

Net-Zero America - Alabama data

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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 -		39.9	0.054	0.049	0.031	0.019	0.001
Fuel Comb - Electric Generation - Coal							
(deaths)							
Premature deaths from air pollution -		20.1	17.2	9.99	8.07	3.67	1.34
Fuel Comb - Electric Generation - Natural							
Gas (deaths)							
Premature deaths from air pollution -		111	103	77.4	44.4	20	7.7
Mobile - On-Road (deaths)							
Premature deaths from air pollution - Gas		9.74	8.88	6.63	3.89	1.86	0.853
Stations (deaths)							
Premature deaths from air pollution -		8.94	7.2	4.81	2.71	1.39	0.722
Fuel Comb - Residential - Natural Gas							
(deaths)							
Premature deaths from air pollution -		0.571	0.457	0.311	0.181	0.083	0.031
Fuel Comb - Residential - Oil (deaths)							
Premature deaths from air pollution -		2	1.75	1.31	0.841	0.438	0.2
Fuel Comb - Residential - Other (deaths)							
Premature deaths from air pollution -		1.67	1.59	1.5	1.41	1.31	1.22
Fuel Comb - Comm/Institutional - Coal							
(deaths)							
Premature deaths from air pollution -		5.28	4.61	3.4	2.16	1.32	0.844
Fuel Comb - Comm/Institutional - Natural							
Gas (deaths)							
Premature deaths from air pollution -		0.963	0.796	0.62	0.45	0.307	0.195
Fuel Comb - Comm/Institutional - Oil							
(deaths)							
Premature deaths from air pollution -		0.566	0.473	0.384	0.298	0.217	0.142
Fuel Comb - Comm/Institutional - Other						-	-
(deaths)							
Premature deaths from air pollution -		18.9	14.9	15	14.9	15.2	15.1
Industrial Processes - Coal Mining							
(deaths)							
Premature deaths from air pollution -		47.3	43.6	38.6	29.8	21.5	13
Industrial Processes - Oil & Gas							
Production (deaths)							
Monetary damages from air pollution -		354	0.481	0.436	0.278	0.172	0.012
Fuel Comb - Electric Generation - Coal							
(million \$2019)							
Monetary damages from air pollution -		178	153	88.5	71.5	32.5	11.9
Fuel Comb - Electric Generation - Natural							
Gas (million \$2019)							
Monetary damages from air pollution -		985	912	688	394	178	68.5
Mobile - On-Road (million \$2019)							
Monetary damages from air pollution -		86.3	78.6	58.7	34.4	16.5	7.56
Gas Stations (million \$2019)							
Monetary damages from air pollution -		79.3	63.8	42.6	24	12.3	6.39
Fuel Comb - Residential - Natural Gas							
(million \$2019)							
Monetary damages from air pollution -		5.06	4.05	2.75	1.61	0.733	0.273
Fuel Comb - Residential - Oil (million							
\$2019)							
Monetary damages from air pollution -		17.7	15.5	11.6	7.46	3.88	1.77
Fuel Comb - Residential - Other (million							
\$2019)							
Monetary damages from air pollution -		14.8	14.1	13.3	12.5	11.6	10.8
Fuel Comb - Comm/Institutional - Coal							
(million \$2019)							
Monetary damages from air pollution -		46.7	40.8	30.1	19.1	11.7	7.47
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 -		8.53	7.05	5.49	3.98	2.72	1.73
Fuel Comb - Comm/Institutional - Oil							
(million \$2019)							
Monetary damages from air pollution -		5.01	4.19	3.4	2.64	1.92	1.26
Fuel Comb - Comm/Institutional - Other							
(million \$2019)							
Monetary damages from air pollution -		167	132	132	132	135	134
Industrial Processes - Coal Mining							
(million \$2019)							
Monetary damages from air pollution -		420	387	342	265	191	116
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)		207	421	673	1,127	1,468	1,173
By economic sector - Construction (jobs)		5,947	12,693	15,020	16,872	23,378	28,837
By economic sector - Manufacturing		4,148	4,638	5,400	5,537	5,671	6,222
(jobs)							
By economic sector - Mining (jobs)		5,168	3,824	2,875	1,979	1,428	977
By economic sector - Other (jobs)		296	1,585	1,959	2,564	4,438	6,275
By economic sector - Pipeline (jobs)		667	817	856	628	561	568
By economic sector - Professional (jobs)		3,849	5,776	6,721	8,234	11,707	14,025
By economic sector - Trade (jobs)		2,902	3,982	4,315	4,990	7,245	9,269
By economic sector - Utilities (jobs)		10,656	13,210	16,241	18,164	21,020	23,580
By resource sector - Biomass (jobs)		890	1,161	1,917	3,392	5,354	5,010
By resource sector - CO2 (jobs)		5.69	2,217	3,546	2,622	3,152	3,827
By resource sector - Coal (jobs)		3,136	1,714	1,496	1,309	1,185	1,051
By resource sector - Grid (jobs)		10,557	14,929	20,970	24,800	32,971	40,572
By resource sector - Natural Gas (jobs)		9,132	8,036	6,638	7,116	5,084	3,801
By resource sector - Nuclear (jobs)		2,660	2,618	2,576	2,536	1,817	658
By resource sector - Oil (jobs)		6,244	5,177	4,041	2,741	1,846	1,054
By resource sector - Solar (jobs)		562	10,160	11,652	14,428	24,663	33,810
By resource sector - Wind (jobs)		655	934	1,223	1,149	844	1,143
By education level - All sectors - High		14,044	19,966	23,137	25,763	33,077	39,054
school diploma or less (jobs)				·	•		
By education level - All sectors -		10,414	14,793	17,191	19,121	24,530	29,307
Associates degree or some college (jobs)						-	
By education level - All sectors -		7,349	9,518	10,718	11,825	14,940	17,450
Bachelors degree (jobs)				-	-		
By education level - All sectors - Masters		1,793	2,341	2,647	2,964	3,806	4,458
or professional degree (jobs)							
By education level - All sectors - Doctoral		242	329	366	420	562	659
degree (jobs)							
Related work experience - All sectors -		4,801	6,793	7,888	8,821	11,352	13,468
None (jobs)							
Related work experience - All sectors - Up		6,498	9,317	10,784	12,104	15,731	18,630
to 1 year (jobs)							
Related work experience - All sectors - 1		12,469	17,014	19,518	21,639	27,579	32,540
to 4 years (jobs)							
Related work experience - All sectors - 4		7,927	10,946	12,580	13,918	17,717	20,956
to 10 years (jobs)							
Related work experience - All sectors -		2,146	2,878	3,289	3,611	4,537	5,333
Over 10 years (jobs)							
On-the-Job Training - All sectors - None		1,793	2,521	2,869	3,201	4,172	4,965
(jobs)							
On-the-Job Training - All sectors - Up to 1		22,515	30,685	35,247	39,228	50,116	58,995
year (jobs)							

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

		0005	0000	0005	00/0	00/5	0050
Item	2020	2025	2030	2035	2040	2045	2050
On-the-Job Training - All sectors - 1 to 4		7,084	10,032	11,617	12,850	16,382	19,475
years (jobs)							
On-the-Job Training - All sectors - 4 to 10		2,148	3,265	3,823	4,265	5,543	6,659
years (jobs)							
On-the-Job Training - All sectors - Over 10		302	444	504	550	702	832
years (jobs)							
On-Site or In-Plant Training - All sectors -		5,326	7,498	8,616	9,627	12,398	14,661
None (jobs)							
On-Site or In-Plant Training - All sectors -		20,502	27,961	32,120	35,702	45,605	53,745
Up to 1 year (jobs)							
On-Site or In-Plant Training - All sectors -		5,499	7,766	8,988	9,946	12,693	15,085
1 to 4 years (jobs)							
On-Site or In-Plant Training - All sectors -		2,241	3,320	3,861	4,287	5,534	6,614
4 to 10 years (jobs)							
On-Site or In-Plant Training - All sectors -		273	402	475	532	686	822
Over 10 years (jobs)							
Wage income - All (million \$2019)		1,813	2,469	2,866	3,213	4,117	4,895

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

Item	2020	2025	2030	2035	2040	2045	2050
Oil consumption - Annual (million bbls)		87.1	73.9	54.9	37.3	23.4	12.6
Oil consumption - Cumulative (million							1,701
bbls)							
Oil production - Annual (million bbls)		10.5	10.6	10.6	8.36	6.8	4.52
Natural gas consumption - Annual (tcf)		580	489	392	295	186	129
Natural gas consumption - Cumulative							11,820
(tcf)							
Natural gas production - Annual (tcf)		165	156	136	115	91.3	70.9

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

Item	2020	2025	2030	2035	2040	2045	2050		
Final energy use - Transportation (PJ)	546	508	443	365	294	250	232		
Final energy use - Residential (PJ)	163	153	141	126	114	108	105		
Final energy use - Commercial (PJ)	116	116	112	106	101	99.4	100		
Final energy use - Industry (PJ)	551	582	615	609	632	649	656		

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

Item	2020	2025	2030	2035	2040	2045	2050
Electricity distribution capital invested -		3.72	3.8	5.83	6.14	5	5.13
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)	12.8	447	881	2,399	3,918	5,132	6,345
Vehicle stocks - LDV – All others (1000	5,291	5,038	4,785	3,487	2,189	1,238	288
units)							
Light-duty vehicle capital costs vs. REF -		1,020	2,605	4,234	6,409	6,981	6,653
Cumulative 5-yr (million \$2018)							
Public EV charging plugs - DC Fast (1000	0.07		2.03		9.05		14.7
units)							
Public EV charging plugs - L2 (1000 units)	0.285		48.9		217		352

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

		tion Keole	Cincial				
Item	2020	2025	2030	2035	2040	2045	2050
Sales of space heating units - Electric	34.1	48.8	80.6	87.8	88.1	88	88
Heat Pump (%)							
Sales of space heating units - Electric	32.6	30.4	12.8	8.81	8.63	8.75	8.76
Resistance (%)							
Sales of space heating units - Gas (%)	27	14.4	4.38	2.16	2.08	2.05	2.05
Sales of space heating units - Fossil (%)	6.33	6.33	2.2	1.25	1.2	1.18	1.18
Sales of water heating units - Electric	0	12.1	64.3	75.9	76.4	76.4	76.4
Heat Pump (%)							
Sales of water heating units - Electric	72.5	72.8	30.8	21.4	21	21	21
Resistance (%)							
Sales of water heating units - Gas Furnace	23.5	12.5	2.34	0.099	0	0	0
(%)							
Sales of water heating units - Other (%)	3.93	2.64	2.61	2.62	2.63	2.63	2.64
Sales of cooking units - Electric	83.7	87.1	97.8	99.9	100	100	100
Resistance (%)							
Sales of cooking units - Gas (%)	16.3	12.9	2.2	0.111	0	0	0
Residential HVAC investment in 2020s vs.		3.86	4.57				
REF - Cumulative 5-yr (billion \$2018)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Sales of space heating units - Electric	11.7	29.4	77	90.8	91.9	92	92
Heat Pump (%)							
Sales of space heating units - Electric	5.83	4.63	4.92	6.27	6.62	6.6	6.56
Resistance (%)							
Sales of space heating units - Gas Furnace	82.5	63.1	17.5	2.95	1.48	1.44	1.44
(%)							
Sales of space heating units - Fossil (%)	0	2.9	0.562	0.024	0	0	0
Sales of water heating units - Electric	0.191	10.6	55.6	65.6	66.1	66.1	66.1
Heat Pump (%)							
Sales of water heating units - Electric	7.05	10.1	28.1	32.2	32.3	32.3	32.3
Resistance (%)							
Sales of water heating units - Gas Furnace	90.8	77.7	14.7	0.619	0	0	0
(%)							
Sales of water heating units - Other (%)	1.97	1.59	1.58	1.59	1.59	1.58	1.57
Sales of cooking units - Electric	43.5	55.3	83.4	88.9	89.2	89.2	89.1
Resistance (%)							
Sales of cooking units - Gas (%)	56.5	44.7	16.6	11.1	10.8	10.8	10.9
Commercial HVAC investment in 2020s -		13,557	15,391				
Cumulative 5-yr (million \$2018)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Installed thermal - Coal (MW)	4,966	0	0	0	0	0	0
Installed thermal - Natural gas (MW)	12,172	16,684	17,780	20,110	19,528	18,864	17,753
Installed thermal - Nuclear (MW)	5,270	5,270	5,270	5,270	5,270	1,776	888
Installed renewables - Rooftop PV (MW)	15.5	25	35.4	50.4	71.6	98.9	134
Installed renewables - Solar - Base land	335	335	7,425	14,948	23,422	41,407	64,744
use assumptions (MW)							
Installed renewables - Solar -	335	335	4,322	12,056	20,184	41,282	65,119
Constrained land use assumptions (MW)							
Capital invested - Solar PV - Base (billion		0	8.49	8.3	8.81	17.6	21.6
\$2018)							
Capital invested - Solar PV - Constrained		0.546	5.41	8.67	9.99	17.4	20.8
(billion \$2018)							
Capital invested - Biomass power plant	0	0	0	0	0	0	0
(billion \$2018)							

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

	,	0	, , ,				
Item	2020	2025	2030	2035	2040	2045	2050
Capital invested - Biomass w/ccu allam power plant (billion \$2018)	0	0	0	0	0.009	0	0
Capital invested - Biomass w/ccu power plant (billion \$2018)	0	0	0	0	11.9	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)	762	762	14,423	28,932	45,233	79,691	124,456
Wind - Base land use assumptions (GWh)	0	0	0	0	0	0	0
OffshoreWind - Base land use assumptions (GWh)	0	0	0	0	0	0	0
Solar - Constrained land use assumptions (GWh)	762	762	8,438	23,326	38,878	79,153	124,840
Wind - Constrained land use assumptions (GWh)	0	0	0	0	0	0	0
OffshoreWind - Constrained land use assumptions (GWh)	0	0	0	0	0	0	0
Biomass power plant (GWh)	0	0	0	0	0	0	0
Biomass w/ccu power plant (GWh)	0	0	0	0	13,376	13,376	13,376
Biomass w/ccu allam power plant (GWh)	0	0	0	0	8.94	8.94	8.94

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	10	10	10
(quantity)							
Number of facilities - Allam power w ccu	0	0	0	0	1	1	1
(quantity)							
Number of facilities - Beccs hydrogen	0	0	0	4	4	11	11
(quantity)							
Number of facilities - Diesel (quantity)	0	0	0	0	0	0	0
Number of facilities - Diesel ccu (quantity)	0	0	0	0	1	1	1
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	3,509	10,945	7,022	0
Cumulative 5-yr (million \$2018)							
Biomass purchases (million \$2018/y)		0	0	184	681	1,049	1,049

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

Item	2020	2025	2030	2035	2040	2045	2050
Annual - All (MMT)		0	3.24	10.3	22.7	36	37.5
Annual - BECCS (MMT)		0	0	4.51	17.3	26.4	26.3
Annual - NGCC (MMT)		0	0	2.46	2.07	2.77	4.1
Annual - Cement and lime (MMT)		0	3.24	3.35	3.32	6.84	7.07
Cumulative - All (MMT)		0	3.24	13.6	36.2	72.2	110
Cumulative - BECCS (MMT)		0	0	4.51	21.8	48.2	74.5
Cumulative - NGCC (MMT)		0	0	2.46	4.53	7.3	11.4
Cumulative - Cement and lime (MMT)		0	3.24	6.59	9.91	16.8	23.8

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

Item	2020	2025	2030	2035	2040	2045	2050
Trunk (km)		0	335	669	669	669	669
Spur (km)		0	313	1,922	3,063	3,862	4,205

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

Item	2020	2025	2030	2035	2040	2045	2050
All (km)		0	648	2,591	3,732	4,532	4,874
Cumulative investment - Trunk (million \$2018)		0	1,872	3,743	3,743	3,743	3,743
Cumulative investment - Spur (million \$2018)		0	222	1,248	2,405	3,157	3,361
Cumulative investment - All (million \$2018)		0	2,094	4,991	6,149	6,901	7,104

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

Item	2020	2025	2030	2035	2040	2045	2050
Annual (MMT)		0	2.19	8.81	16.3	27.5	35.4
Injection wells (wells)		0	2	10	18	32	38
Resource characterization, appraisal, permitting costs (million \$2020)		14.6	263	417	417	417	417
Wells and facilities construction costs (million \$2020)		0	80.8	315	561	938	1,164

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Low - Accelerate							-170
regeneration (1000 tCO2e/y)							
Carbon sink potential - Low - Avoid							-317
deforestation (1000 tCO2e/y)							
Carbon sink potential - Low - Extend							-4,448
rotation length (1000 tCO2e/y)							
Carbon sink potential - Low - Improve							-3,133
plantations (1000 tCO2e/y)							
Carbon sink potential - Low - Increase							-7,484
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - Low - Increase							-207
trees outside forests (1000 tCO2e/y)							
Carbon sink potential - Low - Reforest							-1,524
cropland (1000 tCO2e/y)							
Carbon sink potential - Low - Reforest							-531
pasture (1000 tCO2e/y)							
Carbon sink potential - Low - Restore							-1,873
productivity (1000 tCO2e/y)							
Carbon sink potential - Low - All (not							-19,687
counting overlap) (1000 tCO2e/y)							
Carbon sink potential - Mid - Accelerate							-255
regeneration (1000 tCO2e/y)							
Carbon sink potential - Mid - Avoid							-1,110
deforestation (1000 tCO2e/y)							
Carbon sink potential - Mid - Extend							-8,014
rotation length (1000 tCO2e/y)							
Carbon sink potential - Mid - Improve							-4,591
plantations (1000 tCO2e/y)							
Carbon sink potential - Mid - Increase							-14,968
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - Mid - Increase							-400
trees outside forests (1000 tCO2e/y)							
Carbon sink potential - Mid - Reforest							-2,286
cropland (1000 tCO2e/y)							
Carbon sink potential - Mid - Reforest							-3,768
pasture (1000 tCO2e/y)							
Carbon sink potential - Mid - Restore							-3,715
productivity (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 - All (not							-39,107
counting overlap) (1000 tCO2e/v)							
Carbon sink notential - High - Accelerate							-340
regeneration (1000 tC02e/v)							040
Carbon sink notantial High Avoid							1000
dafanastation (1000 t000s (c)							-1,902
deforestation (1000 tc02e/y)							
Carbon sink potential - High - Extend							-11,580
rotation length (1000 tCO2e/y)							
Carbon sink potential - High - Improve							-6,158
plantations (1000 tCO2e/v)							
Carbon sink notential - High - Increase							-22 452
retention of HWP (1000 tC02e/v)							22,402
Oerben eink netentiel High Trensee							
Carbon sink potential - High - Increase							-092
trees outside forests (1000 tG02e/y)							
Carbon sink potential - High - Reforest							-3,048
cropland (1000 tCO2e/y)							
Carbon sink potential - High - Reforest							-7,006
pasture (1000 tCO2e/v)							
Carbon sink notential - High - All (not							-58 635
counting overlap) (1000 tC020/v)							00,000
Counting over tapj (1000 1002e/y)							
Carbon sink potential - Hign - Restore							-5,558
productivity (1000 tCO2e/y)							
Land impacted for carbon sink potential -							27.8
Low - Accelerate regeneration (1000							
hectares)							
Land impacted for carbon sink notential -							242
Low - Avoid deforestation (over 30 years)							272
(1000 bostones)							
Land impacted for carbon sink potential -							2,262
Low - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							1,134
Low - Improve plantations (1000							
hectares)							
Land impacted for carbon sink notential							0
Land impacted for carbon sink potential -							0
LOW - Increase recention of HWP (1000							
nectaresj							
Land impacted for carbon sink potential -							29.6
Low - Increase trees outside forests							
(1000 hectares)							
Land impacted for carbon sink potential -							101
Low - Reforest cronland (1000 hectares)							
Lond impacted for carbon sink notontial							2/. 5
Land impacted for car bolt sink potential -							54.5
							4.445
Land impacted for carbon sink potential -							1,115
Low - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							4,946
Low - Total impacted (over 30 years)							
(1000 hectares)							
Land impacted for earbon sink notential							/.1 7
Lanu impacted for Carbon Sink potential -							41.7
Mid - Accelerate regeneration (1000							
nectaresj							
Land impacted for carbon sink potential -							250
Mid - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink notential -							4.084
Mid - Extend rotation length (1000							.,
hartaree							
Lond imposted for early actor tist							1707
Lanu impacteu for carbon sink potential -							1,707
Mid - Improve plantations (1000 hectares)							

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

Item	2020	2025	2030	2035	20/.0	20/15	2050
Land impacted for carbon sink notential -	2020	2023	2000	2000	2040	2043	0
Mid - Increase retention of HWP (1000							0
hectares)							
Land impacted for carbon sink notential -							42.9
Mid - Increase trees outside forests (1000							42.7
hectares)							
Land impacted for carbon sink notential -							151
Mid - Reforest cronland (1000 hectares)							101
Land impacted for carbon sink notential -							249
Mid - Reforest pasture (1000 hectares)							,
Land impacted for carbon sink potential -							2.245
Mid - Restore productivity (1000							_/_ · · ·
hectares)							
Land impacted for carbon sink potential -							8,770
Mid - Total impacted (over 30 years) (1000							
hectares)							
Land impacted for carbon sink potential -							55.6
High - Accelerate regeneration (1000							
hectares)							
Land impacted for carbon sink potential -							258
High - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							5,905
High - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							2,269
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 -							56.3
High - Increase trees outside forests							
(1000 hectares)							
Land impacted for carbon sink potential -							201
High - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							199
High - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							1,842
High - Restore productivity (1000							
hectaresj							
Land impacted for carbon sink potential -							10,786
High - Total impacted (over 30 years)							
(1000 hectares)							

Table 16: <i>E+ scenario</i>	- PILLAR 6: Land	sinks - Agriculture
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Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Moderate							-57.1
deployment - Corn-ethanol to energy							
grasses (1000 tCO2e/y)							
Carbon sink potential - Moderate							-1,171
deployment - Cropland measures (1000							
tCO2e/y)							
Carbon sink potential - Moderate							-29.1
deployment - Permanent conservation							
cover (1000 tCO2e/y)							
Carbon sink potential - Moderate							-1,257
deployment - Total (1000 tCO2e/y)							

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

					22/2		
Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Aggressive							-57.1
deployment - Corn-ethanol to energy							
grasses (1000 tCO2e/y)							
Carbon sink potential - Aggressive							-2,225
deployment - Cropland measures (1000							
tCO2e/y)							
Carbon sink potential - Aggressive							-58.1
deployment - Permanent conservation							
cover (1000 tCO2e/y)							
Carbon sink potential - Aggressive							-2,340
deployment - Total (1000 tCO2e/y)							
Land impacted for carbon sink - Moderate							33
deployment - Corn-ethanol to energy							
grasses (1000 hectares)							
Land impacted for carbon sink - Moderate							528
deployment - Cropland measures (1000							
hectares)							
Land impacted for carbon sink - Moderate							52.8
deployment - Permanent conservation							
cover (1000 hectares)							
Land impacted for carbon sink - Moderate							614
deployment - Total (1000 hectares)							0
Land impacted for carbon sink -							33
Aggressive deployment - Corn-ethanol to							00
energy grasses (1000 hectares)							
Land impacted for carbon sink -							1003
Aggressive deployment - Cropland							1,000
massures (1000 hectares)							
Land impacted for carbon sink -							106
Aggressive deployment - Dermanent							100
conservation cover (1000 bectares)							
Land impacted for carbon sink -							11/.0
Land impacted for carbon sink -							1,142
Ayyı cəsive deployilleril - Tolai (1000							
neutaresj							

