6,675
Associates degree or some college (jobs)		-, -	, -	-,	-,	-,	-,
By education level - All sectors -		2,114	2,797	3,067	3,133	3,469	3,956
Bachelors degree (jobs)		,	,	-,	-,	-, -	-,
By education level - All sectors - Masters		508	682	751	771	860	996
or professional degree (jobs)				-			-
By education level - All sectors - Doctoral		63.2	94.2	104	107	119	146
degree (jobs)							
Related work experience - All sectors -		1,495	2,087	2,321	2,385	2.656	3.036
None (jobs)		, -	,	, -		,	-,
Related work experience - All sectors - Up		1,903	2,789	3,106	3,188	3,504	4,091
to 1 year (jobs)							
Related work experience - All sectors - 1		3,720	5,118	5,666	5,809	6,449	7,355
to 4 years (jobs)					-	-	-
Related work experience - All sectors - 4		2,427	3,342	3,701	3,793	4,219	4,781
to 10 years (jobs)							
Related work experience - All sectors -		633	859	950	970	1,073	1,208
Over 10 years (jobs)							
On-the-Job Training - All sectors - None		528	760	841	863	950	1,122
(jobs)							
On-the-Job Training - All sectors - Up to 1		6,614	9,143	10,131	10,382	11,481	13,154
year (jobs)							
On-the-Job Training - All sectors - 1 to 4		2,218	3,101	3,447	3,537	3,944	4,457
years (jobs)							
On-the-Job Training - All sectors - 4 to 10		729	1,056	1,177	1,211	1,361	1,546
years (jobs)							
On-the-Job Training - All sectors - Over 10		89.6	135	149	152	166	193
years (jobs)							
On-Site or In-Plant Training - All sectors -		1,587	2,258	2,505	2,571	2,843	3,298
None (jobs)							
On-Site or In-Plant Training - All sectors -		6,042	8,352	9,254	9,483	10,493	12,006
Up to 1 year (jobs)							
On-Site or In-Plant Training - All sectors -		1,711	2,393	2,660	2,729	3,037	3,441
1 to 4 years (jobs)							
On-Site or In-Plant Training - All sectors -		747	1,064	1,181	1,213	1,360	1,538
4 to 10 years (jobs)							
On-Site or In-Plant Training - All sectors -		92.3	129	145	149	168	188
Over 10 years (jobs)							
Wage income - All (million \$2019)		591	811	906	940	1,060	1,211

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

Item	2020	2025	2030	2035	2040	2045	2050
Final energy use - Transportation (PJ)	291	280	269	263	267	277	288

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

Item	2020	2025	2030	2035	2040	2045	2050
Final energy use - Residential (PJ)	94.5	93.4	95	97.3	101	105	108
Final energy use - Commercial (PJ)	89.2	90.9	92	92.1	92.8	95.6	100
Final energy use - Industry (PJ)	73.8	76.5	78.3	81.6	85.7	92	98.7

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

Item	2020	2025	2030	2035	2040	2045	2050
Electricity distribution capital invested -		2.15	2.25	2.49	2.61	2.9	3.04
Cumulative 5-yr (billion \$2018)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Sales of space heating units - Electric	8.46	27.8	28.5	29.6	30.6	31.8	33.4
Heat Pump (%)							
Sales of space heating units - Electric	13.8	20.2	19.9	19.6	18.9	17.9	16.3
Resistance (%)							
Sales of space heating units - Gas (%)	75.5	49.2	48.8	48.1	47.9	47.8	47.7
Sales of space heating units - Fossil (%)	2.27	2.79	2.82	2.75	2.59	2.52	2.58
Sales of water heating units - Electric	0	0	0	0	0	0	0
Heat Pump (%)							
Sales of water heating units - Electric	23.2	38.8	38.9	38.9	39	39	39
Resistance (%)							
Sales of water heating units - Gas Furnace	75.1	59.4	59.3	59.3	59.2	59.2	59.2
(%)							
Sales of water heating units - Other (%)	1.72	1.82	1.82	1.82	1.81	1.81	1.81
Sales of cooking units - Electric	65.9	65.9	65.9	65.9	65.9	65.9	65.9
Resistance (%)							
Sales of cooking units - Gas (%)	34.1	34.1	34.1	34.1	34.1	34.1	34.1
Residential HVAC investment in 2020s vs.		3.21	3.39				
REF - Cumulative 5-yr (billion \$2018)							