Table 17: E- scenario - IMPACTS - Health

Item	2020	2025	2030	2035	2040	2045	2050
Premature deaths from air pollution -		39.9	0.054	0.049	0.031	0.019	0.001
Fuel Comb - Electric Generation - Coal							
(deaths)							
Premature deaths from air pollution -		19.5	12.9	5.33	2.12	0.677	0.397
Fuel Comb - Electric Generation - Natural							
Gas (deaths)							
Premature deaths from air pollution -		113	113	109	97.7	77.3	52.6
Mobile - On-Road (deaths)							
Premature deaths from air pollution - Gas		9.95	9.96	9.54	8.48	6.69	4.59
Stations (deaths)							
Premature deaths from air pollution -		9.02	8.05	7.02	5.74	4.3	2.91
Fuel Comb - Residential - Natural Gas							
(deaths)							
Premature deaths from air pollution -		0.583	0.545	0.509	0.442	0.338	0.23
Fuel Comb - Residential - Oil (deaths)							
Premature deaths from air pollution -		2.02	1.99	1.92	1.72	1.35	0.958
Fuel Comb - Residential - Other (deaths)							
Premature deaths from air pollution -		1.67	1.59	1.5	1.41	1.31	1.22
Fuel Comb - Comm/Institutional - Coal							
(deaths)							
Premature deaths from air pollution -		5.32	5.2	4.94	4.35	3.49	2.6
Fuel Comb - Comm/Institutional - Natural							
Gas (deaths)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Premature deaths from air pollution -		0.966	0.876	0.79	0.68	0.56	0.447
Fuel Comb - Comm/Institutional - Oil							
(deaths)							
Premature deaths from air pollution -		0.566	0.507	0.45	0.394	0.34	0.29
Fuel Comb - Comm/Institutional - Other							
(deaths)							
Premature deaths from air pollution -		18.7	15	15	15	15.2	15
Industrial Processes - Coal Mining							
(deaths)							
Premature deaths from air pollution -		47.2	41.6	34.7	29.2	25.2	17.8
Industrial Processes - Oil & Gas							
Production (deaths)							
Monetary damages from air pollution -		354	0.481	0.436	0.278	0.172	0.012
Fuel Comb - Electric Generation - Coal							
(million \$2019)							
Monetary damages from air pollution -		173	114	47.3	18.7	6	3.52
Fuel Comb - Electric Generation - Natural							
Gas (million \$2019)							
Monetary damages from air pollution -		1,002	1,004	970	869	687	468
Mobile - On-Road (million \$2019)							
Monetary damages from air pollution -		88.1	88.2	84.5	75.1	59.3	40.6
Gas Stations (million \$2019)							
Monetary damages from air pollution -		79.9	71.4	62.2	50.9	38.1	25.8
Fuel Comb - Residential - Natural Gas							
(million \$2019)							
Monetary damages from air pollution -		5.17	4.83	4.51	3.92	2.99	2.04
Fuel Comb - Residential - Oil (million							
\$2019)							
Monetary damages from air pollution -		17.9	17.6	17	15.3	12	8.49
Fuel Comb - Residential - Other (million							
\$2019)							
Monetary damages from air pollution -		14.8	14.1	13.3	12.5	11.6	10.8
Fuel Comb - Comm/Institutional - Coal							
(million \$2019)							
Monetary damages from air pollution -		47.1	46	43.7	38.5	30.9	23
Fuel Comb - Comm/Institutional - Natural							
Gas (million \$2019)							
Monetary damages from air pollution -		8.55	7.75	6.99	6.02	4.96	3.96
Fuel Comb - Comm/Institutional - Oil							
(million \$2019)							
Monetary damages from air pollution -		5.01	4.49	3.98	3.49	3.01	2.57
Fuel Comb - Comm/Institutional - Other							
(million \$2019)							
Monetary damages from air pollution -		165	132	132	132	135	133
Industrial Processes - Coal Mining							
[million \$2019]							
Monetary damages from air pollution -		419	369	308	260	223	158
Industrial Processes - Oil & Gas							
Production (million \$2019)							

Table 18: E- scenario - IMPACTS - Jobs

Item	2020	2025	2030	2035	2040	2045	2050
By economic sector - Agriculture (jobs)		253	324	1,077	1,898	2,008	1,174
By economic sector - Construction (jobs)		5,832	13,147	14,234	15,836	25,674	30,398
By economic sector - Manufacturing		4,194	4,612	5,221	5,983	7,021	7,198
(jobs)							
By economic sector - Mining (jobs)		5,205	3,878	3,028	2,309	1,862	1,279
By economic sector - Other (jobs)		288	1,628	1,668	2,240	4,782	6,365
By economic sector - Pipeline (jobs)		669	978	1,137	878	901	956
By economic sector - Professional (jobs)		3,825	5,573	6,671	9,254	13,552	14,208

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

Item	2020	2025	2030	2035	2040	2045	2050
By economic sector - Trade (jobs)		2.922	3.995	4.188	5.237	8.222	9.518
By economic sector - Utilities (jobs)		10.426	13.084	15.570	16.125	21.366	24,728
By resource sector - Biomass (iobs)		959	871	3.576	7.984	8.551	4.842
By resource sector - CO2 (jobs)		6.76	3.786	6.075	4.507	5.405	6.547
By resource sector - Coal (jobs)		3.293	1.809	1.499	1.314	1.185	1.044
By resource sector - Grid (inhs)		10 169	13 922	17455	20.538	33 442	40 911
By resource sector - Natural Gas (inhs)		8 949	7082	6 080	5 811	4 544	3 9 3 9
By resource sector - Nuclear (jobs)		2 660	2 618	2 576	2 081	1 001	414
By resource sector - Oil (jobs)		6 294	5 425	4 694	3 918	3 151	1913
By resource sector - Solar (jobs)		592	10 729	9754	12 488	26.862	34 405
By resource sector - Wind (iobs)		691	978	1 084	1 119	1 245	1808
By education level - All sectors - High		13 971	20 132	22 675	25 708	36 823	41 233
school dinloma or less (iohs)		10,711	20,102	22,010	20,100	00,020	41,200
By education level - All sectors -		10 316	14 921	16 628	18 555	26.992	30.934
Associates degree or some college (inhs)		10,510	14,721	10,020	10,000	20,772	30,734
By education level - All sectors -		7307	9 515	10 529	12 012	16 686	18 334
By concerner (inhs)		1,001	2,010	10,027	12,012	10,000	10,004
By education level - All sectors - Masters		1781	2 326	2 598	3 030	4 245	4 645
or professional degree (jobs)		1,101	2,520	2,570	3,030	4,240	4,040
By education level - All sectors - Doctoral		240	325	364	454	641	678
degree (inhe)		240	525	504	404	041	010
Belated work experience - All sectors -		1,766	6.8/10	7707	8 778	12 612	1/, 20/,
None (inhs)		4,100	0,040	1,1 2 1	0,110	12,012	14,204
Related work experience - All sectors - Un		6.470	9 371	10 570	12 244	17.603	19 579
to 1 year (jobe)		0,410	2,011	10,510	12,244	11,000	17,017
Related work experience - All sectors - 1		12 388	17 0 9/1	19.057	21/.76	30 565	3/, 289
to 4 years (inhs)		12,500	11,074	17,001	21,410	30,303	54,207
Related work experience - All sectors - 4		7860	11 021	12 246	13 706	19 591	22 116
to 10 years (jobs)		1,000	11,021	12,240	10,100	17,071	22,110
Related work experience - All sectors -		2 130	2 893	3 193	3 556	5 016	5 636
Over 10 years (inhs)		2,100	2,075	3,173	3,550	3,010	5,050
On-the- Joh Training - All sectors - None		1783	2 5 3 7	2 805	3 2 3 3	4 660	5 207
(inhs)		1,100	2,001	2,000	0,200	4,000	0,201
On-the- Joh Training - All sectors - Un to 1		22 399	30.785	34 560	30 700	55 907	62 119
vear (inhs)		22,077	00,100	04,000	07,477	00,701	02,117
On-the-Joh Training - All sectors - 1 to 4		7 014	10 131	11 245	12 416	17981	20 584
vears (inhs)		1,011	10,101	11,2 10	12, 110	11,701	20,001
On-the-Joh Training - All sectors - 4 to 10		2 119	3 314	3 693	4 070	6 059	7.030
vears (inbs)		2,,	0,011	0,070	1,010	0,007	1,000
On-the-Joh Training - All sectors - Over 10		300	451	489	541	781	884
vears (inhs)		000	-01	407	041	101	004
On-Site or In-Plant Training - All sectors -		5 294	7.537	8 435	9 651	13 804	15 423
None (iobs)		0,271	1,001	0,100	7,001	10,001	10,120
On-Site or In-Plant Training - All sectors -		20.389	28 071	31 4 4 6	35 812	50 796	56 604
Un to 1 year (iohs)		20,007	20,011	01,110	00,012	00,170	00,001
On-Site or In-Plant Training - All sectors -		5.448	7.839	8,708	9.651	13,961	15,939
1 to 4 vears (iobs)		5,115	.,	5,.00	,,001	.0,, 01	.5,707
On-Site or In-Plant Training - All sectors -		2 213	3 366	3744	4 129	6 072	6 9 8 9
4 to 10 years (jobs)		2,210	2,000	5,144	T1127	5,012	5,707
On-Site or In-Plant Training - All sectors -		270	406	460	515	756	870
Over 10 vears (jobs)		2.5			0.0	100	0.0
Wage income - All (million \$2019)		1.800	2.477	2.801	3.188	4.554	5.157
	1	.,	,	_,	5,	.,	51.5.

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

Item	2020	2025	2030	2035	2040	2045	2050
Final energy use - Transportation (PJ)	546	513	465	427	397	363	322
Final energy use - Residential (PJ)	163	154	147	140	131	121	113
Final energy use - Commercial (PJ)	116	116	115	113	110	107	105
Final energy use - Industry (PJ)	551	582	616	613	638	655	660

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

	<u>,.</u> 1		,				
Item	2020	2025	2030	2035	2040	2045	2050
Electricity distribution capital invested - Cumulative 5-yr (billion \$2018)		3.04	3.04	3.84	3.93	5.22	5.46

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

Item	2020	2025	2030	2035	2040	2045	2050
Vehicle stocks - LDV – EV (1000 units)	9.94	138	265	856	1,447	2,756	4,064
Vehicle stocks - LDV – All others (1000 units)	5,312	5,312	5,312	5,039	4,766	3,672	2,579
Light-duty vehicle capital costs vs. REF - Cumulative 5-yr (million \$2018)		0	163	347	1,168	3,685	5,365
Public EV charging plugs - DC Fast (1000 units)	0.07		0.612		3.34		9.39
Public EV charging plugs - L2 (1000 units)	0.285		14.7		80.3		225

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

Item	2020	2025	2030	2035	2040	2045	2050
Sales of space heating units - Electric	34.1	42.7	46.3	56.9	72.9	83.2	86.8
Heat Pump (%)							
Sales of space heating units - Electric	32.6	33.8	31.7	25.8	17	11.4	9.4
Resistance (%)							
Sales of space heating units - Gas (%)	27	16.4	15.2	12.1	7.04	3.65	2.47
Sales of space heating units - Fossil (%)	6.33	7.13	6.71	5.24	3.12	1.79	1.34
Sales of water heating units - Electric	0	2.09	8.02	25.1	51.3	68.4	74.3
Heat Pump (%)							
Sales of water heating units - Electric	72.5	80.9	76.2	62.3	41.2	27.4	22.6
Resistance (%)							
Sales of water heating units - Gas Furnace	23.5	14.4	13.2	9.97	4.91	1.56	0.408
(%)							
Sales of water heating units - Other (%)	3.93	2.64	2.61	2.64	2.65	2.64	2.64
Sales of cooking units - Electric	83.6	84	85.5	89.5	95	98.4	99.6
Resistance (%)							
Sales of cooking units - Gas (%)	16.4	16	14.5	10.5	5.01	1.62	0.435
Residential HVAC investment in 2020s vs.		3.81	4.31				
REF - Cumulative 5-yr (billion \$2018)							

Table 23: E- scenario - PILLAR 1: Effi	iciencv/Electrification - Co	mmercial
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Item	2020	2025	2030	2035	2040	2045	2050
Sales of space heating units - Electric	11.7	20.3	25.7	41.5	66.1	83.2	89.6
Heat Pump (%)							
Sales of space heating units - Electric	5.83	4.63	4.65	4.79	5.28	5.94	6.33
Resistance (%)							
Sales of space heating units - Gas Furnace	82.5	71.7	66.5	51.3	27.4	10.5	3.93
(%)							
Sales of space heating units - Fossil (%)	0	3.35	3.16	2.4	1.19	0.387	0.102
Sales of water heating units - Electric	0.191	1.96	7.08	21.8	44.4	59.2	64.3
Heat Pump (%)							
Sales of water heating units - Electric	7.05	6.58	8.46	14.5	23.6	29.5	31.6
Resistance (%)							
Sales of water heating units - Gas Furnace	90.8	89.9	82.9	62.1	30.4	9.73	2.53
(%)							
Sales of water heating units - Other (%)	1.97	1.59	1.58	1.59	1.59	1.58	1.57
Sales of cooking units - Electric	43.5	47.1	51.3	61.6	76.1	85	88
Resistance (%)							
Sales of cooking units - Gas (%)	56.5	52.9	48.7	38.4	23.9	15	12
Commercial HVAC investment in 2020s -		13,551	15,374				
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)	4,966	0	0	0	0	0	0
Installed thermal - Natural gas (MW)	12,572	16,324	16,188	15,400	12,554	11,637	13,232
Installed thermal - Nuclear (MW)	5,270	5,270	5,270	5,270	2,966	888	888

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

Carbon sink potential - Low - Accelerate regeneration (1000 t0202/v) 170 Carbon sink potential - Low - Avoid carbon sink potential - Low - Extend rotation length (1000 t022/v) 313 Carbon sink potential - Low - Extend rotation length (1000 t022/v) 3133 Darbon sink potential - Low - Increase retention of HWP (1000 t022/v) 3133 Carbon sink potential - Low - Increase retention of HWP (1000 t022/v) -7.484 Carbon sink potential - Low - Increase retention of HWP (1000 t022/v) -7.484 Carbon sink potential - Low - Reforest rese outside forests (1000 t022/v) -7.1524 Carbon sink potential - Low - Reforest rese outside forests (1000 t022/v) -1.524 Carbon sink potential - Low - Reforest rese outside forest (1000 t022/v) -1.524 Carbon sink potential - Low - Reforest productivity (1000 t022/v) -1.524 Carbon sink potential - Low - Reforest regeneration (1000 t022/v) -1.873 Carbon sink potential - Low - All (not counting overlap) (1000 t022/v) -1.873 Carbon sink potential - Low - All (not counting overlap) (1000 t022/v) -1.524 Carbon sink potential - Mid - Accelerate regeneration (1000 t022/v) -1.1673 Carbon sink potential - Mid - Extend rotation length (1000 t022/v) -1.100 Carbon sink potential - Mid - Increase retention of HWP (1000 t022/v) -4.591 <th>Item</th> <th>2020</th> <th>2025</th> <th>2030</th> <th>2035</th> <th>2040</th> <th>2045</th> <th>2050</th>	Item	2020	2025	2030	2035	2040	2045	2050
regeneration (1000 (1002e/v) Carbon sink potential - Low - Avoid deforestation (1000 (1002e/v) Carbon sink potential - Low - Extend rotation length (1000 (1002e/v) Carbon sink potential - Low - Increase retention of HWP (1000 (1002e/v) Carbon sink potential - Low - Increase retention of HWP (1000 (1002e/v) Carbon sink potential - Low - Reforest craptand (1000 (1002e/v) Carbon sink potential - Low - Reforest craptand (1000 (1002e/v) Carbon sink potential - Low - Reforest craptand (1000 (1002e/v) Carbon sink potential - Low - Reforest carbon sink potential - Mid - Accelerate Pregeneration (1000 t002e/v) Carbon sink potential - Mid - Accelerate Carbon sink potential - Mid - Ketend rotation length (1000 t002e/v) Carbon sink potential - Mid - Increase regeneration (1000 t002e/v) Carbon sink potential - Mid - Reforest Carbon sink potential - High - Axoid deforestation (1000 t002e/v) Carbon sin	Carbon sink potential - Low - Accelerate							-170
Carbon sink potential - Low - Avoid 317 Garbon sink potential - Low - Extend -4,448 rotation length (1000 tC02e/y) 3133 Garbon sink potential - Low - Improve -3,133 plantations (1000 tC02e/y) -7,484 Carbon sink potential - Low - Increase -7,484 retention of HWP (1000 tC02e/y) -207 Carbon sink potential - Low - Increase -207 Carbon sink potential - Low - Reforest -207 corpland (1000 tC02e/y) -1,524 Carbon sink potential - Low - Reforest -531 pasture (1000 tC02e/y) -1,527 Carbon sink potential - Low - Reforest -531 carbon sink potential - Low - Reforest -531 Garbon sink potential - Low - Reforest -1,573 carbon sink potential - Low - Reforest -255 carbon sink potential - Mid - Accelerate -255 regeneration (1000 tC02e/y) -255 Carbon sink potential - Mid - Accelerate -4,591 carbon sink potential - Mid - Accelerate -4,591 regeneration (1000 tC02e/y) -44,591 Carbon sink potential - Mid - Extend -44,591 retention of HWP (1000 tC02e	regeneration (1000 tCO2e/y)							
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Carbon sink potential - Low - Extend -4,448 Carbon sink potential - Low - Improve -3,133 plantations (1000 tC02e/y) -7,484 Carbon sink potential - Low - Increase -7,484 retention of HWP (1000 tC02e/y) -207 Carbon sink potential - Low - Increase -207 Carbon sink potential - Low - Increase -207 Carbon sink potential - Low - Reforest -207 Carbon sink potential - Low - Reforest -531 pasture (1000 tC02e/y) -531 Carbon sink potential - Low - Reforest -531 productivity (1000 tC02e/y) -1,524 Carbon sink potential - Low - Reforest -1,873 productivity (1000 tC02e/y) -1,9687 Carbon sink potential - Mid - Accelerate -255 regeneration (1000 tC02e/y) -255 Carbon sink potential - Mid - Accelerate -2,511 Carbon sink potential - Mid - Accelerate -4,6191	deforestation (1000 tCO2e/y)							
rotation length (1000 tC02e/v) Carbon sink potential - Low - Increase retention of HWP (1000 tC02e/v) Carbon sink potential - Low - Increase retention of HWP (1000 tC02e/v) Carbon sink potential - Low - Reforest cropland (1000 tC02e/v) Carbon sink potential - Low - All (not carbon sink potential - Low - All (not carbon sink potential - Mid - Accelerate regeneration (1000 tC02e/v) Carbon sink potential - Mid - Accelerate regeneration (1000 tC02e/v) Carbon sink potential - Mid - Accelerate regeneration (1000 tC02e/v) Carbon sink potential - Mid - Increase retention of HWP (1000 tC02e/v) Carbon sink potential - Mid - Increase cropland (1000 tC02e/v) Carbon sink potential - Mid - Reforest cropland (1000 tC02e/v) Carbon	Carbon sink potential - Low - Extend							-4,448
Carbon sink potential - Low - Improve plantations (1000 t022e/y) -3.133 Carbon sink potential - Low - Increase retention of HWP (1000 t022e/y) -7.484 Carbon sink potential - Low - Increase retention of HWP (1000 t022e/y) -207 Carbon sink potential - Low - Reforest corpland (1000 t022e/y) -1.524 Carbon sink potential - Low - Reforest pasture (1000 t022e/y) -1.524 Carbon sink potential - Low - Reforest counting overhal) (1000 t022e/y) -1.873 Carbon sink potential - Low - Reforest pasture (1000 t022e/y) -1.9687 Carbon sink potential - Low - Relorest regeneration (1000 t022e/y) -1.9687 Carbon sink potential - Mid - Accelerate regeneration (1000 t022e/y) -255 Carbon sink potential - Mid - Accelerate regeneration (1000 t022e/y) -255 Carbon sink potential - Mid - Accelerate regeneration (1000 t022e/y) -24,591 Carbon sink potential - Mid - Facend retention flow potential - Mid - Facend retention flow potential - Mid - Increase retention of HWP (1000 t022e/y) -400 Carbon sink potential - Mid - Increase retention of HWP (1000 t022e/y) -2286 Carbon sink potential - Mid - Increase retention of HWP (1000 t022e/y) -3768 Carbon sink potential - Mid - Reforest reparation (1000 t022e/y) -3768 Carbon sink potential - Mid - Reforest productivity (1000 t022e/y) -37	rotation length (1000 tCO2e/y)							
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Carbon sink potential - Low - Increase -7,484 Carbon sink potential - Low - Increase -207 trees outside forests (1000 tC02e/v) -31524 Carbon sink potential - Low - Reforest -531 pasture (1000 tC02e/v) -531 Carbon sink potential - Low - Reforest -531 productivity (1000 tC02e/v) -1,1524 Carbon sink potential - Low - Reforest -1,1573 productivity (1000 tC02e/v) -1,1673 Carbon sink potential - Low - Reforest -1,9,687 counting overlap] (1000 tC02e/v) -255 Carbon sink potential - Mid - Accelerate -255 regeneration (1000 tC02e/v) -1,110 deforestation (1000 tC02e/v) -1,110 Carbon sink potential - Mid - Accelerate -255 regeneration (1000 tC02e/v) -4,591 Carbon sink potential - Mid - Accelerate -4,591 plantations (1000 tC02e/v) -4,591 Carbon sink potential - Mid - Eforest -400 trestention of HWP (1000 tC02e/v) -14,968 Carbon sink potential - Mid - Increase -2,2286 carbon sink potential - Mid - Reforest -2,2286 carbon sink potential -	plantations (1000 tCO2e/y)							
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Carbon sink potential - Low - Increase -207 trees outside forests (1000 tCD2e/y) -1,524 Carbon sink potential - Low - Reforest -1,524 Carbon sink potential - Low - Reforest -531 pasture (1000 tCD2e/y) -1,873 Carbon sink potential - Low - Reforest -1,873 productivity (1000 tCD2e/y) -19,687 Carbon sink potential - Low - All (not -255 regeneration (1000 tCD2e/y) -255 Carbon sink potential - Mid - Accelerate -255 regeneration (1000 tCD2e/y) -255 Carbon sink potential - Mid - Avoid -1,110 deforestation (1000 tCD2e/y) -255 Carbon sink potential - Mid - Avoid -1,110 deforestation (1000 tCD2e/y) -4,591 Carbon sink potential - Mid - Improve -4,591 plantations (1000 tCD2e/y) -4,591 Carbon sink potential - Mid - Improve -4,591 plantations (1000 tCD2e/y) -4,591 Carbon sink potential - Mid - Reforest -2,286 cropland (1000 tCD2e/y) -4000 Carbon sink potential - Mid - Reforest -3,768 pasture (10000 tCD2e/y) -3,768	retention of HWP (1000 tCO2e/y)							
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Carbon sink potential - Low - Reforest -1,524 Carbon sink potential - Low - Reforest -531 pasture (1000 tCO2e/y) -1,873 Carbon sink potential - Low - Reforest -1,873 productivity (1000 tCO2e/y) -1,873 Carbon sink potential - Low - Reforest -1,873 productivity (1000 tCO2e/y) -19,687 Carbon sink potential - Mid - Accelerate -255 regeneration (1000 tCO2e/y) -1,110 Carbon sink potential - Mid - Accelerate -255 regeneration (1000 tCO2e/y) -1,110 Carbon sink potential - Mid - Accelerate -255 regeneration (1000 tCO2e/y) -1,110 Carbon sink potential - Mid - Extend -1,110 rotation length (1000 tCO2e/y) -4,551 Carbon sink potential - Mid - Increase -14,968 retention of HWP (1000 tCO2e/y) -4,551 Carbon sink potential - Mid - Increase -4,000 trees outside forests (1000 tCO2e/y) -4,000 Carbon sink potential - Mid - Increase -4,000 trees outside forests (1000 tCO2e/y) -2,286 Carbon sink potential - Mid - Reforest -3,768 productivit (1000	trees outside forests (1000 tCO2e/y)							
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Carbon sink potential - Low - Reforest pasture (1000 tCO2e/y) -531 Carbon sink potential - Low - Restore productivity (1000 tCO2e/y) -1,873 Carbon sink potential - Low - All (not counting overlap) (1000 tCO2e/y) -19,687 Carbon sink potential - Mid - Accelerate regeneration (1000 tCO2e/y) -255 Carbon sink potential - Mid - Accelerate regeneration (1000 tCO2e/y) -1,110 Carbon sink potential - Mid - Avoid deforestation (1000 tCO2e/y) -1,110 Carbon sink potential - Mid - Extend rotation length (1000 tCO2e/y) -8,014 Carbon sink potential - Mid - Increase retention of HWP (1000 tCO2e/y) -4,591 Carbon sink potential - Mid - Increase retention of HWP (1000 tCO2e/y) -14,968 Carbon sink potential - Mid - Increase -4,000 Teres outside forests (1000 tCO2e/y) -2,286 Carbon sink potential - Mid - Reforest eropland (1000 tCO2e/y) -3,768 Carbon sink potential - Mid - Reforest pasture (1000 tCO2e/y) -3,716 Carbon sink potential - Mid - Reforest productivity (1000 tCO2e/y) -3,716 Carbon sink potential - Mid - Reforest pasture (1000 tCO2e/y) -3,716 Carbon sink potential - Mid - Restore eropland (1000 tCO2e/y) -3,716 Carbon sink potential - Mid - Restore -3,715 productivity (1000 tCO	cropland (1000 tCO2e/y)							
pasture (1000 tC02e/y) -1,873 Carbon sink potential - Low - Restore -19,687 Carbon sink potential - Nid - Accelerate -255 regeneration (1000 tC02e/y) -255 Carbon sink potential - Mid - Accelerate -255 regeneration (1000 tC02e/y) -1,110 Carbon sink potential - Mid - Accelerate -255 regeneration (1000 tC02e/y) -1,110 Carbon sink potential - Mid - Extend -1,170 Carbon sink potential - Mid - Improve -4,591 Planations (1000 tC02e/y) -4,691 Carbon sink potential - Mid - Improve -4,591 Planations (1000 tC02e/y) -4,691 Carbon sink potential - Mid - Increase -4,001 retention of HWP (1000 tC02e/y) -4,000 Carbon sink potential - Mid - Increase -4,000 reteston of HWP (1000 tC02e/y) -4,000 Carbon sink potential - Mid - Reforest -2,286 cropland (1000 tC02e/y) -3,716 Carbon sink potential - Mid - Reforest -3,716 productivity (1000 tC02e/y) -3,715 Carbon sink potential - Mid - Accelerate -3,716 productivity (1000 tC02e/y) -3	Carbon sink potential - Low - Reforest							-531
Carbon sink potential - Low - Restore productivity (1000 tC02e/y) -1,873 Carbon sink potential - Low - All (not counting overlap) (1000 tC02e/y) -19,687 Carbon sink potential - Mid - Accelerate regeneration (1000 tC02e/y) -255 Carbon sink potential - Mid - Avoid deforestation (1000 tC02e/y) -1,110 Carbon sink potential - Mid - Avoid deforestation (1000 tC02e/y) -1,110 Carbon sink potential - Mid - Stend rotation length (1000 tC02e/y) -4,591 Carbon sink potential - Mid - Improve plantations (1000 tC02e/y) -4,591 Carbon sink potential - Mid - Increase -4,591 Carbon sink potential - Mid - Increase -4,00 trees outside forests (1000 tC02e/y) -4,00 Carbon sink potential - Mid - Reforest -2,286 coropland (1000 tC02e/y) -2,286 Carbon sink potential - Mid - Reforest -3,768 pasture (1000 tC02e/y) -3,768 Carbon sink potential - Mid - Reforest -3,715 productivity (1000 tC02e/y) -3,768 Carbon sink potential - Mid - Accelerate -3,716 productivity (1000 tC02e/y) -3,716 Carbon sink potential - Mid - Accelerate -3,716 productivity (1000 tC02e/y) -3,716	pasture (1000 tCO2e/y)							
productivity (1000 tC02e/y) 19,687 Carbon sink potential - Low - All (not counting overlap) (1000 tC02e/y) -255 Carbon sink potential - Mid - Accelerate regeneration (1000 tC02e/y) -255 Carbon sink potential - Mid - Accelerate regeneration (1000 tC02e/y) -1,110 Carbon sink potential - Mid - Stend rotation length (1000 tC02e/y) -4,591 Carbon sink potential - Mid - Improve plantations (1000 tC02e/y) -4,591 Carbon sink potential - Mid - Improve plantations (1000 tC02e/y) -4,591 Carbon sink potential - Mid - Increase -4,591 retention of HWP (1000 tC02e/y) -2,286 Carbon sink potential - Mid - Increase -2,286 retention of HWP (1000 tC02e/y) -2,286 Carbon sink potential - Mid - Reforest -2,286 cropland (1000 tC02e/y) -3,768 pasture (1000 tC02e/y) -3,715 Carbon sink potential - Mid - Restore productivity (1000 tC02e/y) -3,716 Carbon sink potential - Mid - All (not counting overlaa) (1000 tC02e/y) -3,710 Carbon sink potential - Mid - All (not counting overlaa) (1000 tC02e/y) -3,710 Carbon sink potential - High - Axoid deforestation (1000 tC02e/y) -1,902 Carbon s	Carbon sink potential - Low - Restore							-1,873
Carbon sink potential - Low - All (not counting overlap) (1000 tC02e/y) -19,687 Carbon sink potential - Mid - Accelerate regeneration (1000 tC02e/y) -255 Carbon sink potential - Mid - Avoid deforestation (1000 tC02e/y) -1,110 Carbon sink potential - Mid - Avoid -1,110 Carbon sink potential - Mid - Extend rotation length (1000 tC02e/y) -8,014 Carbon sink potential - Mid - Improve plantations (1000 tC02e/y) -4,591 Carbon sink potential - Mid - Increase -14,968 retention of HWP (1000 tC02e/y) -14,968 Carbon sink potential - Mid - Increase -44,00 trees outside forests (1000 tC02e/y) -400 Carbon sink potential - Mid - Increase -400 trees outside forests (1000 tC02e/y) -2,286 Carbon sink potential - Mid - Reforest -3,768 pasture (1000 tC02e/y) -3,715 Carbon sink potential - Mid - Reforest -3,715 productivity (1000 tC02e/y) -3,715 Carbon sink potential - Mid - All (not counting overlap) (1000 tC02e/y) -3,9107 Carbon sink potential - High - Avoid deforestation (1000 tC02e/y) -1,902 Carbon sink potential - High - Avoid deforestation (1000 tC02e/y) -1,902 Carbon sink potential	productivity (1000 tCO2e/y)							
counting overlap) (1000 tCO2e/y) 255 Carbon sink potential - Mid - Accelerate -255 regeneration (1000 tCO2e/y) -1,110 Carbon sink potential - Mid - Avoid -1,110 deforestation (1000 tCO2e/y) -8,014 Carbon sink potential - Mid - Extend -8,014 rotation length (1000 tCO2e/y) -4,591 Carbon sink potential - Mid - Improve -4,591 plantations (1000 tCO2e/y) -4,591 Carbon sink potential - Mid - Increase -14,968 retention of HWP (1000 tCO2e/y) -400 Carbon sink potential - Mid - Increase -400 trees outside forests (1000 tCO2e/y) -400 Carbon sink potential - Mid - Reforest -2,286 cropland (1000 tCO2e/y) -2,286 Carbon sink potential - Mid - Reforest -3,768 pasture (1000 tCO2e/y) -3,768 Carbon sink potential - Mid - Reforest -3,715 productivity (1000 tCO2e/y) -3,768 Carbon sink potential - Mid - All (not -39,107 counting overlap) (1000 tCO2e/y) -1,902 Carbon sink potential - High - Avoid -1,902 deforestation (1000 tCO2e/y)	Carbon sink potential - Low - All (not							-19.687
Carbon sink potential - Mid - Accelerate regeneration (1000 tC02e/y) -255 Carbon sink potential - Mid - Avoid deforestation (1000 tC02e/y) -1,110 Carbon sink potential - Mid - Extend rotation length (1000 tC02e/y) -8,014 Carbon sink potential - Mid - Improve plantations (1000 tC02e/y) -4,591 Carbon sink potential - Mid - Increase retention of HWP (1000 tC02e/y) -4,591 Carbon sink potential - Mid - Increase -400 trees outside forests (1000 tC02e/y) -400 Carbon sink potential - Mid - Increase -2,286 cropland (1000 tC02e/y) -2,286 Carbon sink potential - Mid - Reforest -2,286 cropland (1000 tC02e/y) -3,768 Carbon sink potential - Mid - Reforest -3,768 pasture (1000 tC02e/y) -3,715 Carbon sink potential - Mid - Restore -3,716 productivity (1000 tC02e/y) -3,716 Carbon sink potential - Mid - All (not counting overlap) (1000 tC02e/y) -3,710 Carbon sink potential - Mid - All (not counting overlap) (1000 tC02e/y) -3,710 Carbon sink potential - High - Accelerate regeneration (1000 tC02e/y) -3,710 Carbon sink potential - High - Axoid deforestation (1000 tC02e/y) -4,1902 Carbon s	counting overlap) (1000 tCO2e/v)							,
regeneration (1000 ICO2e/y)Image: Construct of the second sec	Carbon sink potential - Mid - Accelerate							-255
Carbon sink potential - Mid - Avoid -1,110 deforestation (1000 tCO2e/y) -8,014 Carbon sink potential - Mid - Extend -8,014 rotation length (1000 tCO2e/y) -4,591 Carbon sink potential - Mid - Improve -4,591 plantations (1000 tCO2e/y) -4,691 Carbon sink potential - Mid - Increase -14,968 retention of HWP (1000 tCO2e/y) -400 Carbon sink potential - Mid - Increase -400 trees outside forests (1000 tCO2e/y) -400 Carbon sink potential - Mid - Reforest -2,286 cropland (1000 tCO2e/y) -3,768 Carbon sink potential - Mid - Reforest -3,768 pasture (1000 tCO2e/y) -3,715 Carbon sink potential - Mid - Reforest -3,715 productivity (1000 tCO2e/y) -3,715 Carbon sink potential - Mid - All (not -3,9107 counting overlap) (1000 tCO2e/y) -3,9107 Carbon sink potential - High - Accelerate -340 regeneration (1000 tCO2e/y) -11,902 Carbon sink potential - High - Accelerate -340 regeneration (1000 tCO2e/y) -1902 Carbon sink potential - High - Avoid	regeneration (1000 tCO2e/v)							200
deforestation (1000 tC02e/y)	Carbon sink potential - Mid - Avoid							-1.110
Carbon sink potential - Mid - Extend rotation length (1000 tCO2e/y)-8.014Carbon sink potential - Mid - Improve plantations (1000 tCO2e/y)-4.591Carbon sink potential - Mid - Increase retention of HWP (1000 tCO2e/y)-14.968Carbon sink potential - Mid - Increase retention of HWP (1000 tCO2e/y)-400Carbon sink potential - Mid - Increase retention of HWP (1000 tCO2e/y)-400Carbon sink potential - Mid - Reforest cropland (1000 tCO2e/y)-400Carbon sink potential - Mid - Reforest pasture (1000 tCO2e/y)-2.286Carbon sink potential - Mid - Reforest pasture (1000 tCO2e/y)-3.768Carbon sink potential - Mid - Restore productivity (1000 tCO2e/y)-3.715Carbon sink potential - Mid - All (not counting overlap) (1000 tCO2e/y)-3.715Carbon sink potential - High - Accelerate regeneration (1000 tCO2e/y)-340Carbon sink potential - High - Accelerate regeneration (1000 tCO2e/y)-11.580Carbon sink potential - High - Avoid deforestation (1000 tCO2e/y)-11.580Carbon sink potential - High - Extend rotation length (1000 tCO2e/y)-11.580Carbon sink potential - High - Improve plantations (1000 tCO2e/y)-22.452Carbon sink potential - High - Improve plantations (1000 tCO2e/y)-22.452	deforestation (1000 tC02e/v)							1,110
Totation length (1000 tC02e/v)Optimized (1000 tC02e/v)Carbon sink potential - Mid - Improve plantations (1000 tC02e/v)-44,591Carbon sink potential - Mid - Increase retention of HWP (1000 tC02e/v)-14,968Carbon sink potential - Mid - Increase trees outside forests (1000 tC02e/v)-400Carbon sink potential - Mid - Increase trees outside forests (1000 tC02e/v)-400Carbon sink potential - Mid - Reforest cropland (1000 tC02e/v)-2,286Carbon sink potential - Mid - Reforest productivity (1000 tC02e/v)-3,768Carbon sink potential - Mid - Reforest productivity (1000 tC02e/v)-3,715Carbon sink potential - Mid - Reforest productivity (1000 tC02e/v)-3,715Carbon sink potential - Mid - Reforest productivity (1000 tC02e/v)-3,715Carbon sink potential - Mid - All (not counting overlap) (1000 tC02e/v)-340Carbon sink potential - High - Accelerate regeneration (1000 tC02e/v)-1,902Carbon sink potential - High - Avoid deforestation (1000 tC02e/v)-1,902Carbon sink potential - High - Avoid deforestation (1000 tC02e/v)-1,902Carbon sink potential - High - Extend rotation length (1000 tC02e/v)-11,580Carbon sink potential - High - Improve plantations (1000 tC02e/v)-6,158Carbon sink potential - High - Improve plantations (1000 tC02e/v)-22,452Carbon sink potential - High - Increase retention of HWP (1000 tC02e/v)-22,452	Carbon sink notential - Mid - Extend							-8 014
Carbon sink potential - Mid - Improve plantations (1000 tC02e/y)-4,591Carbon sink potential - Mid - Increase retention of HWP (1000 tC02e/y)-14,968Carbon sink potential - Mid - Increase trees outside forests (1000 tC02e/y)-400Carbon sink potential - Mid - Increase trees outside forests (1000 tC02e/y)-400Carbon sink potential - Mid - Reforest cropland (1000 tC02e/y)-2,286Carbon sink potential - Mid - Reforest pasture (1000 tC02e/y)-3,768Carbon sink potential - Mid - Reforest pasture (1000 tC02e/y)-3,715Carbon sink potential - Mid - All (not counting overlap) (1000 tC02e/y)-3,715Carbon sink potential - High - Accelerate regeneration (1000 tC02e/y)-340Carbon sink potential - High - Accelerate regeneration (1000 tC02e/y)-340Carbon sink potential - High - Avoid deforestation (1000 tC02e/y)-11,580Carbon sink potential - High - Avoid deforestation length (1000 tC02e/y)-11,580Carbon sink potential - High - Extend rotation length (1000 tC02e/y)-22,452Carbon sink potential - High - Increase plantations (1000 tC02e/y)-22,452	rotation length (1000 tCO2e/v)							0,011
DistributionsInterviewplantations(100) tCO2e/y)Carbon sink potential - Mid - Increase-14,968retention of HWP (1000 tCO2e/y)-400Carbon sink potential - Mid - Increase-400trees outside forests (1000 tCO2e/y)-2,286Carbon sink potential - Mid - Reforest-2,286cropland (1000 tCO2e/y)-3,768Carbon sink potential - Mid - Reforest-3,768pasture (1000 tCO2e/y)-3,715Carbon sink potential - Mid - Restore-3,715productivity (1000 tCO2e/y)-3,715Carbon sink potential - Mid - All (not counting overlap) (1000 tCO2e/y)-39,107Carbon sink potential - High - Accelerate-340regeneration (1000 tCO2e/y)-1,902Carbon sink potential - High - Axoid deforestation (1000 tCO2e/y)-1,902Carbon sink potential - High - Axoid deforestation (1000 tCO2e/y)-1,902Carbon sink potential - High - Increase plantations (1000 tCO2e/y)-6,158Carbon sink potential - High - Increase plantations (1000 tCO2e/y)-22,452	Carbon sink notential - Mid - Improve							-4 591
Carbon sink potential - Mid - Increase retention of HWP (1000 tCO2e/y)-14,968Carbon sink potential - Mid - Increase trees outside forests (1000 tCO2e/y)-400Carbon sink potential - Mid - Reforest cropland (1000 tCO2e/y)-2,286Carbon sink potential - Mid - Reforest pasture (1000 tCO2e/y)-3,768Carbon sink potential - Mid - Reforest pasture (1000 tCO2e/y)-3,768Carbon sink potential - Mid - Restore productivity (1000 tCO2e/y)-3,715Carbon sink potential - Mid - Restore productivity (1000 tCO2e/y)-3,715Carbon sink potential - Mid - All (not counting overlap) (1000 tCO2e/y)-3,9107Carbon sink potential - High - Accelerate regeneration (1000 tCO2e/y)-340Carbon sink potential - High - Accelerate regeneration (1000 tCO2e/y)-340Carbon sink potential - High - Avoid deforestation (1000 tCO2e/y)-11,580Carbon sink potential - High - Extend rotation length (1000 tCO2e/y)-11,580Carbon sink potential - High - Improve plantations (1000 tCO2e/y)-22,452Carbon sink potential - High - Increase retention of HWP (1000 tCO2e/y)-22,452	plantations (1000 tC02e/v)							1,071
Carbon sink potential - Mid - Increase trees outside forests (1000 tC02e/y)-400Carbon sink potential - Mid - Increase trees outside forests (1000 tC02e/y)-400Carbon sink potential - Mid - Reforest cropland (1000 tC02e/y)-2,286Carbon sink potential - Mid - Reforest pasture (1000 tC02e/y)-3,768Carbon sink potential - Mid - Reforest pasture (1000 tC02e/y)-3,768Carbon sink potential - Mid - Restore productivity (1000 tC02e/y)-3,715Carbon sink potential - Mid - Restore productivity (1000 tC02e/y)-3,715Carbon sink potential - Mid - All (not counting overlap) (1000 tC02e/y)-340Carbon sink potential - High - Accelerate regeneration (1000 tC02e/y)-340Carbon sink potential - High - Avoid deforestation (1000 tC02e/y)-1,902Carbon sink potential - High - Avoid deforestation (1000 tC02e/y)-1,902Carbon sink potential - High - Accelerate regeneration (1000 tC02e/y)-11,580Carbon sink potential - High - Inprove plantations (1000 tC02e/y)-6,158Carbon sink potential - High - Inprove plantations (1000 tC02e/y)-22,452	Carbon sink notential - Mid - Increase							-14 968
Carbon sink potential - Mid - Increase trees outside forests (1000 tC02e/y)-400Carbon sink potential - Mid - Reforest cropland (1000 tC02e/y)-2,286Carbon sink potential - Mid - Reforest pasture (1000 tC02e/y)-3,768Carbon sink potential - Mid - Reforest pasture (1000 tC02e/y)-3,715Carbon sink potential - Mid - Restore productivity (1000 tC02e/y)-3,715Carbon sink potential - Mid - Restore productivity (1000 tC02e/y)-3,715Carbon sink potential - Mid - All (not counting overlap) (1000 tC02e/y)-340Carbon sink potential - High - Accelerate regeneration (1000 tC02e/y)-340Carbon sink potential - High - Avoid deforestation [1000 tC02e/y)-1,902Carbon sink potential - High - Extend rotation length (1000 tC02e/y)-11,902Carbon sink potential - High - Extend rotation length (1000 tC02e/y)-11,580Carbon sink potential - High - Improve plantations (1000 tC02e/y)-22,452Carbon sink potential - High - Increase retention of HWP (1000 tC02e/y)-22,452	retention of HWP (1000 tC02e/v)							11,700
Carbon sink potential - Mid - Reforest cropland (1000 tC02e/y)	Carbon sink notential - Mid - Increase							-400
Carbon sink potential - Mid - Reforest cropland (1000 tCO2e/y)-2,286Carbon sink potential - Mid - Reforest pasture (1000 tCO2e/y)-3,768Carbon sink potential - Mid - Restore productivity (1000 tCO2e/y)-3,715Carbon sink potential - Mid - Restore productivity (1000 tCO2e/y)-3,715Carbon sink potential - Mid - All (not counting overlap) (1000 tCO2e/y)-39,107Carbon sink potential - High - Accelerate regeneration (1000 tCO2e/y)-340Carbon sink potential - High - Accelerate regeneration (1000 tCO2e/y)-340Carbon sink potential - High - Avoid deforestation (1000 tCO2e/y)-11,580Carbon sink potential - High - Extend rotation length (1000 tCO2e/y)-11,580Carbon sink potential - High - Improve plantations (1000 tCO2e/y)-6,158Carbon sink potential - High - Increase retention of HWP (1000 tCO2e/y)-22,452	trees outside forests (1000 tC02e/v)							100
Carbon sink potential - Mid - Reforest2,80Carbon sink potential - Mid - Reforest-3,768pasture (1000 tCO2e/y)-3,715Carbon sink potential - Mid - Restore-3,715productivity (1000 tCO2e/y)-39,107Carbon sink potential - Mid - All (not-39,107counting overlap) (1000 tCO2e/y)-340Carbon sink potential - High - Accelerate-340regeneration (1000 tCO2e/y)-340Carbon sink potential - High - Accelerate-340regeneration (1000 tCO2e/y)-11,902Carbon sink potential - High - Avoid-11,580carbon sink potential - High - Extend-11,580rotation length (1000 tCO2e/y)-6,158Carbon sink potential - High - Improve-6,158plantations (1000 tCO2e/y)-22,452Carbon sink potential - High - Increase-22,452	Carbon sink notential - Mid - Reforest							-2 286
Carbon sink potential - Mid - Reforest pasture (1000 tC02e/y)-3,768Carbon sink potential - Mid - Restore productivity (1000 tC02e/y)-3,715Carbon sink potential - Mid - All (not counting overlap) (1000 tC02e/y)-39,107Carbon sink potential - High - All (not counting overlap) (1000 tC02e/y)-340Carbon sink potential - High - Accelerate regeneration (1000 tC02e/y)-340Carbon sink potential - High - Accelerate regeneration (1000 tC02e/y)-1,902Carbon sink potential - High - Avoid deforestation (1000 tC02e/y)-1,902Carbon sink potential - High - Extend rotation length (1000 tC02e/y)-11,580Carbon sink potential - High - Extend rotation length (1000 tC02e/y)-6,158Carbon sink potential - High - Improve plantations (1000 tC02e/y)-6,158Carbon sink potential - High - Increase retention of HWP (1000 tC02e/y)-22,452	cronland (1000 t $CO2e/v$)							2,200
Carbon sink potential - Mid - Restore productivity (1000 tC02e/y)	Carbon sink notential - Mid - Reforest							-3768
DescriptionDescriptionDescriptionCarbon sink potential - Mid - Restore productivity (1000 tCO2e/y)-3,715Carbon sink potential - Mid - All (not counting overlap) (1000 tCO2e/y)-39,107Carbon sink potential - High - Accelerate regeneration (1000 tCO2e/y)-340Carbon sink potential - High - Accelerate regeneration (1000 tCO2e/y)-340Carbon sink potential - High - Avoid deforestation (1000 tCO2e/y)-1,902Carbon sink potential - High - Avoid deforestation (1000 tCO2e/y)-11,580Carbon sink potential - High - Extend rotation length (1000 tCO2e/y)-6,158Carbon sink potential - High - Improve plantations (1000 tCO2e/y)-6,158Carbon sink potential - High - Increase retention of HWP (1000 tCO2e/y)-22,452	nasture (1000 tC02e/v)							0,100
Out born sink potential - Mid RestoreSolutionproductivity (1000 tCO2e/y)-39,107Carbon sink potential - Mid - All (not-39,107counting overlap) (1000 tCO2e/y)-340Carbon sink potential - High - Accelerate-340regeneration (1000 tCO2e/y)-1,902Carbon sink potential - High - Avoid-1,902deforestation (1000 tCO2e/y)-11,580Carbon sink potential - High - Extend-11,580rotation length (1000 tCO2e/y)-6,158Carbon sink potential - High - Improve-6,158plantations (1000 tCO2e/y)-22,452carbon sink potential - High - Increase-22,452	Carbon sink notential - Mid - Restore							-3 715
Producting (1000 tC02e/y)39,107Carbon sink potential - Mid - All (not counting overlap) (1000 tC02e/y)39,107Carbon sink potential - High - Accelerate regeneration (1000 tC02e/y)340Carbon sink potential - High - Avoid deforestation (1000 tC02e/y)1,902Carbon sink potential - High - Avoid deforestation (1000 tC02e/y)-1,902Carbon sink potential - High - Extend rotation length (1000 tC02e/y)-11,580Carbon sink potential - High - Extend rotation length (1000 tC02e/y)-6,158Carbon sink potential - High - Improve plantations (1000 tC02e/y)-6,158Carbon sink potential - High - Increase retention of HWP (1000 tC02e/y)-22,452	nroductivity (1000 tC02e/y)							0,110
Carbon sink potential - High - Accelerate-340regeneration (1000 tC02e/y)-340Carbon sink potential - High - Accelerate-340regeneration (1000 tC02e/y)-1,902Carbon sink potential - High - Avoid deforestation (1000 tC02e/y)-1,902Carbon sink potential - High - Extend rotation length (1000 tC02e/y)-11,580Carbon sink potential - High - Improve plantations (1000 tC02e/y)-6,158Carbon sink potential - High - Improve plantations (1000 tC02e/y)-22,452	Carbon sink notential - Mid - All (not							-39107
Carbon sink potential - High - Accelerate regeneration (1000 tC02e/y)340Carbon sink potential - High - Avoid deforestation (1000 tC02e/y)1,902Carbon sink potential - High - Avoid deforestation length (1000 tC02e/y)1,902Carbon sink potential - High - Extend rotation length (1000 tC02e/y)11,580Carbon sink potential - High - Improve plantations (1000 tC02e/y)6,158Carbon sink potential - High - Improve plantations (1000 tC02e/y)6,252Carbon sink potential - High - Increase retention of HWP (1000 tC02e/y)22,452	counting overlan) (1000 tC02e/v)							07,101
Carbon sink potential - High - Avoid deforestation (1000 tC02e/y)-1,902Carbon sink potential - High - Avoid deforestation (1000 tC02e/y)-1,902Carbon sink potential - High - Extend rotation length (1000 tC02e/y)-11,580Carbon sink potential - High - Improve plantations (1000 tC02e/y)-6,158Carbon sink potential - High - Improve plantations (1000 tC02e/y)-6,158Carbon sink potential - High - Improve plantations (1000 tC02e/y)-22,452	Carbon sink notential - High - Accelerate							-340
Carbon sink potential - High - Avoid -1,902 deforestation (1000 tC02e/y) -1 Carbon sink potential - High - Extend -11,580 rotation length (1000 tC02e/y) -6,158 Carbon sink potential - High - Improve -6,158 plantations (1000 tC02e/y) -22,452 carbon sink potential - High - Increase -22,452	regeneration (1000 tCO2e/v)							040
deforestation (1000 tC02e/y) -11,580 Carbon sink potential - High - Extend rotation length (1000 tC02e/y) -11,580 Carbon sink potential - High - Improve plantations (1000 tC02e/y) -6,158 Carbon sink potential - High - Improve plantations (1000 tC02e/y) -22,452 Carbon sink potential - High - Increase retention of HWP (1000 tC02e/y) -22,452	Carbon sink notential - High - Avoid							-1902
Carbon sink potential - High - Extend -11,580 rotation length (1000 tCO2e/y) -6,158 Carbon sink potential - High - Improve -6,158 plantations (1000 tCO2e/y) -6,22,452 Carbon sink potential - High - Increase -22,452	deforestation (1000 tCO2e/v)							1,702
rotation length (1000 tCO2e/y) -6,158 Carbon sink potential - High - Improve plantations (1000 tCO2e/y) -6,22,452 Carbon sink potential - High - Increase retention of HWP (1000 tCO2e/y) -22,452	Carbon sink notential - High - Extend							-11 580
Carbon sink potential - High - Improve plantations (1000 tC02e/y) -6,158 Carbon sink potential - High - Increase retention of HWP (1000 tC02e/y) -22,452	rotation length (1000 tC02e/v)							1,000
plantations (1000 tC02e/y) -0,100 Carbon sink potential - High - Increase -22,452 retention of HWP (1000 tC02e/y) -22,452	Carbon sink notential - High - Improve							-6 158
Carbon sink potential - High - Increase retention of HWP (1000 tC02e/v)	nlantations (1000 tC02e/v)							0,100
retention of HWP (1000 tC02e/v)	Carbon sink notential - High - Increase							-22 452
	retention of HWP (1000 tC02e/v)							22,402