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

	-,,	0005	0000	0005	00/0	00/5	0050
Item	2020	2025	2030	2035	2040	2045	2050
Sales of space heating units - Electric	3.34	23.9	63.4	77.1	78.7	78.8	78.8
Heat Pump (%)							
Sales of space heating units - Electric	3.3	5.04	10.6	16	20	20.6	20.7
Resistance (%)							
Sales of space heating units - Gas (%)	92.4	70.9	25.9	6.85	1.34	0.57	0.508
Sales of space heating units - Fossil (%)	0.985	0.211	0.092	0.03	0.004	0	0
Sales of water heating units - Electric	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Heat Pump (%)							
Sales of water heating units - Electric	1.46	1.47	1.47	1.48	1.47	1.48	1.47
Resistance (%)							
Sales of water heating units - Gas (%)	98.1	98.1	98.1	98.1	98.1	98.1	98.1
Sales of water heating units - Other (%)	0.365	0.384	0.383	0.384	0.383	0.384	0.383
Sales of cooking units - Electric	41.9	44.7	44.7	44.6	44.4	44.5	44.6
Resistance (%)							
Sales of cooking units - Gas (%)	58.1	55.3	55.3	55.4	55.6	55.5	55.4
Commercial HVAC investment in 2020s -		7,365	7,706				
Cumulative 5-yr (million \$2018)							

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

	,		J = - 12 ,				
Item	2020	2025	2030	2035	2040	2045	2050
Installed thermal - Coal (MW)	809	242	242	242	0	0	0
Installed thermal - Natural gas (MW)	6,564	6,056	6,315	6,808	6,833	7,895	6,118
Installed thermal - Nuclear (MW)	0	0	0.001	0.003	0.005	0.009	0
Installed renewables - Rooftop PV (MW)	675	1,040	1,389	1,810	2,310	2,893	3,583

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

Item	2020	2025	2030	2035	2040	2045	2050		
Installed renewables - Solar - Base land	4,809	4,809	4,809	4,809	4,809	4,809	4,809		
use assumptions (MW)									
Installed renewables - Wind - Base land	1,083	1,083	2,113	2,457	2,869	3,437	4,780		
use assumptions (MW)									
Installed renewables - Solar -	162	162	162	162	162	162	162		
Constrained land use assumptions (MW)									