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink notential - High - Increase							-592
trees outside forests (1000 tC02e/v)							072
Caphan sink natantial High Defenset							2.0/.9
Carbon Sink polential - High - Reforest							-3,040
Carbon sink potential - Hign - Reforest							-7,006
pasture (1000 tCO2e/y)							
Carbon sink potential - High - All (not							-58,635
counting overlap) (1000 tCO2e/y)							
Carbon sink potential - High - Restore							-5,558
productivity (1000 tCO2e/y)							
Land impacted for carbon sink potential -							27.8
Low - Accelerate regeneration (1000							
hertares)							
Land impacted for carbon sink notential							2/.0
Low Avoid defensetation (over 20 verse)							242
(1000 hostores)							
Land impacted for carbon sink potential -							2,262
Low - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							1,134
Low - Improve plantations (1000							
hectares)							
Land impacted for carbon sink potential -							0
Low - Increase retention of HWP (1000							C C
hertares)							
Land impacted for carbon sink notantial							20.6
							27.0
Low - Increase trees outside forests							
(IUUU nectares)							
Land impacted for carbon sink potential -							101
Low - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							34.5
Low - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							1,115
Low - Restore productivity (1000							
hectares)							
Land impacted for carbon sink notential -							4 946
Low - Total impacted (over 30 years)							1,7 10
(1000 bectares)							
Lond imposted for contantial							/17
Lanu impacted for carbon sink potential -							41.7
Mid - Accelerate regeneration (1000							
nectaresj							
Land impacted for carbon sink potential -							250
Mid - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							4,084
Mid - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink notential -							1707
Mid - Improve plantations (1000 bectares)							1,1 0 1
Land impacted for carbon sink notantial							0
Mid Transpoor retention of UND (1000							U
Milu - Increase recención of HWP (1000							
neclaresj							
Land impacted for carbon sink potential -							42.9
Mid - Increase trees outside forests (1000							
hectares)							
Land impacted for carbon sink potential -							151
Mid - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							249
Mid - Reforest pasture (1000 hectares)							
	l		I				

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

Item	2020	2025	2030	2035	2040	2045	2050
Land impacted for carbon sink potential -							2,245
Mid - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							8,770
Mid - Total impacted (over 30 years) (1000							
hectares)							
Land impacted for carbon sink potential -							55.6
High - Accelerate regeneration (1000							
hectares)							
Land impacted for carbon sink potential -							258
High - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							5,905
High - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							2,269
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 -							56.3
High - Increase trees outside forests							
(1000 hectares)							
Land impacted for carbon sink potential -							201
High - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							199
High - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							1,842
High - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							10,786
High - Total impacted (over 30 years)							
(1000 hectares)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Moderate							-57.1
deployment - Corn-ethanol to energy							
grasses (1000 tCO2e/y)							
Carbon sink potential - Moderate							-1,171
deployment - Cropland measures (1000							
tCO2e/y)							
Carbon sink potential - Moderate							-29.1
deployment - Permanent conservation							
cover (1000 tCO2e/y)							
Carbon sink potential - Moderate							-1,257
deployment - Total (1000 tCO2e/y)							
Carbon sink potential - Aggressive							-57.1
deployment - Corn-ethanol to energy							
grasses (1000 tCO2e/y)							
Carbon sink potential - Aggressive							-2,225
deployment - Cropland measures (1000							
tCO2e/y)							
Carbon sink potential - Aggressive							-58.1
deployment - Permanent conservation							
cover (1000 tCO2e/y)							
Carbon sink potential - Aggressive							-2,340
deployment - Total (1000 tCO2e/y)							

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

	no rigriou		nabaj				
Item	2020	2025	2030	2035	2040	2045	2050
Land impacted for carbon sink - Moderate							33
deployment - Corn-ethanol to energy							
grasses (1000 hectares)							
Land impacted for carbon sink - Moderate							528
deployment - Cropland measures (1000							
hectares)							
Land impacted for carbon sink - Moderate							52.8
deployment - Permanent conservation							
cover (1000 hectares)							
Land impacted for carbon sink - Moderate							614
deployment - Total (1000 hectares)							
Land impacted for carbon sink -							33
Aggressive deployment - Corn-ethanol to							
energy grasses (1000 hectares)							
Land impacted for carbon sink -							1,003
Aggressive deployment - Cropland							
measures (1000 hectares)							
Land impacted for carbon sink -							106
Aggressive deployment - Permanent							
conservation cover (1000 hectares)							
Land impacted for carbon sink -							1,142
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 -		39.9	0.054	0.049	0.031	0.019	0.001
Fuel Comb - Electric Generation - Coal							
[deaths]		00.4	17 /	07/	F 0	1.00	0.1.1
Premature deaths from air pollution -		23.4	17.6	9.74	5.9	1.29	0.446
Gas (deaths)							
Premature deaths from air pollution -		111	103	77.4	44.4	20	7.7
Mobile - On-Road (deaths)							
Premature deaths from air pollution - Gas		9.74	8.88	6.63	3.89	1.86	0.853
Stations (deaths)							
Premature deaths from air pollution -		8.94	7.2	4.81	2.71	1.39	0.722
Fuel Comb - Residential - Natural Gas							
(deaths)		0 574	0 / 53	0.011	0.101	0.000	0.001
Premature deaths from air pollution -		0.571	0.457	0.311	0.181	0.083	0.031
Fuel Comb - Residential - Uli (deaths)		0	175	1.01	0.0/1	0 (00	0.0
Premature deaths from air pollution -		2	1.75	1.31	0.841	0.438	0.2
Dremature deaths from air pollution		1 47	1 50	15	1 /.1	1 21	1 0 0
Fuel Comb - Comm/Institutional - Coal		1.07	1.37	1.5	1.41	1.51	1.22
(deaths)							
Premature deaths from air pollution -		5.28	4.61	3.4	2.16	1.32	0.844
Fuel Comb - Comm/Institutional - Natural							
Gas (deaths)							
Premature deaths from air pollution -		0.963	0.796	0.62	0.45	0.307	0.195
Fuel Comb - Comm/Institutional - Oil							
(deaths)							
Premature deaths from air pollution -		0.566	0.473	0.384	0.298	0.217	0.142
Fuel Comb - Comm/Institutional - Other							
(deaths)				17		17.0	
Premature deaths from air pollution -		19.5	14.9	15	14.9	15.2	14.9
Industrial Processes - Goal Mining							
lueatnsj							

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

Item	2020	2025	2030	2035	2040	2045	2050
Dremature deaths from air pollution -	2020	//6.3	//2.8	2000	2040	1/. 8	1.8/
Industrial Pressesses Oil S Cos		40.5	42.0	55.1	20.0	14.0	1.04
Industrial Processes - On & Gas							
Production (deaths)			0 / 01		0.070	0.170	0.010
Monetary damages from air pollution -		354	0.481	0.436	0.278	0.172	0.012
Fuel Comb - Electric Generation - Coal							
(million \$2019)							
Monetary damages from air pollution -		207	156	86.3	52.2	11.5	3.95
Fuel Comb - Electric Generation - Natural							
Gas (million \$2019)							
Monetary damages from air pollution -		985	912	688	394	178	68.5
Mohile - On-Road (million \$2019)						_	
Monetary damages from air pollution -		86.3	78.6	587	34.4	16 5	756
Gas Stations (million \$2019)		00.0	10.0	00.1	04.4	10.0	1.00
Monotony domagos from air pollution		70.2	62.0	1.0.6	2/.	10.0	6 20
Monetal y utiliages in onitial politicities		17.5	03.0	42.0	24	12.3	0.37
Fuel Comb - Residential - Natural Gas							
Monetary damages from air pollution -		5.06	4.05	2.75	1.61	0.733	0.273
Fuel Comb - Residential - Oil (million							
\$2019)							
Monetary damages from air pollution -		17.7	15.5	11.6	7.46	3.88	1.77
Fuel Comb - Residential - Other (million							
\$2019)							
Monetary damages from air pollution -		14.8	14.1	13.3	12.5	11.6	10.8
Fuel Comb - Comm/Institutional - Coal							
(million \$2019)							
Monetary damages from air pollution -		46.7	40.8	30.1	19.1	11.7	7.47
Fuel Comb - Comm/Institutional - Natural							
Gas (million \$2019)							
Monetary damages from air pollution -		8 5 3	7.05	5 /.0	3.08	0.70	173
Fuel Comb. Comm/Institutional. Oil		0.00	1.05	5.47	5.70	2.12	1.15
(million #0010)							
		F 01	/ 10	0.1	0.(1	1.00	1.0/
Monetary damages from air pollution -		5.01	4.19	3.4	2.64	1.92	1.26
Fuel Comb - Comm/Institutional - Other							
(million \$2019)							
Monetary damages from air pollution -		172	132	132	132	134	131
Industrial Processes - Coal Mining							
(million \$2019)							
Monetary damages from air pollution -		411	380	317	225	132	16.4
Industrial Processes - Oil & Gas							
Production (million \$2019)							
					1	1	

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

Item	2020	2025	2030	2035	2040	2045	2050
By economic sector - Agriculture (jobs)		209	433	629	1,025	1,255	1,170
By economic sector - Construction (jobs)		8,253	10,487	19,029	26,937	39,404	53,513
By economic sector - Manufacturing		4,527	5,004	6,226	6,924	8,542	10,706
(jobs)							
By economic sector - Mining (jobs)		5,158	3,678	2,611	1,691	1,062	567
By economic sector - Other (jobs)		672	1,255	3,385	5,630	9,393	13,225
By economic sector - Pipeline (jobs)		648	539	377	240	129	60.7
By economic sector - Professional (jobs)		4,734	5,331	8,654	12,592	18,910	25,694
By economic sector - Trade (jobs)		3,423	3,619	5,744	8,264	12,749	17,846
By economic sector - Utilities (jobs)		12,437	12,290	14,769	17,986	24,810	38,233
By resource sector - Biomass (jobs)		812	1,222	1,692	3,347	4,662	5,148
By resource sector - CO2 (jobs)		0	0	0	0	0	0
By resource sector - Coal (jobs)		3,207	1,715	1,496	1,309	1,184	1,035
By resource sector - Grid (jobs)		13,425	15,223	22,398	31,565	46,940	74,927
By resource sector - Natural Gas (jobs)		9,766	7,879	6,292	5,346	4,006	3,892
By resource sector - Nuclear (jobs)		2,660	2,618	1,697	252	0	0
By resource sector - Oil (jobs)		6,245	5,134	3,899	2,414	1,254	175

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

Item 202	0 2025	2030	2035	2040	2045	2050
By resource sector - Solar (inhs)	3 197	7758	22 236	35 254	56 194	73 012
By resource sector - Wind (jobs)	748	1,100	1714	1803	2 013	2 825
By education level - All sectors - High	16 720	18 055	26 / 21	35 132	50.075	69.026
school diploma or less (jobs)	10,129	10,000	20,431	55,152	30,013	07,020
By education level. All sectors	12 / 40	12 22/.	10 520	26 020	277.20	E2 208
By euloalion level - An sector's -	12,409	13,334	19,529	20,030	51,420	52,206
Associates degree of some conege (jobs)	0,400	0.705	10.005	15 570	00.000	20 70 9
By education level - All sectors -	8,498	8,785	12,025	15,579	22,200	30,708
Bachelor's degree (Jobs)	0.000	01/1	0.007	0.0/ 0	F (0 (7000
By education level - All sectors - Masters	2,082	2,161	2,997	3,943	5,684	7,888
or professional degree (jobs)						
By education level - All sectors - Doctoral	283	302	441	598	875	1,184
degree (jobs)						
Related work experience - All sectors -	5,717	6,136	8,945	11,947	17,150	23,830
None (jobs)						
Related work experience - All sectors - Up	7,761	8,452	12,547	16,819	24,153	33,182
to 1 year (jobs)						
Related work experience - All sectors - 1	14,687	15,493	22,068	29,069	41,502	57,541
to 4 years (jobs)						
Related work experience - All sectors - 4	9,382	9,918	14,179	18,678	26,673	37,054
to 10 years (jobs)						
Related work experience - All sectors -	2,513	2,638	3,684	4,775	6,775	9,407
Over 10 years (jobs)						
On-the-Job Training - All sectors - None	2,125	2,284	3,348	4,470	6,470	8,915
(jobs)						
On-the-Job Training - All sectors - Up to 1	26,472	28,076	40,048	52,831	75,420	104,228
year (jobs)						
On-the-Job Training - All sectors - 1 to 4	8,467	9,017	13,093	17,332	24,776	34,525
years (jobs)						
On-the-Job Training - All sectors - 4 to 10	2,636	2,863	4,344	5,883	8,486	11,855
years (jobs)						
On-the-Job Training - All sectors - Over 10	362	397	590	774	1,101	1,492
years (jobs)						
On-Site or In-Plant Training - All sectors -	6,325	6,803	9,919	13,197	18,953	26,105
None (iobs)	-,	-,	,	-,	-,	-,
On-Site or In-Plant Training - All sectors -	24.122	25.553	36,455	48.077	68,643	94,983
Up to 1 year (iobs)	,					.,
On-Site or In-Plant Training - All sectors -	6.562	6.995	10,156	13,446	19,220	26,755
1 to 4 years (inhs)	0,001	0,770		,	,==0	_0,.00
On-Site or In-Plant Training - All sectors -	2 721	2 9 2 7	4 358	5 849	8 402	11 716
4 to 10 years (jobs)		2,721	.,	0,0 //	0, 102	,0
On-Site or In-Plant Training - All sectors -	332	359	534	721	1036	1455
Over 10 years (inhs)	002	007	004	121	1,000	1,400
Wage income - All (million \$2019)	2 104	2 252	3 102	1, 225	6 090	8 590
waye meeting - All (minion #2017)	2,120	2,200	3,173	4,220	0,070	0,070

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

Item	2020	2025	2030	2035	2040	2045	2050
Final energy use - Transportation (PJ)	546	508	443	365	294	250	232
Final energy use - Residential (PJ)	163	153	141	126	114	108	105
Final energy use - Commercial (PJ)	116	116	112	106	101	99.4	100
Final energy use - Industry (PJ)	551	582	615	609	632	649	656

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

	//						
Item	2020	2025	2030	2035	2040	2045	2050
Electricity distribution capital invested -		3.72	3.8	5.83	6.14	5	5.13
Cumulative 5-yr (billion \$2018)							

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

Itom	2020		2020	2025	20//0	2076	2050
116111	2020	2025	2030	2035	2040	2045	2050
Vehicle stocks - LDV – EV (1000 units)	12.8	447	881	2,399	3,918	5,132	6,345
Vehicle stocks - LDV – All others (1000	5,291	5,038	4,785	3,487	2,189	1,238	288
units)							
Light-duty vehicle capital costs vs. REF -		1,020	2,605	4,234	6,409	6,981	6,653
Cumulative 5-yr (million \$2018)							
Public EV charging plugs - DC Fast (1000	0.07		2.03		9.05		14.7
units)							
Public EV charging plugs - L2 (1000 units)	0.285		48.9		217		352

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

Item	2020	2025	2030	2035	2040	2045	2050
Sales of space heating units - Electric	34.1	48.8	80.6	87.8	88.1	88	88
Heat Pump (%)							
Sales of space heating units - Electric	32.6	30.4	12.8	8.81	8.63	8.75	8.76
Resistance (%)							
Sales of space heating units - Gas (%)	27	14.4	4.38	2.16	2.08	2.05	2.05
Sales of space heating units - Fossil (%)	6.33	6.33	2.2	1.25	1.2	1.18	1.18
Sales of water heating units - Electric	0	12.1	64.3	75.9	76.4	76.4	76.4
Heat Pump (%)							
Sales of water heating units - Electric	72.5	72.8	30.8	21.4	21	21	21
Resistance (%)							
Sales of water heating units - Gas Furnace	23.5	12.5	2.34	0.099	0	0	0
(%)							
Sales of water heating units - Other (%)	3.93	2.64	2.61	2.62	2.63	2.63	2.64
Sales of cooking units - Electric	83.7	87.1	97.8	99.9	100	100	100
Resistance (%)							
Sales of cooking units - Gas (%)	16.3	12.9	2.2	0.111	0	0	0
Residential HVAC investment in 2020s vs.		3.86	4.57				
REF - Cumulative 5-yr (billion \$2018)							

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

	7-						
Item	2020	2025	2030	2035	2040	2045	2050
Sales of space heating units - Electric	11.7	29.4	77	90.8	91.9	92	92
Heat Pump (%)							
Sales of space heating units - Electric	5.83	4.63	4.92	6.27	6.62	6.6	6.56
Resistance (%)							
Sales of space heating units - Gas Furnace	82.5	63.1	17.5	2.95	1.48	1.44	1.44
(%)							
Sales of space heating units - Fossil (%)	0	2.9	0.562	0.024	0	0	0
Sales of water heating units - Electric	0.191	10.6	55.6	65.6	66.1	66.1	66.1
Heat Pump (%)							
Sales of water heating units - Electric	7.05	10.1	28.1	32.2	32.3	32.3	32.3
Resistance (%)							
Sales of water heating units - Gas Furnace	90.8	77.7	14.7	0.619	0	0	0
(%)							
Sales of water heating units - Other (%)	1.97	1.59	1.58	1.59	1.59	1.58	1.57
Sales of cooking units - Electric	43.5	55.3	83.4	88.9	89.2	89.2	89.1
Resistance (%)							
Sales of cooking units - Gas (%)	56.5	44.7	16.6	11.1	10.8	10.8	10.9
Commercial HVAC investment in 2020s -		13,557	15,391				
Cumulative 5-yr (million \$2018)							
		•					

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

		.,		-,			
Item	2020	2025	2030	2035	2040	2045	2050
Installed thermal - Coal (MW)	4,966	0	0	0	0	0	0
Installed thermal - Natural gas (MW)	12,572	21,918	21,742	21,044	14,535	14,965	20,267
Installed thermal - Nuclear (MW)	5,270	5,270	5,270	888	0	0	0

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

	In Electricit	y acricia	ing capacit				
Item	2020	2025	2030	2035	2040	2045	2050
Installed renewables - Rooftop PV (MW)	15.5	25	35.4	50.4	71.6	98.9	134
Installed renewables - Solar - Base land	335	2,122	6,743	23,201	46,907	83,108	141,243
use assumptions (MW)							
Installed renewables - Offshore Wind -	0	0	0	0	0	0	2,629
Base land use assumptions (MW)							
Installed renewables - Solar -	335	335	6,585	22,239	47,339	80,041	137,772
Constrained land use assumptions (MW)							
Installed renewables - Wind - Constrained	0	0	0	0	0	0	0
land use assumptions (MW)							
Installed renewables - Offshore Wind -	0	0	0	0	0	0	2,253
Constrained land use assumptions (MW)							
Capital invested - Solar PV - Base (billion		2.39	5.53	18.1	24.6	35.5	53.9
\$2018)							
Capital invested - Offshore Wind - Base		0	0	0	0	0	3.29
(billion \$2018)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Solar - Base land use assumptions (GWh)	762	4,206	13,083	44,797	90,138	159,581	271,134
Wind - Base land use assumptions (GWh)	0	0	0	0	0	0	0
OffshoreWind - Base land use assumptions (GWh)	0	0	0	0	0	0	7,836
Solar - Constrained land use assumptions (GWh)	1,525	1,525	25,563	85,807	181,940	307,228	528,729
Wind - Constrained land use assumptions (GWh)	0	0	0	0	0	0	0
OffshoreWind - Constrained land use assumptions (GWh)	0	0	0	0	0	0	13,386

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Low - Accelerate							-170
regeneration (1000 tCO2e/y)							
Carbon sink potential - Low - Avoid							-317
deforestation (1000 tCO2e/y)							
Carbon sink potential - Low - Extend							-4,448
rotation length (1000 tCO2e/y)							
Carbon sink potential - Low - Improve							-3,133
plantations (1000 tCO2e/y)							
Carbon sink potential - Low - Increase							-7,484
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - Low - Increase							-207
trees outside forests (1000 tCO2e/y)							
Carbon sink potential - Low - Reforest							-1,524
cropland (1000 tCO2e/y)							
Carbon sink potential - Low - Reforest							-531
pasture (1000 tCO2e/y)							
Carbon sink potential - Low - Restore							-1,873
productivity (1000 tCO2e/y)							
Carbon sink potential - Low - All (not							-19,687
counting overlap) (1000 tCO2e/y)							
Carbon sink potential - Mid - Accelerate							-255
regeneration (1000 tCO2e/y)							
Carbon sink potential - Mid - Avoid							-1,110
deforestation (1000 tCO2e/y)							
Carbon sink potential - Mid - Extend							-8,014
rotation length (1000 tCO2e/y)							

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

 Item
 2020
 2025
 20
 Item

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink notential - Mid - Improve							-4 591
nlantations $(1000 \pm 0.02 \text{ e/v})$							4,071
Conhon sink notantial Mid Inchaso							1/. 0/ 0
carboni sink potential - Miu - Increase							-14,900
Carbon sink potential - Mid - Increase							-400
trees outside forests (1000 tC02e/y)							
Carbon sink potential - Mid - Reforest							-2,286
cropland (1000 tCO2e/y)							
Carbon sink potential - Mid - Reforest							-3,768
pasture (1000 tCO2e/y)							
Carbon sink potential - Mid - Restore							-3.715
nroductivity (1000 tC02e/v)							-1
Carbon sink notential - Mid - All (not							-39107
counting overlap) (1000 \pm CO2e/y)							07,101
Counting over tap) (1000 (0026/y)							2/0
Carbon Sink potential - High - Accelerate							-340
regeneration (1000 tco2e/y)							1000
Carbon sink potential - High - Avoid							-1,902
deforestation (1000 tCO2e/y)							
Carbon sink potential - High - Extend							-11,580
rotation length (1000 tCO2e/y)							
Carbon sink potential - High - Improve							-6,158
plantations (1000 tC02e/v)							
Carbon sink notential - High - Increase							-22 452
retention of HWP (1000 \pm CO2e/y)							22,402
Corbon sink notantial High Increase							502
trace outside ferente (1000 t000e (v)							-372
Carbon sink potential - Hign - Reforest							-3,048
cropland (1000 tCO2e/y)							
Carbon sink potential - High - Reforest							-7,006
pasture (1000 tCO2e/y)							
Carbon sink potential - High - All (not							-58,635
counting overlap) (1000 tCO2e/y)							
Carbon sink potential - High - Restore							-5,558
productivity (1000 tCO2e/y)							-
Land impacted for carbon sink notential -							27.8
Low - Accelerate regeneration (1000							2110
hectares)							
Land impacted for earbor eight potential							0/0
Lanu impacted for carbon sink potential -							242
Low - Avoid deforestation (over 30 years)							
(IUUU nectares)							
Land impacted for carbon sink potential -							2,262
Low - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							1,134
Low - Improve plantations (1000							
hectares)							
Land impacted for carbon sink notential -							0
Low - Increase retention of HWP (1000							C C
hectares)							
Land impacted for earbor eink potential							20.4
Lanu impacteu for carbon sink potential -							29.0
Low - Increase trees outside forests							
(IUUU nectares)							
Land impacted for carbon sink potential -							101
Low - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							34.5
Low - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							1,115
Low - Restore productivity (1000							
hectares)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Land impacted for carbon sink notential -				2000	20.0		4 946
Low - Total impacted (over 30 years)							1,7 10
(1000 hectares)							
Land impacted for carbon sink notential -							/,17
Mid - Accelerate regeneration (1000							41.1
hostanos)							
Lond imposted for early notantial							050
Land impacted for carbon sink potential -							250
Mid - Avoid deforestation (over 30 years)							
Land impacted for carbon sink potential -							4,084
Mid - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							1,707
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 -							42.9
Mid - Increase trees outside forests (1000							
hectares							
Land impacted for carbon sink notential -							151
Mid - Reforest cronland (1000 hectares)							101
Land impacted for carbon sink notential -							2/.9
Mid Defenset posture (1000 bestance)							247
Land impacted for earbon sink notantial							0.0/.5
Mid Destane productivity (1000							2,245
Milu - Restore productivity (1000							
							0 770
Land impacted for carbon sink potential -							8,770
Mid - Total impacted (over 30 years) (1000							
hectaresj							
Land impacted for carbon sink potential -							55.6
High - Accelerate regeneration (1000							
hectares)							
Land impacted for carbon sink potential -							258
High - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							5,905
High - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							2.269
High - Improve plantations (1000							, -
hectares)							
Land impacted for carbon sink notential -							0
High - Increase retention of HWP (1000							0
hertares)							
Land impacted for carbon sink notential							56.3
Ligh Thomson those outside forests							50.5
(1000 hostopos)							
(1000 Hectares)							0.01
Lanu impacted for carbon Sink potential -							201
High - Reforest cropiana (1000 hectares)							
Land impacted for carbon sink potential -							199
High - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							1,842
High - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							10,786
High - Total impacted (over 30 years)							
(1000 hectares)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Moderate							-57.1
deployment - Corn-ethanol to energy							
grasses (1000 tCO2e/y)							
Carbon sink potential - Moderate							-1,171
deployment - Cropland measures (1000							
tCO2e/y)							
Carbon sink potential - Moderate							-29.1
deployment - Permanent conservation							
cover (1000 tC02e/y)							
Carbon sink potential - Moderate							-1,257
deployment - Total (1000 tCO2e/y)							
Carbon sink potential - Aggressive							-57.1
deployment - Corn-ethanol to energy							
grasses (1000 tC02e/y)							
Carbon sink potential - Aggressive							-2,225
deployment - Cropland measures (1000							
tCO2e/y)							
Carbon sink potential - Aggressive							-58.1
deployment - Permanent conservation							
cover (1000 tCO2e/y)							
Carbon sink potential - Aggressive							-2,340
deployment - Total (1000 tCO2e/y)							
Land impacted for carbon sink - Moderate							33
deployment - Corn-ethanol to energy							
grasses (1000 hectares)							
Land impacted for carbon sink - Moderate							528
deployment - Cropland measures (1000							
hectares)							
Land impacted for carbon sink - Moderate							52.8
deployment - Permanent conservation							
cover (1000 hectares)							
Land impacted for carbon sink - Moderate							614
deployment - Total (1000 hectares)							
Land impacted for carbon sink -							33
Aggressive deployment - Corn-ethanol to							
energy grasses (1000 hectares)							
Land impacted for carbon sink -							1,003
Aggressive deployment - Cropland							
measures (1000 hectares)							
Land impacted for carbon sink -							106
Aggressive deployment - Permanent							'
conservation cover (1000 hectares)							
Land impacted for carbon sink -							1,142
Aggressive deployment - Total (1000							
hectares)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Premature deaths from air pollution -		39.9	0.054	0.049	0.031	0.019	0.001
Fuel Comb - Electric Generation - Coal							
(deaths)							
Premature deaths from air pollution -		18.1	16.3	15	11.6	4.07	1.39
Fuel Comb - Electric Generation - Natural							
Gas (deaths)							
Premature deaths from air pollution -		111	103	77.4	44.4	20	7.7
Mobile - On-Road (deaths)							
Premature deaths from air pollution - Gas		9.74	8.88	6.63	3.89	1.86	0.853
Stations (deaths)							

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

Itom	2020	2025	2020	2025	207.0	20/.5	2050
Dependent of the free of collution	2020	2025	2030	2033	2040	2045	2030
Freihalure dealins from an ponution -		0.94	1.2	4.01	2.(1	1.39	0.722
(dootho)							
(dealins)		0.571	0 / 57	0.011	0.101	0.000	0.001
Premature deaths from air pollution -		0.571	0.457	0.311	0.181	0.083	0.031
Fuel Comb - Residential - Ull (deaths)			475	1.01			
Premature deaths from air pollution -		2	1.75	1.31	0.841	0.438	0.2
Fuel Comb - Residential - Other (deaths)							
Premature deaths from air pollution -		1.67	1.59	1.5	1.41	1.31	1.22
Fuel Comb - Comm/Institutional - Coal							
(deaths)							
Premature deaths from air pollution -		5.28	4.61	3.4	2.16	1.32	0.844
Fuel Comb - Comm/Institutional - Natural							
Gas (deaths)							
Premature deaths from air pollution -		0.963	0.796	0.62	0.45	0.307	0.195
Fuel Comb - Comm/Institutional - Oil							
(deaths)							
Premature deaths from air pollution -		0.566	0 473	0.384	0.298	0 217	0 142
Fuel Comb - Comm/Institutional - Other		0.000	0.410	0.004	0.270	0.211	0.142
(deaths)							
Dependent of the free of nellution		10.0	14.0	15	1/ 0	15.0	1/. 0
Industrial Dressesses - Ocal Mining		18.3	14.9	15	14.9	15.2	14.9
Industrial Processes - Coal Mining							
(deaths)							
Premature deaths from air pollution -		48	45.8	44.5	38	31.7	23.6
Industrial Processes - Oil & Gas							
Production (deaths)							
Monetary damages from air pollution -		354	0.481	0.436	0.278	0.172	0.012
Fuel Comb - Electric Generation - Coal							
(million \$2019)							
Monetary damages from air pollution -		160	144	133	103	36.1	12.4
Fuel Comb - Electric Generation - Natural							
Gas (million \$2019)							
Monetary damages from air pollution -		985	912	688	394	178	68.5
Mobile - On-Road (million \$2019)					_	_	
Monetary damages from air pollution -		86.3	78.6	587	34.4	16.5	7.56
Gas Stations (million \$2019)		00.0	10.0	00.1	0	1010	
Monetary damages from air pollution -		70.3	63.8	42.6	2/.	10.2	6 30
Fuel Comb. Desidential Natural Con		17.5	05.0	42.0	24	12.5	0.37
(million #0010)							
		F 0/	(05	0.75	1 (1	0.700	0.070
Monetary damages from air pollution -		5.06	4.05	2.75	1.61	0.733	0.273
Fuel Comb - Residential - Uil (million							
\$2019]							
Monetary damages from air pollution -		17.7	15.5	11.6	7.46	3.88	1.77
Fuel Comb - Residential - Other (million							
\$2019)							
Monetary damages from air pollution -		14.8	14.1	13.3	12.5	11.6	10.8
Fuel Comb - Comm/Institutional - Coal							
(million \$2019)							
Monetary damages from air pollution -		46.7	40.8	30.1	19.1	11.7	7.47
Fuel Comb - Comm/Institutional - Natural							
Gas (million \$2019)							
Monetary damages from air pollution -		8.53	7.05	5 49	398	2 7 2	173
Fuel Comh - Comm/Institutional - Oil		0.00	1.00	0+7	0.70	2.12	
(million \$2019)							
Monetary demages from air pollution		<u> </u>	/. 10	27.	9 4 /.	100	1 02
Fuel Comp. Comm/Institutional. Other		5.01	4.17	3.4	2.04	1.72	1.20
ruer comb - comm/mstitutional - other (million #0010)							
				100	100	405	404
Munetary damages from air pollution -		162	132	132	132	135	131
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 -		426	407	395	338	281	209
Industrial Processes - Oil & Gas							
Production (million \$2019)							