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

Item	2020	2025	2030	2035	2040	2045	2050
Solar - Base land use assumptions (GWh)	13,021	13,021	13,021	13,021	13,021	13,021	13,021
Wind - Base land use assumptions (GWh)	3,183	3,183	6,139	7,102	8,269	9,863	13,558
OffshoreWind - Base land use	0	0	0	0	0	0	0
assumptions (GWh)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Business-as-usual carbon sink - Natural	0.51		1.5				0.43
uptake (Mt CO2e/y)							
Business-as-usual carbon sink - Retained	-0.001		-0.003				-0.003
in Hardwood Products (Mt CO2e/y)							
Business-as-usual carbon sink - Total (Mt	0.509		1.5				0.428
CO2e/y)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Low - Accelerate							-791
regeneration (1000 tCO2e/y)							
Carbon sink potential - Low - Avoid							-115
deforestation (1000 tCO2e/y)							
Carbon sink potential - Low - Extend							-1,806
rotation length (1000 tCO2e/y)							
Carbon sink potential - Low - Improve							-1.27
plantations (1000 tCO2e/y)							
Carbon sink potential - Low - Increase							-1.52
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - Low - Increase							-65.1
trees outside forests (1000 tCO2e/y)							
Carbon sink potential - Low - Reforest							0
cropland (1000 tCO2e/y)							
Carbon sink potential - Low - Reforest							-44.9
pasture (1000 tCO2e/y)							
Carbon sink potential - Low - Restore							-841
productivity (1000 tCO2e/y)							
Carbon sink potential - Low - All (not							-3,666
counting overlap) (1000 tCO2e/y)							
Carbon sink potential - Mid - Accelerate							-1,185
regeneration (1000 tCO2e/y)							
Carbon sink potential - Mid - Avoid							-403
deforestation (1000 tCO2e/y)							
Carbon sink potential - Mid - Extend							-3,254
rotation length (1000 tCO2e/y)							
Carbon sink potential - Mid - Improve							-1.86
plantations (1000 tCO2e/y)							
Carbon sink potential - Mid - Increase							-3.05
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - Mid - Increase							-126
trees outside forests (1000 tCO2e/y)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Mid - Reforest							0
cropland (1000 tC02e/v)							-
Carbon sink notential - Mid - Reforest							_310
nasture (1000 t C 0.2 e/v)							017
Carbon sink notontial Mid Postono							1 4 4 9
productivity (1000 t002 c/y)							-1,000
							(0(0
Carbon Sink potential - Mid - All (not							-6,960
counting overlap) (1000 tC02e/y)							
Carbon sink potential - High - Accelerate							-1,579
regeneration (1000 tCO2e/y)							
Carbon sink potential - High - Avoid							-691
deforestation (1000 tCO2e/y)							
Carbon sink potential - High - Extend							-4,703
rotation length (1000 tCO2e/v)							-
Carbon sink notential - High - Improve							-2 49
nlantations (1000 tC02e/v)							2.47
Carbon sink notential - High - Increase							_/, 57
notantian of UND (1000 t000 a (v)							-4.51
							10 (
Carbon sink potential - High - Increase							-186
trees outside forests (1000 tC02e/y)							
Carbon sink potential - High - Reforest							0
cropland (1000 tCO2e/y)							
Carbon sink potential - High - Reforest							-593
pasture (1000 tCO2e/y)							
Carbon sink potential - High - All (not							-10.254
counting overlan) (1000 tC02e/v)							
Carbon sink notential - High - Restore							-2 / 95
productivity (1000 tC020/y)							-2,470
Lond imposted for contantial							100
							129
Low - Accelerate regeneration (1000							
hectaresj							
Land impacted for carbon sink potential -							87.9
Low - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							919
Low - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							0.459
Low - Improve plantations (1000							
hertares)							
Land impacted for carbon sink notential							0
Low Thomson not on tan bolt sink potential -							0
Land impacted for carbon sink potential -							9.3
Low - Increase trees outside forests							
(1000 hectares)							
Land impacted for carbon sink potential -					Τ		0
Low - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							2.92
Low - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							500
Low - Restore productivity (1000							
hectares)							
Land impacted for carbon sink notential							16/10
Low - Total impacted (over 20 verse)							1,047
(1000 hostonos)							
Lond imported for containing starts at a							107
Lanu impacteu ior carbon sink potential -							194
Min - Accelerate regeneration (1000							
hectares)							

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

				0005	00/0	00/5	0050
	2020	2025	2030	2035	2040	2045	2050
Land impacted for carbon sink potential -							90.7
Mid - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							1,658
Mid - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							0.69
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 -							13.5
Mid - Increase trees outside forests (1000							
hectares)							
Land impacted for carbon sink potential -							0
Mid - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							21.1
Mid - Reforest pasture (1000 hectares)							
Land impacted for carbon sink notential -							1 008
Mid - Restore productivity (1000							1,000
hectares)							
Land impacted for carbon sink notential -							2 986
Mid Total impacted (over 20 years) (1000							2,700
hostonoo)							
Lond imposted for contant sink notantial							050
Lanu impacteu for carbon sink potential -							208
High - Accelerate regeneration (1000							
nectaresj							
Land Impacted for carbon sink potential -							93.6
High - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							2,398
High - Extend rotation length (1000							
hectaresj							
Land impacted for carbon sink potential -							0.918
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 -							17.7
High - Increase trees outside forests							
(1000 hectares)							
Land impacted for carbon sink potential -							0
High - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							16.8
High - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							827
High - Restore productivity (1000							
hectares)							
l and impacted for carbon sink notential -							3 612
High - Total impacted (over 30 years)							3,612
(1000 hectares)							
(l						