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

By economic sector - Agriculture (jobs) 237 340 1.081 1.552 1.638 1.176 By economic sector - Nanufacturing 3.785 3.562 3.972 4.139 4.280 4.146 [jobs] 252 355 875 1.089 11.328 11.289 12.388 1.094 4.186 By economic sector - Pipeline (jobs) 252 355 875 1.083 11.966 886 By economic sector - Professional (jobs) 3.512 3.240 4.343 3.750 3.751 3.753 3.753 3.753 3.753 3.753 3.753 3.753 3.753 3.751 5.016 6.415 4.888 By economic sector - Notissi (jobs) 3.761 3.750 </th <th>Item</th> <th>2020</th> <th>2025</th> <th>2030</th> <th>2035</th> <th>2040</th> <th>2045</th> <th>2050</th>	Item	2020	2025	2030	2035	2040	2045	2050
Eve conomic sector - Construction (jobs) 5,484 7,483 11,537 11,289 12,522 By economic sector - Mining (jobs) 3,765 3,562 3,972 4,139 4,280 4,146 By economic sector - Mining (jobs) 252 355 875 1,089 1,054 1,388 1,049 1,054 1,886 7,646 By economic sector - Price (jobs) 252 355 875 1,038 1,049 1,054 1,338 1,049 1,054 1,333 3,573 3,240 3,434 7,468 7,676 By economic sector - Trade (jobs) 7,21 4,284 6,870 5,086 6,097 3,34 By resource sector - Coal (jobs) 7,21 4,284 6,870 5,086 6,097 7,344 By resource sector - Oal (jobs) 7,295 10,067 15,732 15,462 17,482 19,643 By resource sector - Oal (jobs) 4,245 8,245 7,307 7,007 7,488 5,559 By resource sector - Nurice (jobs) 6,243 5,177	By economic sector - Agriculture (jobs)		237	340	1,081	1,552	1,638	1,176
Eye conomic sector - Manufacturing 3,785 3,562 3,972 4,139 4,280 4,146 By conomic sector - Other (lobs) 252 355 875 1083 1196 886 By conomic sector - Other (lobs) 252 355 875 1083 1196 886 By conomic sector - Professional (lobs) 2,725 2,513 3,240 3,436 3,750 3,751 3,751 3,751 3,750 3,751 3,750 3,751 3,750 3,751 3,750 3,500 6,415 4,888 By resource sector - Exector - E	By economic sector - Construction (jobs)		5,484	7,483	11,537	11,289	12,358	12,522
(jobs) - By conomic sector Chall (jobs) 3,512 3,370 5,411 1,414 - 4,413 1,713 1,53.45 1,732 1,54.20 1,735 1,73.45 1,732 1,54.21 1,735 1,73.40 1,735 1,73.40 1,735	By economic sector - Manufacturing		3,785	3,562	3,972	4,139	4,280	4,146
By economic sector - Mining (jobs) 5,176 3,990 3,176 2,291 1788 1,196 By economic sector - Pipeline (jobs) 687 1,092 1,388 1,049 1,054 1,185 By economic sector - Trade (jobs) 3,512 3,390 5,419 6,354 7,468 7,676 By economic sector - Unde (jobs) 2,725 2,513 3,240 3,448 3,570 3,573 By economic sector - Utilities (jobs) 9,635 11,715 15,308 14,413 19733 29,407 By resource sector - C02 (jobs) 7,21 4,284 6,870 5,586 6,099 7,394 By resource sector - C02 (jobs) 7,21 4,284 6,870 7,700 7,498 5,959 By resource sector - Nuclear (jobs) 2,640 2,617 2,011 4,914 1,916 1,276 By resource sector - Nuclear (jobs) 6,243 5,177 4,041 2,714 1,916 1,276 By resource sector - Sund (jobs) 6,627 7,163 9,217 14,466 36	(jobs)							
By economic sector - Other [jobs] 252 355 875 1.083 1.196 886 By economic sector - Professional (jobs) 3,512 3,390 5,419 6,354 7,468 7,676 By economic sector - Irrade (jobs) 2,725 2,813 3,240 3,446 3,750 3,474 3,750 3,743 3,750 3,240 3,446 3,750 3,676 By economic sector - Irrade (jobs) 9,2307 7,804 4,413 1973 29,307 By resource sector - Coal (jobs) 7,214 4,246 6,870 5,086 6,099 7,394 By resource sector - Coal (jobs) 9,295 10,067 15,732 15,462 17,852 19,643 1,035 1,234 By resource sector - Nuclear (jobs) 6,243 5,717 4,041 2,741 1,916 1,274 By resource sector - Nuclear (jobs) 5,04 3,84 275 4,46 362 2258 By education level - All sectors - High 13,094 14,500 19,672 19,583 22,439 <	By economic sector - Mining (jobs)		5,176	3,990	3,176	2,291	1,788	1,299
By economic sector - Pipeline (jobs) 687 1.092 1.338 1.094 1.054 1.135 By economic sector - Trade (jobs) 3.512 3.390 5.419 6.354 7.468 7.676 By economic sector - Trade (jobs) 9.635 11,715 15.308 11,413 19,733 29,307 By resource sector - C02 (jobs) 7.21 4,284 6.870 5.861 6.415 4,888 By resource sector - C02 (jobs) 7.21 4,284 6.870 5.866 6.099 7.394 By resource sector - Nuclear (jobs) 9.295 10.067 15.732 15.462 17.852 19,643 By resource sector - Nuclear (jobs) 6.243 5.177 4.041 2.741 1916 1.274 By resource sector - Nuclear (jobs) 6.243 5.177 4.041 2.741 1916 1.274 By resource sector - Nuclear (jobs) 6.243 5.177 4.041 2.741 1916 1.274 By resource sector - Nuclear (jobs) 6.243 5.177 4.042 3.654	By economic sector - Other (jobs)		252	355	875	1,083	1,196	886
By economic sector - Professional (jobs) 3,512 3,390 5,419 6,354 7,468 7,476 By economic sector - Utilities (jobs) 2,725 2,513 3,240 3,436 3,750 3,573 By economic sector - Utilities (jobs) 831 871 3,707 5,801 6,415 4,888 By resource sector - Coal (jobs) 7,21 4,284 6,870 5,086 6,099 7,394 By resource sector - Natural Gas (jobs) 3,066 1,714 1,496 1,309 1,185 1,035 By resource sector - Natural Gas (jobs) 8,425 8,245 7,307 7,708 5,996 By resource sector - Natural Gas (jobs) 6,243 5,177 4,041 2,741 1,916 1,274 By resource sector - Natural Gas (jobs) 463 1,082 3,943 4,981 4,993 2,635 By education level - All sectors - High 13,094 14,500 19,672 19,583 22,439 25,148 By education level - All sectors - Masters 9,627 10,822 14,475	By economic sector - Pipeline (jobs)		687	1,092	1,338	1,049	1,054	1,133
By economic sector - Trade [jobs] 2,725 2,513 3,240 3,436 3,750 3,570 By economic sector - Utilities [jobs] 9,635 11,715 15,308 14,413 19,733 29,307 By resource sector - C02 [jobs] 7,21 4,284 6,870 5,006 6,4415 4,888 By resource sector - C02 [jobs] 7,21 4,284 6,870 15,462 17,852 19,963 By resource sector - Nuclear [jobs] 8,425 8,245 7,307 7700 7498 5,959 By resource sector - Nuclear [jobs] 6,243 5,177 4,041 2,741 1,916 1,274 By resource sector - Nuclear [jobs] 6,243 5,177 4,041 2,741 1,916 1,274 By resource sector - Nind [jobs] 504 384 275 4,46 362 2518 By education level - All sectors - High 13,094 14,500 19,672 19,583 22,439 25,148 School diploma or less [jobs] 9,627 10,822 14,475 14,243 <	By economic sector - Professional (jobs)		3,512	3,390	5,419	6,354	7,468	7,676
Eyr economic sector - Utilities (jobs) 9635 11,715 15,308 14,413 19,733 29,307 By resource sector - Coll (jobs) 831 871 3,707 5,801 6,415 4,888 By resource sector - Coll (jobs) 7,21 4,284 6,870 5,086 6,099 7,394 By resource sector - Coll (jobs) 9,295 10,67 15,732 15,462 17,852 19,963 By resource sector - Natural Cas (jobs) 8,425 8,245 7,307 7,700 7,498 5,999 By resource sector - Nuclear (jobs) 2,660 2,618 2,576 2,081 6,944 18,315 By resource sector - Nuclear (jobs) 4,63 1,082 3,943 4,981 4,993 2,235 By resource sector - Nuclear (jobs) 9,627 10,822 14,475 14,243 16,614 18,963 By education level - All sectors - Masters 9,627 10,822 14,475 14,243 16,614 18,963 By education level - All sectors - Masters 6,872 7,163 9,219 <td>By economic sector - Trade (jobs)</td> <td></td> <td>2,725</td> <td>2,513</td> <td>3,240</td> <td>3,436</td> <td>3,750</td> <td>3,573</td>	By economic sector - Trade (jobs)		2,725	2,513	3,240	3,436	3,750	3,573
Eyr esource sector - Biomass [ibbs] 831 871 3,707 5,801 6,415 4,888 By resource sector - Co2 (ibbs) 7,21 4,284 6,870 5,086 6,099 7,394 By resource sector - Co2 (ibbs) 9,275 10,067 15,732 15,462 17,852 19,963 By resource sector - Nuclear (ibbs) 8,425 8,275 3,007 7,700 7,498 5,959 By resource sector - Nuclear (ibbs) 6,243 5,177 4,041 2,2741 19,161 1,274 By resource sector - Wind (ibbs) 6,243 1,082 3,943 4,981 4,993 2,635 By resource sector - Wind (ibbs) 504 384 275 4,46 362 25148 School diploma or less (jobs) 9,627 10,822 14,475 14,243 16,541 18,963 Associates degree or some college (jobs) 9,627 10,822 14,475 14,243 16,541 18,963 By education level - All sectors - Maghter 6,872 7,163 9,219 9,157	By economic sector - Utilities (jobs)		9,635	11,715	15,308	14,413	19,733	29,307
Figures Figures 721 4,284 6,870 5,086 6,099 7,394 By resource sector - Coal (jobs) 3,066 1,714 1,496 1,309 1,185 1,035 By resource sector - Natural Gas (jobs) 8,425 8,245 7,307 7,700 7,498 5,559 By resource sector - Natural Gas (jobs) 2,660 2,618 2,576 2,081 6,944 18,315 By resource sector - Notal (jobs) 6,243 5,177 4,041 2,741 1916 1,274 By resource sector - Solar (jobs) 504 3,84 2,757 4,444 3,622 258 By ducation level - All sectors - High 13,094 14,500 19,672 19,583 22,439 25,148 School diploma or less (jobs) 9,627 10,822 14,475 14,243 16,541 18,963 Associates degree or some college (jobs) 9,219 9,157 11,066 13,625 By education level - All sectors - Masters 1,675 1,731 2,275 2,811 3,466	By resource sector - Biomass (jobs)		831	871	3,707	5,801	6,415	4,888
By resource sector - Coal [jobs] 3.066 1.714 1.496 1.309 1.185 1.035 By resource sector - Nuclear [jobs] 9.295 10.067 15.732 17.852 19.963 By resource sector - Nuclear [jobs] 2.660 2.618 2.257 2.081 6.944 18.315 By resource sector - Nuclear [jobs] 6.243 5.177 4.041 2.741 1916 1.274 By resource sector - Wind [jobs] 504 3.84 275 4.46 3.62 258 By education level - All sectors - High 13.094 14.500 19.583 22.439 25.148 School diploma or less (jobs) - 9.627 10.822 14.475 14.243 16.541 18.963 Associates degree on some college (jobs) - - 6.872 7.163 9.219 9.157 11.066 13.625 By education level - All sectors - Masters 1.675 1.731 2.273 2.295 2.811 3.486 or professional degree (jobs) - 1.675 1.731 <td< td=""><td>By resource sector - CO2 (jobs)</td><td></td><td>7.21</td><td>4,284</td><td>6,870</td><td>5,086</td><td>6,099</td><td>7,394</td></td<>	By resource sector - CO2 (jobs)		7.21	4,284	6,870	5,086	6,099	7,394
By resource sector - Natural Gas (jobs) 9.295 10.067 15.732 15.462 17.852 19.963 By resource sector - Natural Gas (jobs) 8.425 8.245 7.307 7.700 7.498 5.959 By resource sector - Nuclear (jobs) 2.660 2.618 2.576 2.081 6.944 18.315 By resource sector - Oil (jobs) 6.423 5.177 4.041 2.741 1.916 1.274 By resource sector - Wind (jobs) 504 384 275 4.46 362 258 By ducation level - All sectors - High 13.074 14.500 19.672 19.583 22.439 25.148 school diploma or less (jobs) - - 9.627 10.822 14.475 14.243 16.541 18.963 Associates degree or some college (jobs) - - - 17.31 2.273 2.295 2.811 3.486 By education level - All sectors - Masters 1.675 1.731 2.275 2.811 3.486 By education level - All sectors - Doctoral 227 <td>By resource sector - Coal (jobs)</td> <td></td> <td>3,066</td> <td>1,714</td> <td>1,496</td> <td>1,309</td> <td>1,185</td> <td>1,035</td>	By resource sector - Coal (jobs)		3,066	1,714	1,496	1,309	1,185	1,035
By resource sector - Natural Gas (jobs) 8,425 8,245 7,307 7,700 7,498 5,959 By resource sector - Nuclear (jobs) 2,660 2,618 2,576 2,081 6,944 18,315 By resource sector - Solar (jobs) 6,243 5,177 4,041 2,741 19/6 1,274 By resource sector - Solar (jobs) 504 384 275 4,46 362 258 By education level - All sectors - High 13,094 14,500 19,672 19,583 22,439 25,148 By education level - All sectors - me college (jobs) 9,627 10.822 14,475 14,243 16,541 18,963 By education level - All sectors - Masters 6,872 7,163 9,219 9,157 11,066 13,625 By education level - All sectors - Nasters 1,675 1,731 2,273 2,295 2,811 3,486 or professional degree (jobs) 19,6457 4,982 6,746 6,722 7,777 8,808 None (jobs) 11,621 12,599 16,647 <td< td=""><td>By resource sector - Grid (jobs)</td><td></td><td>9,295</td><td>10,067</td><td>15,732</td><td>15,462</td><td>17,852</td><td>19,963</td></td<>	By resource sector - Grid (jobs)		9,295	10,067	15,732	15,462	17,852	19,963
By resource sector - Nuclear (jobs) 2,660 2,618 2,576 2,081 6,944 18,315 By resource sector - Oll (jobs) 6,243 5,177 4,041 2,741 1,916 1,274 By resource sector - Oll (jobs) 4,63 1,082 3,943 4,991 4,993 2,635 By resource sector - Wind (jobs) 504 3.84 275 4.46 3.62 258 By education level - All sectors - High 13,094 14,500 19,672 19,583 22,439 25,148 School diploma or less (jobs) 9,627 10,822 14,475 14,243 16,541 18,963 By education level - All sectors - Masters 6,872 7,163 9,219 9,157 11,066 13,625 By education level - All sectors - Doctoral 227 224 308 328 406 497 degree (jobs) 11,675 1,731 2,275 2,811 3,486 Professional degree (jobs) 277 24 308 328 406 497	By resource sector - Natural Gas (jobs)		8,425	8,245	7,307	7,700	7,498	5,959
By resource sector - 0il (jobs) 6.243 5.177 4.041 2.741 1.916 1.274 By resource sector - Solar (jobs) 463 1,082 3.943 4.981 4.993 2.635 By education level - All sectors - High school diploma or less (jobs) 13,094 14,500 19,672 19,583 22,439 25,148 By education level - All sectors - Migh school diploma or less (jobs) 9,627 10,822 14,475 14,243 16,541 18,963 Associates degree or some college (jobs) 6,872 7,163 9,219 9,157 11,066 13,625 By education level - All sectors - Masters or professional degree (jobs) 6,872 7,163 9,219 9,157 11,066 13,625 By education level - All sectors - Soctoral degree (jobs) 227 224 308 328 406 497 Related work experience - All sectors - Up (jobs) 6,055 6,590 9,041 9,149 10,609 12,014 to 4 years (jobs) 1 1 12,599 16,647 16,457 19,239 22,411	By resource sector - Nuclear (jobs)		2,660	2,618	2,576	2,081	6,944	18,315
By resource sector - Solar (jobs) 463 1,082 3,943 4,981 4,993 2,635 By resource sector - Wind (jobs) 504 384 275 444 362 258 By resource sector - Wind (jobs) 13,094 14,500 19,672 19,583 22,439 25,148 School diploma or less (jobs) 9,627 10,822 14,475 14,243 16,541 18,963 Associates degree or some college (jobs) 9,627 10,822 14,475 14,243 16,541 18,963 By education level - All sectors - Masters 6,872 7,163 9,219 9,157 11,066 13,625 By education level - All sectors - Masters 1,675 1,731 2,273 2,295 2,811 3,486 Or professional degree (jobs) 8 406 497 4982 6,746 6,722 7,777 8,808 None (jobs) - 4,457 4,982 6,746 6,722 7,777 8,808 Related work experience - All sectors - 1 11,621 12,599	By resource sector - Oil (iobs)		6,243	5,177	4,041	2,741	1.916	1,274
By resource sector - Wind [jobs] 504 384 275 446 362 258 By education level - All sectors - High school diploma or less [jobs] 13,094 14,500 19,672 19,583 22,439 25,148 By education level - All sectors - Associates degree or some college (jobs) 9,627 10,822 14,475 14,243 16,541 18,963 By education level - All sectors - Bachelors degree (jobs) 6,872 7,163 9,219 9,157 11,066 13,625 By education level - All sectors - Bachelors degree (jobs) 1,675 1,731 2,273 2,295 2,811 3,486 By education level - All sectors - Doctoral degree (jobs) 227 224 308 328 406 497 Related work experience - All sectors - Up to 1 year (jobs) 6,055 6,590 9,041 9,149 10,609 12,014 A vears (jobs) 11,621 12,599 16,647 16,457 19,239 22,411 Kelated work experience - All sectors - 1 11,621 12,599 16,647 16,457 19,239 2,411	By resource sector - Solar (jobs)		463	1,082	3,943	4,981	4,993	2,635
By education level - All sectors - High school diploma or less (jobs) 13,094 14,500 19,672 19,583 22,439 25,148 By education level - All sectors - By education level - All sectors - Bachelors degree (jobs) 9,627 10,822 14,475 14,243 16,541 18,963 By education level - All sectors - Bachelors degree (jobs) 6,872 7,163 9,219 9,157 11,066 13,625 By education level - All sectors - Masters or professional degree (jobs) 6,872 7,163 9,219 9,157 11,066 13,625 By education level - All sectors - Doctoral degree (jobs) 6,872 7,163 9,219 9,157 11,066 13,625 By education level - All sectors - Doctoral degree (jobs) 227 224 308 328 406 497 Related work experience - All sectors - None (jobs) 11,621 12,599 16,647 16,457 19,239 22,411 to 1 years (jobs) 10,699 12,014 10,543 12,380 14,533 Related work experience - All sectors - None (jobs) 1,675 1,791 2,393 2,299	By resource sector - Wind (jobs)		504	384	275	446	362	258
school diploma or less (jobs) 9,627 10,822 14,475 14,243 16,541 18,963 By education level - All sectors - Associates degree or some college (jobs) 6,872 7,163 9,219 9,157 11,066 13,625 By education level - All sectors - Bachelors degree (jobs) 6,872 7,163 9,219 9,157 11,066 13,625 By education level - All sectors - Masters or professional degree (jobs) 1,675 1,731 2,273 2,295 2,811 3,486 By education level - All sectors - Doctoral degree (jobs) 227 224 308 328 406 497 Related work experience - All sectors - User (jobs) 6,055 6,590 9,041 9,149 10,609 12,014 to 1 year (jobs) 11,621 12,599 16,647 16,457 19,239 22,411 to 4 years (jobs) 10 years (jobs) 11,621 12,599 16,647 16,457 19,239 2,411 to 4 years (jobs) 10 years (jobs) 11,621 12,599 16,647 16,457 19,238 3,258	By education level - All sectors - High		13,094	14,500	19,672	19,583	22,439	25,148
By education level - All sectors - Associates degree or some college (jobs) 9,627 10,822 14,475 14,243 16,541 18,963 Associates degree or some college (jobs) 6,872 7,163 9,219 9,157 11,066 13,625 Bachelors degree (jobs) 6,872 7,163 9,219 9,157 11,066 13,625 By education level - All sectors - Masters 1,675 1,731 2,273 2,295 2,811 3,486 or professional degree (jobs) 1 227 224 308 328 406 497 Related work experience - All sectors - Doctoral 227 224 308 328 406 497 Related work experience - All sectors - Up 6,055 6,590 9,041 9,149 10,609 12,014 to 1 vear (jobs) 11,621 12,599 16,647 16,457 19,239 22,411 to 4 vears (jobs) 7,363 8,113 10,719 10,543 12,380 14,533 Related work experience - All sectors - 4 7,363 8,113	school diploma or less (jobs)							
Associates degree or some college (jobs) Associates degree (jobs) Associates degree (jobs) By education level - All sectors - Masters or professional degree (jobs) 11,066 13,625 By education level - All sectors - Masters or professional degree (jobs) 1,675 1,731 2,273 2,295 2,811 3,486 By education level - All sectors - Doctoral degree (jobs) 227 224 308 328 406 497 Related work experience - All sectors - Doctoral to 19 (jobs) 227 224 308 328 406 497 Related work experience - All sectors - Up to 1 year (jobs) 6,055 6,590 9,041 9,149 10,609 12,014 To 4 years (jobs) 11,621 12,599 16,647 16,457 19,239 22,411 to 4 years (jobs) 10 years (jobs) 10,543 12,380 14,533 Related work experience - All sectors - 4 7,363 8,113 10,719 10,543 12,380 14,533 to 10 years (jobs) 1,675 1,791 2,393 2,399 2,862 3,423 (jobs) </td <td>By education level - All sectors -</td> <td></td> <td>9,627</td> <td>10,822</td> <td>14,475</td> <td>14,243</td> <td>16,541</td> <td>18,963</td>	By education level - All sectors -		9,627	10,822	14,475	14,243	16,541	18,963
By education level - All sectors - Masters 6,872 7,163 9,219 9,157 11,066 13,625 Bachelors degree (jobs) Isectors - Masters 1,675 1,731 2,273 2,295 2,811 3,486 or professional degree (jobs) Isectors - Doctoral degree (jobs) 227 224 308 328 406 497 degree (jobs) Related work experience - All sectors - Doctoral degree (jobs) 227 224 308 328 406 497 Related work experience - All sectors - Up to 1 vear (jobs) 6,055 6,590 9,041 9,149 10,609 12,014 to 1 vear (jobs) Related work experience - All sectors - 1 11,621 12,599 16,647 16,457 19,239 22,411 to 4 vears (jobs) Related work experience - All sectors - 4 7,363 8,113 10,719 10,543 12,380 14,533 to 10 years (jobs) 0n-the-Job Training - All sectors - None 1,675 1,791 2,393 2,399 2,862 3,423 (jobs) 0n-the-Job Training - All sectors - 1 to 4	Associates degree or some college (jobs)				-			-
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By education level - All sectors - Masters or professional degree (jobs) 1,675 1,731 2,273 2,295 2,811 3,486 By education level - All sectors - Doctoral degree (jobs) 227 224 308 328 406 497 Related work experience - All sectors - None (jobs) A,457 4,982 6,746 6,722 7,777 8,808 Related work experience - All sectors - Up to 1 year (jobs) 6,055 6,590 9,041 9,149 10,609 12,014 Related work experience - All sectors - 1 11,621 12,599 16,647 16,457 19,239 22,411 Related work experience - All sectors - 1 11,621 12,599 16,647 16,457 19,239 22,411 Related work experience - All sectors - 1 11,621 12,599 16,647 16,457 19,239 22,411 Related work experience - All sectors - 1 19,99 2,157 2,794 2,735 3,258 3,953 On-the-Job Training - All sectors - None (jobs) 1,675 1,791 2,393 2,399 2,862 3,423	Bachelors degree (jobs)				-	-		
or professional degree (jobs) u <thu> u u <thu< td=""><td>By education level - All sectors - Masters</td><td></td><td>1,675</td><td>1,731</td><td>2,273</td><td>2,295</td><td>2,811</td><td>3,486</td></thu<></thu>	By education level - All sectors - Masters		1,675	1,731	2,273	2,295	2,811	3,486
By education level - All sectors - Doctoral degree (jobs) 227 224 308 328 406 497 Related work experience - All sectors - None (jobs) 4,457 4,982 6,746 6,722 7,777 8,808 Related work experience - All sectors - Up to 1 year (jobs) 6,055 6,590 9,041 9,149 10,609 12,014 Related work experience - All sectors - 1 11,621 12,599 16,647 16,457 19,239 22,411 Related work experience - All sectors - 4 7,363 8,113 10,719 10,543 12,380 14,533 to 10 years (jobs) 0 2157 2,794 2,735 3,258 3,953 Over 10 years (jobs) 0 1,675 1,791 2,393 2,399 2,862 3,423 (jobs) 0 1,675 1,791 2,393 2,399 2,862 3,423 (jobs) 0 1,675 1,791 2,393 3,025 35,094 40,657 Year (jobs) 0 1,675 1,791 2	or professional degree (jobs)							
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Related work experience - All sectors - None (jobs) 4,457 4,982 6,746 6,722 7,777 8,808 Related work experience - All sectors - Up to 1 year (jobs) 6,055 6,590 9,041 9,149 10,609 12,014 Related work experience - All sectors - 1 to 4 years (jobs) 11,621 12,599 16,647 16,457 19,239 22,411 Related work experience - All sectors - 4 to 10 years (jobs) 7,363 8,113 10,719 10,543 12,380 14,533 Related work experience - All sectors - Over 10 years (jobs) 1999 2,157 2,794 2,735 3,258 3,953 On-the-Job Training - All sectors - None (jobs) 1,675 1,791 2,393 2,399 2,862 3,423 On-the-Job Training - All sectors - Up to 1 year (jobs) 20,991 22,567 30,038 30,025 35,094 40,657 On-the-Job Training - All sectors - 0 tor 10 years (jobs) 1,981 2,360 3,247 3,164 3,634 4,070 On-the-Job Training - All sectors - 0 ver 10 years (jobs) 282 314 414 404 <td< td=""><td>degree (jobs)</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>	degree (jobs)							
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Related work experience - All sectors - Up to 1 year (jobs) 6,055 6,590 9,041 9,149 10,609 12,014 Related work experience - All sectors - 1 to 4 years (jobs) 11,621 12,599 16,647 16,457 19,239 22,411 Related work experience - All sectors - 4 to 10 years (jobs) 7,363 8,113 10,719 10,543 12,380 14,533 Related work experience - All sectors - 4 to 10 years (jobs) 7,363 8,113 10,719 10,543 12,380 14,533 On-the-Job Training - All sectors - None (jobs) 1,675 1,791 2,393 2,399 2,862 3,423 On-the-Job Training - All sectors - Up to 1 20,991 22,567 30,038 30,025 35,094 40,657 vear (jobs) 0n-the-Job Training - All sectors - 1 to 4 6,567 7,409 9,856 9,613 11,197 12,999 vear (jobs) 0n-the-Job Training - All sectors - 0 ver 10 282 314 414 404 476 570 On-the-Job Training - All sectors - 0 ver 10 282 314 414 404	None (jobs)							
to 1 year (jobs) Image: Constraint of the sectors of the	Related work experience - All sectors - Up		6,055	6,590	9,041	9,149	10,609	12,014
Related work experience - All sectors - 1 to 4 years (jobs) 11,621 12,599 16,647 16,457 19,239 22,411 Related work experience - All sectors - 4 to 10 years (jobs) 7,363 8,113 10,719 10,543 12,380 14,533 Related work experience - All sectors - Over 10 years (jobs) 19,999 2,157 2,794 2,735 3,258 3,953 Over 10 years (jobs) 10,647 16,457 19,239 24,11 On-the-Job Training - All sectors - None (jobs) 1,675 1,791 2,393 2,399 2,862 3,423 On-the-Job Training - All sectors - Up to 1 years (jobs) 20,991 22,567 30,038 30,025 35,094 40,657 On-the-Job Training - All sectors - 1 to 4 years (jobs) 6,567 7,409 9,856 9,613 11,197 12,999 On-the-Job Training - All sectors - 4 to 10 years (jobs) 1,981 2,360 3,247 3,164 3,634 4,070 On-the-Job Training - All sectors - 0 ver 10 years (jobs) 282 314 414 404 476 570 On-Site or In-Plant Training - All sectors - None (jobs) 19,113 20,589 27,357	_to 1 year (jobs)							
to 4 years (jobs) Related work experience - All sectors - 4 7,363 8,113 10,719 10,543 12,380 14,533 Related work experience - All sectors - 0ver 10 years (jobs) 1,999 2,157 2,794 2,735 3,258 3,953 Over 10 years (jobs) 0n-the-Job Training - All sectors - None 1,675 1,791 2,393 2,399 2,862 3,423 On-the-Job Training - All sectors - Up to 1 20,991 22,567 30,038 30,025 35,094 40,657 year (jobs) 0n-the-Job Training - All sectors - 1 to 4 6,567 7,409 9,856 9,613 11,197 12,999 years (jobs) 0n-the-Job Training - All sectors - 4 to 10 1,981 2,360 3,247 3,164 3,634 4,070 years (jobs) 0n-the-Job Training - All sectors - 0ver 10 282 314 414 404 476 570 years (jobs) 0n-Site or In-Plant Training - All sectors - None (jobs) 19,113 20,589 27,357 27,263 31,863 36,966	Related work experience - All sectors - 1		11,621	12,599	16,647	16,457	19,239	22,411
Related work experience - All sectors - 4 to 10 years (jobs) 7,363 8,113 10,719 10,543 12,380 14,533 Related work experience - All sectors - Over 10 years (jobs) 1,999 2,157 2,794 2,735 3,258 3,953 On-the-Job Training - All sectors - None (jobs) 1,675 1,791 2,393 2,399 2,862 3,423 On-the-Job Training - All sectors - Up to 1 year (jobs) 20,991 22,567 30,038 30,025 35,094 40,657 On-the-Job Training - All sectors - 1 to 4 years (jobs) 6,567 7,409 9,856 9,613 11,197 12,999 On-the-Job Training - All sectors - 4 to 10 years (jobs) 1,981 2,360 3,247 3,164 3,634 4,070 On-the-Job Training - All sectors - 0ver 10 years (jobs) 282 314 414 404 476 570 On-the-Job Training - All sectors - years (jobs) 0 282 314 414 404 476 570 On-Site or In-Plant Training - All sectors - None (jobs) 19,113 20,589 27,357 27,263 31,863 36,966 Up to 1 year (jobs) 0n-Site or In-Plant Trainin	to 4 years (jobs)							
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Related work experience - All sectors - Over 10 years (jobs) 1,999 2,157 2,794 2,735 3,258 3,953 On-the-Job Training - All sectors - None 1,675 1,791 2,393 2,399 2,862 3,423 (jobs) 0n-the-Job Training - All sectors - Up to 1 20,991 22,567 30,038 30,025 35,094 40,657 year (jobs) 0n-the-Job Training - All sectors - 1 to 4 6,567 7,409 9,856 9,613 11,197 12,999 years (jobs) 0n-the-Job Training - All sectors - 4 to 10 1,981 2,360 3,247 3,164 3,634 4,070 years (jobs) 0n-the-Job Training - All sectors - 0ver 10 282 314 414 404 476 570 on-site or In-Plant Training - All sectors - 0ver 10 282 314 414 404 476 570 On-Site or In-Plant Training - All sectors - 0ver 10 282 314 7,267 7,281 8,582 10,048 On-Site or In-Plant Training - All sectors - 0ver 10 20,589 27,357 27,263 31,863 36,966 Up to 1 year (jobs) 0n-Site or In-Plant Training - All	to 10 years (jobs)							
Over 10 years (jobs) Image: Constraining of the sectors	Related work experience - All sectors -		1,999	2,157	2,794	2,735	3,258	3,953
On-the-Job Training - All sectors - None (jobs) 1,675 1,791 2,393 2,399 2,862 3,423 On-the-Job Training - All sectors - Up to 1 year (jobs) 20,991 22,567 30,038 30,025 35,094 40,657 On-the-Job Training - All sectors - 1 to 4 years (jobs) 6,567 7,409 9,856 9,613 11,197 12,999 On-the-Job Training - All sectors - 4 to 10 years (jobs) 1,981 2,360 3,247 3,164 3,634 4,070 On-the-Job Training - All sectors - 0ver 10 years (jobs) 282 314 414 404 476 570 On-Site or In-Plant Training - All sectors - None (jobs) 0n-Site or In-Plant Training - All sectors - None (jobs) 19,113 20,589 27,357 27,263 31,863 36,966	Over 10 years (Jobs)							
Ljobs Con-the-Job Training - All sectors - Up to 1 20,991 22,567 30,038 30,025 35,094 40,657 year (jobs) On-the-Job Training - All sectors - 1 to 4 6,567 7,409 9,856 9,613 11,197 12,999 years (jobs) On-the-Job Training - All sectors - 4 to 10 1,981 2,360 3,247 3,164 3,634 4,070 years (jobs) On-the-Job Training - All sectors - 0ver 10 282 314 414 404 476 570 on-Site or In-Plant Training - All sectors - 4,957 5,404 7,267 7,281 8,582 10,048 On-Site or In-Plant Training - All sectors - 19,113 20,589 27,357 27,263 31,863 36,966 Up to 1 year (jobs) Up to 1 year (jobs) 19,113 20,589 27,357 27,263 31,863 36,966	On-the-Job Training - All sectors - None		1,675	1,791	2,393	2,399	2,862	3,423
Un-the-Job Training - All sectors - Up to 1 20,991 22,567 30,038 30,025 35,094 40,657 year (jobs) 0n-the-Job Training - All sectors - 1 to 4 6,567 7,409 9,856 9,613 11,197 12,999 years (jobs) 0n-the-Job Training - All sectors - 4 to 10 1,981 2,360 3,247 3,164 3,634 4,070 On-the-Job Training - All sectors - 0ver 10 282 314 414 404 476 570 vears (jobs) 0n-Site or In-Plant Training - All sectors - 0ver 10 282 314 7,267 7,281 8,582 10,048 None (jobs) 0n-Site or In-Plant Training - All sectors - 19,113 20,589 27,357 27,263 31,863 36,966			00.001				05.00/	
Vear (jobs) Vear (jobs) <	Un-the-Job Training - All sectors - Up to I		20,991	22,567	30,038	30,025	35,094	40,657
Un-the-Job Training - All sectors - 1 to 4 6,567 7,409 9,856 9,613 11,197 12,999 years (jobs) 0n-the-Job Training - All sectors - 4 to 10 1,981 2,360 3,247 3,164 3,634 4,070 years (jobs) 0n-the-Job Training - All sectors - Over 10 282 314 414 404 476 570 years (jobs) 0n-Site or In-Plant Training - All sectors - 4,957 5,404 7,267 7,281 8,582 10,048 None (jobs) 0n-Site or In-Plant Training - All sectors - 19,113 20,589 27,357 27,263 31,863 36,966	year (jobs)			7/00	0.05/	0 (10	11 107	10.000
Vears (jobs) Image: Constraining - All sectors - 4 to 10 1,981 2,360 3,247 3,164 3,634 4,070 Vears (jobs) 0n-the-Job Training - All sectors - Over 10 282 314 414 404 476 570 Vears (jobs) 0n-Site or In-Plant Training - All sectors - 4,957 5,404 7,267 7,281 8,582 10,048 None (jobs) 0n-Site or In-Plant Training - All sectors - 19,113 20,589 27,357 27,263 31,863 36,966	Un-the-Job Training - All sectors - 1 to 4		6,567	7,409	9,856	9,613	11,197	12,999
On-the-Job Training - All sectors - 4 to 10 1,961 2,360 3,247 3,164 3,634 4,070 years (jobs) On-the-Job Training - All sectors - Over 10 282 314 414 404 476 570 years (jobs) On-Site or In-Plant Training - All sectors - None (jobs) 4,957 5,404 7,267 7,281 8,582 10,048 On-Site or In-Plant Training - All sectors - None (jobs) 19,113 20,589 27,357 27,263 31,863 36,966	On the Joh Training All costons (to 10		1.001	0.0/0	2.047	0.177	2 (2 ((070
years (jobs) 282 314 414 404 476 570 On-the-Job Training - All sectors - Over 10 years (jobs) 282 314 414 404 476 570 On-Site or In-Plant Training - All sectors - None (jobs) 4,957 5,404 7,267 7,281 8,582 10,048 On-Site or In-Plant Training - All sectors - Up to 1 year (jobs) 19,113 20,589 27,357 27,263 31,863 36,966	verse (jobs)		1,701	2,300	3,241	3,104	3,034	4,070
Vears (jobs) 282 314 414 404 478 378 On-Site or In-Plant Training - All sectors - None (jobs) 4,957 5,404 7,267 7,281 8,582 10,048 On-Site or In-Plant Training - All sectors - None (jobs) 19,113 20,589 27,357 27,263 31,863 36,966	On the Joh Training All sectors Over 10		202	21/.	/.1/.	/.0/.	1.76	570
On-Site or In-Plant Training - All sectors - None (jobs) 4,957 5,404 7,267 7,281 8,582 10,048 On-Site or In-Plant Training - All sectors - Up to 1 year (jobs) 19,113 20,589 27,357 27,263 31,863 36,966	vers (interiors)		202	314	414	404	410	510
None (jobs) 4,731 3,404 1,201 1,201 8,582 10,048 On-Site or In-Plant Training - All sectors - Up to 1 year (jobs) 19,113 20,589 27,357 27,263 31,863 36,966	On-Site or In-Plant Training - All sectors -		657	5 /.0/.	7967	7 2 21	8 5 8 2	10 0/.2
On-Site or In-Plant Training - All sectors - Up to 1 year (jobs) 19,113 20,589 27,357 27,263 31,863 36,966	None (iobs)		-+,/J1	0,404	1,201	1,201	0,002	10,040
Up to 1 year (jobs)	On-Site or In-Plant Training - All sectors -		19,113	20.589	27.357	27.263	31.863	36.966
	Up to 1 year (jobs)		.,	- /	,	,===	- ,	

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

Item	2020	2025	2030	2035	2040	2045	2050
On-Site or In-Plant Training - All sectors -		5,102	5,722	7,615	7,445	8,651	9,998
1 to 4 years (jobs)							
On-Site or In-Plant Training - All sectors -		2,072	2,431	3,303	3,217	3,711	4,207
4 to 10 years (jobs)							
On-Site or In-Plant Training - All sectors -		250	295	405	400	456	500
Over 10 years (jobs)							
Wage income - All (million \$2019)		1,690	1,858	2,473	2,470	2,972	3,623

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

Item	2020	2025	2030	2035	2040	2045	2050
Final energy use - Transportation (PJ)	546	508	443	365	294	250	232
Final energy use - Residential (PJ)	163	153	141	126	114	108	105
Final energy use - Commercial (PJ)	116	116	112	106	101	99.4	100
Final energy use - Industry (PJ)	551	582	615	609	632	649	656

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

Item	2020	2025	2030	2035	2040	2045	2050
Electricity distribution capital invested -		3.72	3.8	5.83	6.14	5	5.13
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)	12.8	447	881	2,399	3,918	5,132	6,345
Vehicle stocks - LDV – All others (1000	5,291	5,038	4,785	3,487	2,189	1,238	288
units)							
Light-duty vehicle capital costs vs. REF -		1,020	2,605	4,234	6,409	6,981	6,653
Cumulative 5-yr (million \$2018)							
Public EV charging plugs - DC Fast (1000	0.07		2.03		9.05		14.7
units)							
Public EV charging plugs - L2 (1000 units)	0.285		48.9		217		352

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

Item	2020	2025	2030	2035	2040	2045	2050
Sales of space heating units - Electric	34.1	48.8	80.6	87.8	88.1	88	88
Heat Pump (%)							
Sales of space heating units - Electric	32.6	30.4	12.8	8.81	8.63	8.75	8.76
Resistance (%)							
Sales of space heating units - Gas (%)	27	14.4	4.38	2.16	2.08	2.05	2.05
Sales of space heating units - Fossil (%)	6.33	6.33	2.2	1.25	1.2	1.18	1.18
Sales of water heating units - Electric	0	12.1	64.3	75.9	76.4	76.4	76.4
Heat Pump (%)							
Sales of water heating units - Electric	72.5	72.8	30.8	21.4	21	21	21
Resistance (%)							
Sales of water heating units - Gas Furnace	23.5	12.5	2.34	0.099	0	0	0
(%)							
Sales of water heating units - Other (%)	3.93	2.64	2.61	2.62	2.63	2.63	2.64
Sales of cooking units - Electric	83.7	87.1	97.8	99.9	100	100	100
Resistance (%)							
Sales of cooking units - Gas (%)	16.3	12.9	2.2	0.111	0	0	0
Residential HVAC investment in 2020s vs.		3.86	4.57				
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	11.7	29.4	77	90.8	91.9	92	92
Heat Pump (%)							
Sales of space heating units - Electric	5.83	4.63	4.92	6.27	6.62	6.6	6.56
Resistance (%)							
Sales of space heating units - Gas Furnace	82.5	63.1	17.5	2.95	1.48	1.44	1.44
(%)							
Sales of space heating units - Fossil (%)	0	2.9	0.562	0.024	0	0	0
Sales of water heating units - Electric	0.191	10.6	55.6	65.6	66.1	66.1	66.1
Heat Pump (%)							
Sales of water heating units - Electric	7.05	10.1	28.1	32.2	32.3	32.3	32.3
Resistance (%)							
Sales of water heating units - Gas Furnace	90.8	77.7	14.7	0.619	0	0	0
(%)							
Sales of water heating units - Other (%)	1.97	1.59	1.58	1.59	1.59	1.58	1.57
Sales of cooking units - Electric	43.5	55.3	83.4	88.9	89.2	89.2	89.1
Resistance (%)							
Sales of cooking units - Gas (%)	56.5	44.7	16.6	11.1	10.8	10.8	10.9
Commercial HVAC investment in 2020s -		13,557	15,391				
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)	4,966	0	0	0	0	0	0
Installed thermal - Natural gas (MW)	12,252	11,504	13,287	15,496	13,077	19,510	20,254
Installed thermal - Nuclear (MW)	5,270	5,270	5,270	5,270	2,966	3,464	10,816
Installed renewables - Rooftop PV (MW)	15.5	25	35.4	50.4	71.6	98.9	134
Installed renewables - Solar - Base land	335	335	911	3,967	8,338	12,056	12,056
use assumptions (MW)							
Installed renewables - Solar -	335	335	960	2,883	6,556	9,960	11,277
Constrained land use assumptions (MW)							
Installed renewables - Wind - Constrained	0	0	0	0	0	0	0
land use assumptions (MW)							
Installed renewables - Offshore Wind -	0	0	0	0	0	0	0
Constrained land use assumptions (MW)							
Capital invested - Solar PV - Base (billion		0	0.69	3.37	4.54	3.65	0
\$2018)							
Capital invested - Solar PV - Constrained		0	0.748	2.12	3.82	3.34	1.22
(billion \$2018)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Solar - Base land use assumptions (GWh)	762	762	1,865	7,748	16,195	23,323	23,323
Wind - Base land use assumptions (GWh)	0	0	0	0	0	0	0
OffshoreWind - Base land use assumptions (GWh)	0	0	0	0	0	0	0
Solar - Constrained land use assumptions (GWh)	762	762	1,957	5,634	12,672	19,247	21,780
Wind - Constrained land use assumptions (GWh)	0	0	0	0	0	0	0
OffshoreWind - Constrained land use assumptions (GWh)	0	0	0	0	0	0	0

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Low - Accelerate							-170
regeneration (1000 tCO2e/y)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink notential - Low - Avoid							-317
deforestation (1000 tC02e/v)							011
Carbon Sink potential - Low - Extend							-4,448
rotation length (1000 tC02e/y)							
Carbon sink potential - Low - Improve							-3,133
plantations (1000 tCO2e/y)							
Carbon sink potential - Low - Increase							-7,484
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - Low - Increase							-207
trees outside forests (1000 tC02e/v)							
Carbon sink notential - Low - Reforest							_1 52/
anonland (1000 ±0020 /v)							-1,524
							F 01
Carbon sink polential - Low - Reforest							-531
pasture (1000 tG02e/y)							
Carbon sink potential - Low - Restore							-1,873
productivity (1000 tCO2e/y)							
Carbon sink potential - Low - All (not							-19,687
counting overlap) (1000 tCO2e/y)							
Carbon sink potential - Mid - Accelerate							-255
regeneration (1000 tCO2e/v)							
Carbon sink notential - Mid - Avoid							_1 110
defensetation (1000 t0020/v)							1,110
Control control Mid Extend							0.01/
Carbon sink polentiai - Miu - Exteriu							-8,014
rotation length (1000 tc02e/y)							
Carbon sink potential - Mid - Improve							-4,591
plantations (1000 tCO2e/y)							
Carbon sink potential - Mid - Increase							-14,968
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - Mid - Increase							-400
trees outside forests (1000 tC02e/v)							
Carhon sink notential - Mid - Reforest							-2 286
cropland (1000 \pm CO2e/y)							2,200
Carbon sink notantial Mid Defenset							2760
							-3,100
pasture (1000 tG02e/y)							
Carbon sink potential - Mid - Restore							-3,715
productivity (1000 tCO2e/y)							
Carbon sink potential - Mid - All (not							-39,107
counting overlap) (1000 tCO2e/y)							
Carbon sink potential - High - Accelerate							-340
regeneration (1000 tCO2e/y)							
Carbon sink potential - High - Avoid							-1.902
deforestation (1000 tC02e/v)							.,
Carbon sink notential - High - Extend							_11 580
notation longth (1000 t0020/y)							-11,500
							(150
Carbon sink potential - Hign - Improve							-6,158
plantations (1000 tC02e/y)							
Carbon sink potential - High - Increase							-22,452
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - High - Increase							-592
trees outside forests (1000 tCO2e/y)							
Carbon sink potential - High - Reforest							-3.048
cronland (1000 tC02e/v)							
Carbon sink notential - High - Reforest							-7.006
pasture (1000 tCO2e/y)							1,000
Contrastic potential line All (not							E0 / 0F
							-ᲔᲑ,ᲮᲙჂ
Carbon sink potential - High - Restore							-5,558
productivity (1000 tCO2e/y)							
Land impacted for carbon sink potential -							27.8
Low - Accelerate regeneration (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 -							242
Low - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							2,262
Low - Extend rotation length (1000							, -
hectares)							
Land impacted for carbon sink notential -							1134
Low - Improve plantations (1000							1,101
hectares)							
Land impacted for carbon sink notential -							0
Low Therease retention of HWD (1000							0
hostanos)							
Land impacted for carbon sink notantial							20.4
Land impacted for carbon sink potential -							29.0
(1000 hostonos)							
[1000 Hettares]							101
Land impacted for carbon sink potential -							101
Low - Reforest cropiand (1000 nectares)							
Land impacted for carbon sink potential -							34.5
Low - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							1,115
Low - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							4,946
Low - Total impacted (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							41.7
Mid - Accelerate regeneration (1000							
hectares)							
Land impacted for carbon sink potential -							250
Mid - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							4.084
Mid - Extend rotation length (1000							.,
hectares)							
Land impacted for carbon sink notential -							1707
Mid - Improve plantations (1000 hectares)							1,101
Land impacted for carbon sink notential -							0
Mid - Increase retention of HWD (1000							0
hactaree)							
Lond imported for earbon sink notantial							42.0
Mid Inproceed trace outside forests (1000							42.7
hostoroo)							
Lond imposted for contantial							1 - 1
Land Impacted for carbon sink potential -							151
Mid - Reforest cropiand (1000 neclares)							
Land impacted for carbon sink potential -							249
Mid - Reforest pasture (1000 nectares)							
Land impacted for carbon sink potential -							2,245
Mid - Restore productivity (1000							
hectares							
Land impacted for carbon sink potential -							8,770
Mid - Total impacted (over 30 years) (1000							
hectares)							
Land impacted for carbon sink potential -							55.6
High - Accelerate regeneration (1000							
hectares)							
Land impacted for carbon sink potential -							258
High - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							5,905
High - Extend rotation length (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 -							2,269
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 -							56.3
High - Increase trees outside forests							
(1000 hectares)							
Land impacted for carbon sink potential -							201
High - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							199
High - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							1,842
High - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							10,786
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							-57.1
deployment - Corn-ethanol to energy							
grasses (1000 tCO2e/y)							
Carbon sink potential - Moderate							-1,171
deployment - Cropland measures (1000							
tCO2e/y)							
Carbon sink potential - Moderate							-29.1
deployment - Permanent conservation							
cover (1000 tCO2e/y)							
Carbon sink potential - Moderate							-1,257
deployment - Total (1000 tCO2e/y)							
Carbon sink potential - Aggressive							-57.1
deployment - Corn-ethanol to energy							
grasses (1000 tCO2e/y)							
Carbon sink potential - Aggressive							-2,225
deployment - Cropland measures (1000							
tCO2e/yJ							
Carbon sink potential - Aggressive							-58.1
deployment - Permanent conservation							
cover (1000 tC02e/y)							
Carbon sink potential - Aggressive							-2,340
deployment - Total (1000 tC02e/y)							
Land impacted for carbon sink - Moderate							33
deployment - Corn-ethanol to energy							
grasses (1000 hectares)							
Land Impacted for carbon SINK - Moderate							528
deployment - Cropland measures (1000							
nectaresj							
Land Impacted for carbon SINK - Moderate							52.8
deployment - Permanent conservation							
cover (1000 nectares)							
Land impacted for carbon sink - Moderate							614
aepioyment - Iotal (IUUU nectares)							
Land impacted for carbon sink -							33
Aggressive deployment - Corn-ethanol to							
energy grasses (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 -							1,003
Aggressive deployment - Cropland							
measures (1000 hectares)							
Land impacted for carbon sink -							106
Aggressive deployment - Permanent							
conservation cover (1000 hectares)							
Land impacted for carbon sink -							1,142
Aggressive deployment - Total (1000							
hectares)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Premature deaths from air pollution -		39.9	0.054	0.049	0.031	0.019	0.001
Fuel Comb - Electric Generation - Coal							
(deaths)							
Premature deaths from air pollution -		24.3	15.6	6.62	4.15	2.09	0.857
Fuel Comb - Electric Generation - Natural							
Gas (deaths)							
Premature deaths from air pollution -		113	113	109	97.7	77.3	52.6
Mobile - On-Road (deaths)							
Premature deaths from air pollution - Gas		9.95	9.96	9.54	8.48	6.69	4.59
Stations (deaths)							
Premature deaths from air pollution -		9.02	8.05	7.02	5.74	4.3	2.91
Fuel Comb - Residential - Natural Gas							
(deaths)							
Premature deaths from air pollution -		0.583	0.545	0.509	0.442	0.338	0.23
Fuel Comb - Residential - Oil (deaths)							
Premature deaths from air pollution -		2.02	1.99	1.92	1.72	1.35	0.958
Fuel Comb - Residential - Other (deaths)							
Premature deaths from air pollution -		1.67	1.59	1.5	1.41	1.31	1.22
Fuel Comb - Comm/Institutional - Coal							
(deaths)							
Premature deaths from air pollution -		5.32	5.2	4.94	4.35	3.49	2.6
Fuel Comb - Comm/Institutional - Natural							
Gas (deaths)							
Premature deaths from air pollution -		0.966	0.876	0.79	0.68	0.56	0.447
Fuel Comb - Comm/Institutional - Oil							
(deaths)							
Premature deaths from air pollution -		0.566	0.507	0.45	0.394	0.34	0.29
Fuel Comb - Comm/Institutional - Other							
(deaths)							
Premature deaths from air pollution -		18.9	15	15	15	15.3	15.2
Industrial Processes - Coal Mining							
(deaths)							
Premature deaths from air pollution -		47.2	41.6	34.7	29.2	25.2	17.8
Industrial Processes - Oil & Gas							
Production (deaths)							
Monetary damages from air pollution -		354	0.481	0.436	0.278	0.172	0.012
Fuel Comb - Electric Generation - Coal							
(million \$2019)							
Monetary damages from air pollution -		215	138	58.7	36.8	18.5	7.59
Fuel Comb - Electric Generation - Natural							
Gas (million \$2019)							
Monetary damages from air pollution -		1,002	1,004	970	869	687	468
Mobile - On-Road (million \$2019)							
Monetary damages from air pollution -		88.1	88.2	84.5	75.1	59.3	40.6
Gas Stations (million \$2019)							
Monetary damages from air pollution -		79.9	71.4	62.2	50.9	38.1	25.8
Fuel Comb - Residential - Natural Gas							
(million \$2019)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Monetary damages from air pollution - Fuel Comb - Residential - Oil (million \$2019)		5.17	4.83	4.51	3.92	2.99	2.04
Monetary damages from air pollution - Fuel Comb - Residential - Other (million \$2019)		17.9	17.6	17	15.3	12	8.49
Monetary damages from air pollution - Fuel Comb - Comm/Institutional - Coal (million \$2019)		14.8	14.1	13.3	12.5	11.6	10.8
Monetary damages from air pollution - Fuel Comb - Comm/Institutional - Natural Gas (million \$2019)		47.1	46	43.7	38.5	30.9	23
Monetary damages from air pollution - Fuel Comb - Comm/Institutional - Oil (million \$2019)		8.55	7.75	6.99	6.02	4.96	3.96
Monetary damages from air pollution - Fuel Comb - Comm/Institutional - Other (million \$2019)		5.01	4.49	3.98	3.49	3.01	2.57
Monetary damages from air pollution - Industrial Processes - Coal Mining (million \$2019)		167	132	132	132	135	134
Monetary damages from air pollution - Industrial Processes - Oil & Gas Production (million \$2019)		419	369	308	260	223	158

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

Item	2020	2025	2030	2035	2040	2045	2050
By economic sector - Agriculture (jobs)		231	324	481	1,635	2,073	1,842
By economic sector - Construction (jobs)		6,503	13,581	13,169	13,400	19,458	27,218
By economic sector - Manufacturing		4,391	4,766	4,631	4,925	5,869	6,650
(jobs)							
By economic sector - Mining (jobs)		5,163	3,866	3,040	2,359	1,875	1,245
By economic sector - Other (jobs)		341	1,646	1,464	1,717	3,268	5,672
By economic sector - Pipeline (jobs)		662	988	1,162	901	910	963
By economic sector - Professional (jobs)		4,157	5,779	5,494	7,893	11,393	14,361
By economic sector - Trade (jobs)		3,051	4,095	3,751	4,511	6,512	8,949
By economic sector - Utilities (jobs)		11,794	14,093	14,763	14,699	17,658	21,552
By resource sector - Biomass (jobs)		920	872	1,627	6,864	9,592	8,689
By resource sector - CO2 (jobs)		6.79	3,865	6,224	4,638	5,557	6,699
By resource sector - Coal (jobs)		3,133	1,715	1,499	1,314	1,189	1,053
By resource sector - Grid (jobs)		12,153	15,151	16,288	17,568	25,591	34,576
By resource sector - Natural Gas (jobs)		9,823	7,903	5,608	5,541	4,111	3,288
By resource sector - Nuclear (jobs)		2,660	2,618	2,576	2,308	1,322	414
By resource sector - Oil (jobs)		6,294	5,425	4,694	4,032	3,172	1,811
By resource sector - Solar (jobs)		584	10,577	8,500	9,194	17,748	30,736
By resource sector - Wind (jobs)		719	1,011	939	582	733	1,187
By education level - All sectors - High		15,059	20,919	20,509	22,330	29,711	38,072
school diploma or less (jobs)							
By education level - All sectors -		11,233	15,577	15,252	16,115	21,533	28,158
Associates degree or some college (jobs)							
By education level - All sectors -		7,832	9,887	9,545	10,544	13,731	17,165
Bachelors degree (jobs)							
By education level - All sectors - Masters		1,914	2,418	2,332	2,656	3,504	4,391
or professional degree (jobs)							
By education level - All sectors - Doctoral		256	335	316	395	537	667
degree (jobs)							
Related work experience - All sectors -		5,167	7,128	7,004	7,638	10,182	13,109
None (jobs)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Related work experience - All sectors - Up		6,958	9,719	9,479	10,593	14,255	18,277
to 1 year (jobs)							
Related work experience - All sectors - 1		13,358	17,790	17,336	18,741	24,719	31,601
to 4 years (jobs)							
Related work experience - All sectors - 4		8,513	11,487	11,206	11,962	15,799	20,297
to 10 years (jobs)							
Related work experience - All sectors -		2,297	3,012	2,929	3,108	4,060	5,168
Over 10 years (jobs)							
On-the-Job Training - All sectors - None		1,913	2,629	2,536	2,809	3,771	4,856
(jobs)							
On-the-Job Training - All sectors - Up to 1		24,093	32,002	31,206	34,408	45,491	57,754
year (jobs)							
On-the-Job Training - All sectors - 1 to 4		7,633	10,573	10,351	10,816	14,346	18,681
years (jobs)							
On-the-Job Training - All sectors - 4 to 10		2,332	3,466	3,412	3,540	4,787	6,352
years (jobs)							
On-the-Job Training - All sectors - Over 10		322	467	449	468	621	809
years (jobs)							
On-Site or In-Plant Training - All sectors -		5,709	7,832	7,609	8,377	11,160	14,319
None (jobs)							
On-Site or In-Plant Training - All sectors -		21,943	29,187	28,466	31,210	41,269	52,505
Up to 1 year (jobs)							
On-Site or In-Plant Training - All sectors -		5,918	8,175	8,000	8,405	11,153	14,495
1 to 4 years (jobs)							
On-Site or In-Plant Training - All sectors -		2,426	3,518	3,457	3,602	4,830	6,342
4 to 10 years (jobs)							
On-Site or In-Plant Training - All sectors -		297	426	423	448	604	792
Over 10 years (jobs)							
Wage income - All (million \$2019)		1,943	2,581	2,553	2,794	3,704	4,759

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

Item	2020	2025	2030	2035	2040	2045	2050
Final energy use - Transportation (PJ)	546	513	465	427	397	363	322
Final energy use - Residential (PJ)	163	154	147	140	131	121	113
Final energy use - Commercial (PJ)	116	116	115	113	110	107	105
Final energy use - Industry (PJ)	551	582	616	613	638	655	660

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

Item	2020	2025	2030	2035	2040	2045	2050
Electricity distribution capital invested -		3.04	3.04	3.84	3.93	5.22	5.46
Cumulative 5-yr (billion \$2018)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Vehicle stocks - LDV - EV (1000 units)	9.9/	138	265	856	1/1/7	2 756	/, 06/,
	7.74	5.010	200	5 000	1,441	2,100	4,004
Venicie stocks - LDV – Ali others (1000	5,312	5,312	5,312	5,039	4,766	3,672	2,579
units)							
Light-duty vehicle capital costs vs. REF -		0	163	347	1,168	3,685	5,365
Cumulative 5-yr (million \$2018)							
Public EV charging plugs - DC Fast (1000	0.07		0.612		3.34		9.39
units)							
Public EV charging plugs - L2 (1000 units)	0.285		14.7		80.3		225

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

Item	2020	2025	2030	2035	2040	2045	2050
Sales of space heating units - Electric	34.1	42.7	46.3	56.9	72.9	83.2	86.8
Heat Pump (%)							
Sales of space heating units - Electric	32.6	33.8	31.7	25.8	17	11.4	9.4
Resistance (%)							
Sales of space heating units - Gas (%)	27	16.4	15.2	12.1	7.04	3.65	2.47
Sales of space heating units - Fossil (%)	6.33	7.13	6.71	5.24	3.12	1.79	1.34
Sales of water heating units - Electric	0	2.09	8.02	25.1	51.3	68.4	74.3
Heat Pump (%)							
Sales of water heating units - Electric	72.5	80.9	76.2	62.3	41.2	27.4	22.6
Resistance (%)							
Sales of water heating units - Gas Furnace	23.5	14.4	13.2	9.97	4.91	1.56	0.408
(%)							
Sales of water heating units - Other (%)	3.93	2.64	2.61	2.64	2.65	2.64	2.64
Sales of cooking units - Electric	83.6	84	85.5	89.5	95	98.4	99.6
Resistance (%)							
Sales of cooking units - Gas (%)	16.4	16	14.5	10.5	5.01	1.62	0.435
Residential HVAC investment in 2020s vs.		3.81	4.31				
REF - Cumulative 5-yr (billion \$2018)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Sales of space heating units - Electric	11.7	20.3	25.7	41.5	66.1	83.2	89.6
Heat Pump (%)							
Sales of space heating units - Electric	5.83	4.63	4.65	4.79	5.28	5.94	6.33
Resistance (%)							
Sales of space heating units - Gas Furnace	82.5	71.7	66.5	51.3	27.4	10.5	3.93
(%)							
Sales of space heating units - Fossil (%)	0	3.35	3.16	2.4	1.19	0.387	0.102
Sales of water heating units - Electric	0.191	1.96	7.08	21.8	44.4	59.2	64.3
Heat Pump (%)							
Sales of water heating units - Electric	7.05	6.58	8.46	14.5	23.6	29.5	31.6
Resistance (%)							
Sales of water heating units - Gas Furnace	90.8	89.9	82.9	62.1	30.4	9.73	2.53
(%)							
Sales of water heating units - Other (%)	1.97	1.59	1.58	1.59	1.59	1.58	1.57
Sales of cooking units - Electric	43.5	47.1	51.3	61.6	76.1	85	88
Resistance (%)							
Sales of cooking units - Gas (%)	56.5	52.9	48.7	38.4	23.9	15	12
Commercial HVAC investment in 2020s -		13,551	15,374				
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)	4,966	706	0	0	0	0	0
Installed thermal - Natural gas (MW)	12,492	21,550	19,073	15,754	11,207	8,808	9,072
Installed thermal - Nuclear (MW)	5,270	5,270	5,270	5,270	4,118	888	888
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	7.01	16.4	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	7,863	26,215	26,215	26,215

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

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

Table 58: E-B+ scenario	PILLAR 3: Cl	lean 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	6	20	20	20
(quantity)							
Number of facilities - Allam power w ccu	0	0	0	0	0	0	0
(quantity)							
Number of facilities - Beccs hydrogen	0	0	0	1	10	21	21
(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	1	2	2	2
(quantity)							
Number of facilities - Sng (quantity)	0	0	0	0	0	0	0
Number of facilities - Sng ccu (quantity)	0	0	0	0	0	0	0
Conversion capital investment -		0	0	6,531	22,561	9,661	0
Cumulative 5-yr (million \$2018)							
Biomass purchases (million \$2018/y)		0	0	479	2,220	3,039	3,039

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

Item	2020	2025	2030	2035	2040	2045	2050
Annual - All (MMT)		0	3.24	11.2	39.1	55	55.8
Annual - BECCS (MMT)		0	0	7.89	35.8	48.2	48.1
Annual - NGCC (MMT)		0	0	0	0	0	0.69
Annual - Cement and lime (MMT)		0	3.24	3.35	3.32	6.84	7.07
Cumulative - All (MMT)		0	3.24	14.5	53.6	109	164
Cumulative - BECCS (MMT)		0	0	7.89	43.6	91.8	140
Cumulative - NGCC (MMT)		0	0	0	0	0	0.69
Cumulative - Cement and lime (MMT)		0	3.24	6.59	9.91	16.8	23.8

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

Item	2020	2025	2030	2035	2040	2045	2050
Trunk (km)		0	335	669	669	669	669
Spur (km)		0	313	1,335	2,177	3,443	3,639
All (km)		0	648	2,004	2,846	4,113	4,308
Cumulative investment - Trunk (million \$2018)		0	1,872	3,743	3,869	3,869	3,869
Cumulative investment - Spur (million \$2018)		0	221	1,388	2,806	4,123	4,183
Cumulative investment - All (million \$2018)		0	2,093	5,131	6,675	7,991	8,051

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

Item	2020	2025	2030	2035	2040	2045	2050
Annual (MMT)		0	3.69	15	30.9	43.3	46.8
Injection wells (wells)		0	4	14	26	44	56
Resource characterization, appraisal,		14.6	361	580	580	580	580
permitting costs (million \$2020)							
Wells and facilities construction costs		0	114	446	795	1,330	1,651
(million \$2020)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink notential - Low - Accelerate							-170
regeneration (1000 tC02e/v)							110
Carbon sink notantial Low Avoid							
defendentation (1000 ±0020 /v)							-317
Oenhon sink notential Low Extend							
Carbon Sink potential - Low - Extend							-4,448
rotation length (1000 tC02e/y)							
Carbon sink potential - Low - Improve							-3,133
plantations (1000 tCO2e/y)							
Carbon sink potential - Low - Increase							-7,484
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - Low - Increase							-207
trees outside forests (1000 tCO2e/y)							
Carbon sink potential - Low - Reforest							-1,524
cropland (1000 tCO2e/v)							, -
Carbon sink notential - Low - Reforest							-531
$p_{asture} (1000 \pm 0.02 e/v)$							001
Carbon sink notantial Low Restore							1 072
cal boll slik polentiai - Low - Restore							-1,013
							10 (07
Carbon sink potential - Low - All (not							-19,687
counting overlap) (1000 tC02e/y)							
Carbon sink potential - Mid - Accelerate							-255
regeneration (1000 tCO2e/y)							
Carbon sink potential - Mid - Avoid							-1,110
deforestation (1000 tCO2e/y)							
Carbon sink potential - Mid - Extend							-8.014
rotation length (1000 tCO2e/v)							-,-
Carbon sink notential - Mid - Improve							-4 591
plantations (1000 tC02e/y)							4,071
Contractions (1000 (0026/y)							1/. 0/ 9
cal buil sink potential - Miu - Increase							-14,900
Carbon sink potential - Mid - Increase							-400
trees outside forests (1000 tC02e/y)							
Carbon sink potential - Mid - Reforest							-2,286
cropland (1000 tCO2e/y)							
Carbon sink potential - Mid - Reforest							-3,768
pasture (1000 tCO2e/y)							
Carbon sink potential - Mid - Restore							-3,715
productivity (1000 tCO2e/y)							
Carbon sink notential - Mid - All (not							-39,107
counting overlan) (1000 tC02e/v)							07,101
Carbon sink notential - High - Accelerate							-3/10
nogeneration (1000 tC020/y)							-040
Control of the stantial High Avoid							1000
dafanastation (1000 t000s (v)							-1,902
Carbon sink potential - Hign - Extend							-11,580
rotation length (1000 tCO2e/y)							
Carbon sink potential - High - Improve							-6,158
plantations (1000 tCO2e/y)							
Carbon sink potential - High - Increase							-22,452
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - High - Increase							-592
trees outside forests (1000 tCO2e/v)							
Carbon sink notential - High - Reforest							-3 048
cronland (1000 tC02e/v)							0,040
Carbon sink notantial High Defenset							.7004
oai buli silik puteritiai - Alyri - Kelurest paetupa (1000 teoga /y)							-1,000
Pasture (1000 to028/9)							
Carbon Sink potential - High - All (not							-58,635
counting overlapj (1000 tCO2e/y)							
Carbon sink potential - High - Restore							-5,558
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 notential -							278
Low - Accelerate regeneration (1000							21.0
hectares)							
Land impacted for carbon sink notantial							2/.0
Land impacted for carbon Sink potential -							242
(1000 hostopos)							
Land impacted for carbon sink potential -							2,262
Low - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							1,134
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 -							29.6
Low - Increase trees outside forests							27.0
(1000 hectares)							
Land impacted for earbon sink notantial							101
Lanu inipacteu ior carbon sink potential -							101
Low - Reforest cropiand (1000 nectares)							
Land impacted for carbon sink potential -							34.5
Low - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							1,115
Low - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							4,946
Low - Total impacted (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink notential -							417
Mid - Accelerate regeneration (1000							
hactares)							
Land impacted for earbon sink notantial							250
Mid Avoid defensetation (even 20 veens)							250
Milu - Avolu delorestation (over 30 years)							
Land impacted for carbon sink potential -							4,084
Mid - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							1,707
Mid - Improve plantations (1000 hectares)							
Land impacted for carbon sink potential -							0
Mid - Increase retention of HWP (1000							
hectares							
Land impacted for carbon sink notential -							42.9
Mid - Increase trees outside forests (1000							12.7
hectaree)							
Land impacted for earbon sink notantial							151
Mid Defenset evenland (1000 besteres)							151
Mid - Reforest cropiand (1000 nectares)							
Land impacted for carbon sink potential -							249
Mid - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							2,245
Mid - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							8,770
Mid - Total impacted (over 30 years) (1000							
hectares)							
Land impacted for carbon sink notential -							55.6
High - Accelerate regeneration (1000							00.0
hertaree)							
Land imported for earther sink natorticl							050
Lanu impacteu iur Carbuit Sink potential -							258
HIGH - AVOID DEFORESTATION (OVER 30 YEARS)							
(IUUU nectares)							

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 -							5,905
High - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							2,269
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 -							56.3
High - Increase trees outside forests							
(1000 hectares)							
Land impacted for carbon sink potential -							201
High - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							199
High - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							1,842
High - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							10,786
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	2040	2040	-216
denloyment - Corn-ethanol to energy							210
grasses (1000 tC02e/v)							
Carbon sink potential - Moderate							-1.085
deployment - Cropland measures (1000							.,
tCO2e/y)							
Carbon sink potential - Moderate							-26.6
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							-1,328
deployment - Total (1000 tCO2e/y)							
Carbon sink potential - Aggressive							-216
deployment - Corn-ethanol to energy							
grasses (1000 tCO2e/y)							
Carbon sink potential - Aggressive							-2,063
deployment - Cropland measures (1000							
tCO2e/y)							
Carbon sink potential - Aggressive							-53.1
deployment - Permanent conservation							
cover (1000 tCO2e/y)							
Carbon sink potential - Aggressive							0
deployment - Cropland to woody energy							
crops (1000 tC02e/y)							
Carbon sink potential - Aggressive							0
deployment - Pasture to energy crops							
(1000 tC02e/y)							
Carbon sink potential - Aggressive							-2,332
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	2020	2020	2000	2000	2010	2010	118
deployment - Corn-ethanol to energy							
grasses (1000 hectares)							
Land impacted for carbon sink - Moderate							485
deployment - Cropland measures (1000							
hectares)							
Land impacted for carbon sink - Moderate							48.3
deployment - Permanent conservation							
cover (1000 hectares)							
Land impacted for carbon sink - Moderate							45.6
deployment - Cropland to woody energy							
crops (1000 hectares)							
Land impacted for carbon sink - Moderate							327
deployment - Pasture to energy crops							
(1000 hectares)							
Land impacted for carbon sink - Moderate							1,024
deployment - Total (1000 hectares)							
Land impacted for carbon sink -							118
Aggressive deployment - Corn-ethanol to							
energy grasses (1000 hectares)							
Land impacted for carbon sink -							2,276
Aggressive deployment - Cropland							
measures (1000 hectares)							
Land impacted for carbon sink -							96.7
Aggressive deployment - Permanent							
conservation cover (1000 hectares)							
Land impacted for carbon sink -							45.6
Aggressive deployment - Cropland to							
woody energy crops (1000 hectares)							
Land impacted for carbon sink -							327
Aggressive deployment - Pasture to							
energy crops (1000 hectares)							
Land impacted for carbon sink -							2,863
Aggressive deployment - Total (1000							
hectares							

Table 64: REF scenario - IMPACTS - Health

Item	2020	2025	2030	2035	2040	2045	2050
Premature deaths from air pollution -		163	110	84.2	74	69.8	69.4
Fuel Comb - Electric Generation - Coal							
(deaths)							
Premature deaths from air pollution -		23.3	24.2	25	27.9	27.4	29.6
Fuel Comb - Electric Generation - Natural							
Gas (deaths)							
Premature deaths from air pollution -		113	114	116	119	121	124
Mobile - On-Road (deaths)							
Premature deaths from air pollution - Gas		9.91	10	10.1	10.3	10.4	10.6
Stations (deaths)							
Premature deaths from air pollution -		8.85	7.88	7.03	6.5	6.25	6.06
Fuel Comb - Residential - Natural Gas							
(deaths)							
Premature deaths from air pollution -		0.571	0.482	0.355	0.24	0.154	0.104
Fuel Comb - Residential - Oil (deaths)							
Premature deaths from air pollution -		1.9	1.81	1.74	1.72	1.71	1.68
Fuel Comb - Residential - Other (deaths)							
Premature deaths from air pollution -		1.75	1.74	1.72	1.7	1.68	1.64
Fuel Comb - Comm/Institutional - Coal							
(deaths)							

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

Ttom			0000	0005	00/0	00/5	0050
	2020	2025	2030	2035	2040	2045	2050
Premature deaths from air pollution -		5.34	5.16	4.68	4.19	3.96	4.01
Fuel Comb - Comm/Institutional - Natural							
Gas (deaths)							
Premature deaths from air pollution -		1	0.986	0.952	0.9	0.859	0.838
Fuel Comb - Comm/Institutional - Oil							
(deaths)							
Premature deaths from air pollution -		0.592	0.602	0.612	0.621	0.63	0.64
Fuel Comb. Comm/Institutional Other		0.072	0.002	0.012	0.021	0.00	0.04
(deethe)							
				10.0		10 (
Premature deaths from air pollution -		25.7	21.5	19.9	19.5	19.6	19.1
Industrial Processes - Coal Mining							
(deaths)							
Premature deaths from air pollution -		47.5	50.3	51.5	49	48.8	46.1
Industrial Processes - Oil & Gas							
Droduction (deaths)							
Monotony domagon from ain pollution		1449	070	7/.7	455	610	
Monetary utiliages from an polition -		1,443	910	(4)	655	019	615
Fuel Comb - Electric Generation - Coal							
(million \$2019)							
Monetary damages from air pollution -		206	214	222	247	242	262
Fuel Comb - Electric Generation - Natural							
Gas (million \$2019)							
Monetary damages from air pollution -		1 0 0 1	1 017	1034	1055	1 077	1 099
Mobile On Read (million \$2010)		1,001	1,011	1,004	1,000	1,011	1,077
Mobile - Oll-Rodu (Illillion #2017)		07.0	00.0	007	01.0	00 5	
Monetary damages from air pollution -		87.8	88.9	89.7	91.2	92.5	93.5
Gas Stations (million \$2019)							
Monetary damages from air pollution -		78.5	69.8	62.3	57.6	55.4	53.7
Fuel Comb - Residential - Natural Gas							
(million \$2019)							
Monetary damages from air pollution -		5.06	4.27	3.14	2.13	1.36	0.921
Fuel Comh - Residential - Oil (million							
¢2010)							
Vanatany domagon from air rollution		1/ 0	1/	15 5	15.0	1 - 1	1/ 0
Monetary damages from air poliution -		16.9	16	15.5	15.3	15.1	14.9
Fuel Comb - Residential - Other (million							
\$2019]							
Monetary damages from air pollution -		15.5	15.4	15.3	15.1	14.8	14.5
Fuel Comb - Comm/Institutional - Coal							
(million \$2019)							
Monetary damages from air pollution -		47.3	45.6	415	371	35	35.5
Eucl Comb Comm/Institutional Natural		41.0	40.0	41.0	01.1	00	00.0
Cas (million #2010)							
			0.70		7.07	7.4	
Monetary damages from air pollution -		8.86	8.73	8.43	1.97	7.61	7.42
Fuel Comb - Comm/Institutional - Oil							
(million \$2019)							
Monetary damages from air pollution -		5.24	5.32	5.42	5.5	5.57	5.66
Fuel Comb - Comm/Institutional - Other							
(million \$2019)							
Monetary damages from air pollution	+	707	100	175	170	172	120
Monetary damages if offi all pollution -		221	107	113	172	113	100
Industrial Processes - Coal Mining							
[million \$2019]							
Monetary damages from air pollution -		422	446	458	436	433	409
Industrial Processes - Oil & Gas							
Production (million \$2019)							

Table 65: REF scenario - IMPACTS - Jobs

Item	2020	2025	2030	2035	2040	2045	2050
By economic sector - Agriculture (jobs)		219	197	194	158	158	171
By economic sector - Construction (jobs)		6,749	7,057	7,393	6,878	7,840	8,489
By economic sector - Manufacturing		3,544	3,624	3,659	3,576	3,630	3,654
(jobs)							
By economic sector - Mining (jobs)		5,828	4,622	3,771	2,984	2,506	2,036

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

Item	2020	2025	2030	2035	2040	2045	2050
By economic sector - Other (jobs)		335	349	366	344	403	451
By economic sector - Pipeline (jobs)		683	718	731	685	691	680
By economic sector - Professional (jobs)		4.362	4.100	3.994	3.594	3.716	3.765
By economic sector - Trade (jobs)		3.355	3.026	2.838	2,491	2.550	2.545
By economic sector - Utilities (jobs)		12,431	12,467	12,812	11.656	12,640	13,410
By resource sector - Biomass (jobs)		846	792	736	658	673	684
By resource sector - CO2 (jobs)		0	0.024	0.03	0.032	0.036	0.038
By resource sector - Coal (jobs)		4,499	3.178	2.685	1.941	1.488	1.297
By resource sector - Grid (jobs)		13.376	13,749	14.368	12.001	14.592	16.546
By resource sector - Natural Gas (jobs)		9,783	9.978	10.039	10.581	11.277	10.885
By resource sector - Nuclear (jobs)		2.660	2,618	2.576	2.081	1.405	1.383
By resource sector - Oil (jobs)		6.318	5,497	4.886	4,460	4,165	3,792
By resource sector - Solar (jobs)		-,	207	295	296	313	465
By resource sector - Wind (jobs)		23.6	140	172	350	220	151
By education level - All sectors - High		15 660	15 088	14 941	13 513	14 363	14 897
school diploma or less (jobs)		10,000	10,000	,,,	10,010	11,000	11,071
By education level - All sectors -		11 590	11 277	11 242	10 250	10 932	11 328
Associates degree or some college (inhs)		11,070	,2.1.	11,242	10,200	10,702	11,020
By education level - All sectors -		8 021	7.667	7499	6745	6.936	7048
By Suddution Rever (inhs)		0,021	1,001	1,-1,7,7	0,140	0,700	1,040
By education level - All sectors - Masters		1971	1 879	1835	1644	1687	1714
or professional degree (johs)		1,711	1,017	1,000	1,044	1,001	1,114
By education level - All sectors - Doctoral		264	249	240	214	215	215
degree (inhs)		204	247	240	214	210	210
Related work experience - All sectors -		5 334	5 176	5 147	4 680	4 980	5 159
None (inhs)		0,004	0,110	0,141	4,000	4,700	0,107
Related work experience - All sectors - Un		7206	6 912	6 815	6 137	6 475	6700
to 1 year (inhs)		1,200	0,712	0,010	0,101	0,410	0,100
Related work experience - All sectors - 1		13 848	13 305	13 125	11 863	12 473	12 832
to 4 years (inhs)		10,040	10,000	10,120	11,000	12,410	12,002
Related work experience - All sectors - 4		8 771	8 497	8 427	7.653	8 079	8 326
to 10 years (jobs)		0,111	0,171	0,121	1,000	0,017	0,020
Related work experience - All sectors -		2 347	2 270	2 244	2 032	2 126	2 185
Over 10 years (iobs)		_,0	_,	_,_ · · ·	_,	_,0	_,
On-the-Job Training - All sectors - None		1.965	1.885	1.851	1.663	1.728	1.773
(iobs)		.,	.,	.,	.,	.,	.,
On-the-Job Training - All sectors - Up to 1		24.883	23.867	23.503	21.208	22.243	22.879
vear (iobs)		,===			,		
On-the-Job Training - All sectors - 1 to 4		7,894	7.685	7.662	6,980	7,440	7,710
vears (jobs)							
On-the-Job Training - All sectors - 4 to 10		2,441	2,407	2,428	2,228	2,421	2,532
years (jobs)		,	, -	, -	• -	,	,
On-the-Job Training - All sectors - Over 10		323	316	314	287	300	309
vears (iobs)				_			
On-Site or In-Plant Training - All sectors -		5,841	5,641	5,575	5,049	5.291	5,443
None (jobs)		-,-	-,-	-,	-,-	-,	-, -
On-Site or In-Plant Training - All sectors -		22,704	21,776	21,450	19,353	20,320	20,914
Up to 1 year (jobs)		, -	, -	,		-,	
On-Site or In-Plant Training - All sectors -		6,125	5.951	5.925	5,390	5,740	5,946
1 to 4 years (jobs)		-, -	-, -	-, -	-,	-, -	-, -
On-Site or In-Plant Training - All sectors -		2.530	2.488	2.501	2.291	2.473	2.576
4 to 10 years (jobs)		,	,	-,	-,		-,
On-Site or In-Plant Training - All sectors -		306	304	307	283	309	323
Over 10 years (jobs)							
Wage income - All (million \$2019)		2,011	1,963	1,965	1,800	1,915	1,997
		·	·	•			•

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

Item	2020	2025	2030	2035	2040	2045	2050
Final energy use - Transportation (PJ)	546	512	468	441	440	453	469

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

			•	-			
Item	2020	2025	2030	2035	2040	2045	2050
Final energy use - Residential (PJ)	163	154	151	149	149	150	153
Final energy use - Commercial (PJ)	116	118	119	119	120	124	129
Final energy use - Industry (PJ)	551	594	623	639	664	684	709

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

Item	2020	2025	2030	2035	2040	2045	2050
Electricity distribution capital invested -		4.01	4.13	5.56	5.83	5.01	5.15
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	32.1	57	57.8	59.1	60.4	62.1	64.7
Heat Pump (%)							
Sales of space heating units - Electric	33.6	26.8	26.4	25.6	24.5	23	20.3
Resistance (%)							
Sales of space heating units - Gas (%)	27.8	12.1	11.7	11.3	11.2	11.1	11.1
Sales of space heating units - Fossil (%)	6.48	4.04	4.09	4.01	3.92	3.88	3.9
Sales of water heating units - Electric	0	0	0	0	0	0	0
Heat Pump (%)							
Sales of water heating units - Electric	72.5	82.6	82.7	82.5	82.4	82.4	82.3
Resistance (%)							
Sales of water heating units - Gas Furnace	23.5	14.8	14.7	14.9	15	15	15
(%)							
Sales of water heating units - Other (%)	3.93	2.64	2.61	2.64	2.66	2.66	2.66
Sales of cooking units - Electric	83.5	83.5	83.5	83.5	83.5	83.5	83.5
Resistance (%)							
Sales of cooking units - Gas (%)	16.5	16.5	16.5	16.5	16.5	16.5	16.5
Residential HVAC investment in 2020s vs.		3.76	3.8				
REF - Cumulative 5-yr (billion \$2018)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Sales of space heating units - Electric	11.7	32	71.2	79	79.3	79.3	79.4
Heat Pump (%)							
Sales of space heating units - Electric	5.83	6.42	12	15.8	18.7	19.2	19.2
Resistance (%)							
Sales of space heating units - Gas Furnace	82.5	58.9	16.3	5.24	1.95	1.49	1.44
(%)							
Sales of space heating units - Fossil (%)	0	2.68	0.471	0.024	0	0	0
Sales of water heating units - Electric	0.191	0.157	0.15	0.153	0.152	0.148	0.15
Heat Pump (%)							
Sales of water heating units - Electric	7.05	5.85	5.67	5.75	5.7	5.62	5.68
Resistance (%)							
Sales of water heating units - Gas Furnace	90.8	92.4	92.6	92.5	92.6	92.7	92.6
(%)							
Sales of water heating units - Other (%)	1.97	1.59	1.58	1.59	1.59	1.58	1.57
Sales of cooking units - Electric	43.5	45.6	45.9	45.7	46	45.9	45.7
Resistance (%)							
Sales of cooking units - Gas (%)	56.5	54.4	54.1	54.3	54	54.1	54.3
Commercial HVAC investment in 2020s -		13,308	13,855				
Cumulative 5-yr (million \$2018)							

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

	,		5				
Item	2020	2025	2030	2035	2040	2045	2050
Installed thermal - Coal (MW)	4,966	2,116	2,116	2,116	0	0	0
Installed thermal - Natural gas (MW)	12,172	20,490	21,782	21,004	19,787	28,937	33,926

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

		· · · · · •	J 1 / (···· ,			
Item	2020	2025	2030	2035	2040	2045	2050
Installed thermal - Nuclear (MW)	5,270	5,270	5,270	5,270	2,966	2,966	2,966
Installed renewables - Rooftop PV (MW)	15.5	25	35.4	50.4	71.6	98.9	134
Installed renewables - Solar - Base land	335	335	335	335	335	335	335
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)	762	762	762	762	762	762	762
Wind - Base land use assumptions (GWh)	0	0	0	0	0	0	0
OffshoreWind - Base land use assumptions (GWh)	0	0	0	0	0	0	0

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

Item	2020	2025	2030	2035	2040	2045	2050
Business-as-usual carbon sink - Natural	-56.9		-17.8				-14.4
uptake (Mt CO2e/y)							
Business-as-usual carbon sink - Retained	-6.11		-10.2				-10.7
in Hardwood Products (Mt CO2e/y)							
Business-as-usual carbon sink - Total (Mt	-63		-28				-25.1
CO2e/y)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Low - Accelerate							-170
regeneration (1000 tCO2e/y)							
Carbon sink potential - Low - Avoid							-317
deforestation (1000 tCO2e/y)							
Carbon sink potential - Low - Extend							-4,448
rotation length (1000 tCO2e/y)							
Carbon sink potential - Low - Improve							-3,133
plantations (1000 tCO2e/y)							
Carbon sink potential - Low - Increase							-7,484
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - Low - Increase							-207
trees outside forests (1000 tCO2e/y)							
Carbon sink potential - Low - Reforest							-1,524
cropland (1000 tCO2e/y)							
Carbon sink potential - Low - Reforest							-531
pasture (1000 tCO2e/y)							
Carbon sink potential - Low - Restore							-1,873
productivity (1000 tCO2e/y)							
Carbon sink potential - Low - All (not							-19,687
counting overlap) (1000 tCO2e/y)							
Carbon sink potential - Mid - Accelerate							-255
regeneration (1000 tCO2e/y)							
Carbon sink potential - Mid - Avoid							-1,110
deforestation (1000 tCO2e/y)							
Carbon sink potential - Mid - Extend							-8,014
rotation length (1000 tCO2e/y)							
Carbon sink potential - Mid - Improve							-4,591
plantations (1000 tCO2e/y)							
Carbon sink potential - Mid - Increase							-14,968
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - Mid - Increase							-400
trees outside forests (1000 tCO2e/y)							
Carbon sink potential - Mid - Reforest							-2,286
cropland (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							-3,768
pasture (1000 tCO2e/v)							-,
Carbon sink notential - Mid - Restore							-3 715
productivity (1000 tC02e/y)							0,110
Carbon sink notantial Mid All (not							20107
cal bolt sink potential - Mid - All (not							-39,101
							0/0
Carbon sink potential - Hign - Accelerate							-340
regeneration (1000 tC02e/y)							
Carbon sink potential - High - Avoid							-1,902
deforestation (1000 tCO2e/y)							
Carbon sink potential - High - Extend							-11,580
rotation length (1000 tCO2e/y)							
Carbon sink potential - High - Improve							-6,158
plantations (1000 tCO2e/y)							
Carbon sink notential - High - Increase							-22 452
retention of HWP (1000 tC02e/v)							22,102
Carbon sink notential - High - Increase							-592
troos outsido forosts (1000 tC020/v)							-072
Control cink notontial Uigh Defenset							2.04.0
							-3,048
Carbon sink potential - High - Reforest							-7,006
pasture (1000 tCO2e/y)							
Carbon sink potential - High - All (not							-58,635
counting overlap) (1000 tCO2e/y)							
Carbon sink potential - High - Restore							-5,558
productivity (1000 tCO2e/y)							
Land impacted for carbon sink notential -							27.8
Low - Accelerate regeneration (1000							2110
hertares)							
Land impacted for carbon sink notantial							2/.0
Land impacted for carbon Sink potential -							242
(1000 hastanas)							
Land impacted for carbon sink potential -							2,262
Low - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							1,134
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 -							29.6
Low - Increase trees outside forests							27.0
(1000 bostores)							
Lond imposted for contantial							101
Lanu impacteu for carbon sink potential -							101
Low - Reforest cropiand (1000 nectares)							
Land impacted for carbon sink potential -							34.5
Low - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							1,115
Low - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							4,946
Low - Total impacted (over 30 vears)							
(1000 hectares)							
Land impacted for carbon sink notential							<u>/</u> 17
Mid - Accelerate regeneration (1000							71.1
hertares)							
Land impacted for carbon sink potential							250
Mid Avoid defenestation (over 20 vers)							200
(1000 hostonos)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Land impacted for carbon sink potential -							4,084
Mid - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							1,707
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 -							42.9
Mid - Increase trees outside forests (1000							
hectares)							
Land impacted for carbon sink notential -							151
Mid - Reforest cronland (1000 bectares)							101
Land impacted for carbon sink notential -							2/19
Mid - Peforest pasture (1000 bectares)							247
Land impacted for carbon sink potential							2.07.5
Mid Postono productivity (1000							2,245
Miu - Restore productivity (1000							
lend imported for earbon sink notantial							0.770
Land Impacted for carbon sink potential -							8,770
Mid - Total impacted (over 30 years) (1000							
nectares)							
Land impacted for carbon sink potential -							55.6
High - Accelerate regeneration (1000							
hectaresj							
Land impacted for carbon sink potential -							258
High - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							5,905
High - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							2,269
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 -							56.3
High - Increase trees outside forests							
(1000 hectares)							
Land impacted for carbon sink potential -							201
High - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							199
High - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							1,842
High - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							10,786
High - Total impacted (over 30 years)							- 1
(1000 hectares)							