

# Net-Zero America - Kansas data

## October 29, 2021 (updated January 9, 2022)

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

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Table 1: E+ scenario - IMPACTS - Health

Item	2020	2025	2030	2035	2040	2045	2050
Premature deaths from air pollution -		22.2	0.022	0.021	0.018	0.011	0
Fuel Comb - Electric Generation - Coal			0.011	0.01	0.010	0.011	Ū
(deaths)							
Premature deaths from air pollution -		14	6.93	3.27	2.48	1.53	0.776
Fuel Comb - Electric Generation - Natural			0.70	0.2.			0.1.0
Gas (deaths)							
Premature deaths from air pollution -		45.8	42.9	327	19	8 81	3.67
Mohile - On-Road (deaths)		40.0	42.7	52.1	17	0.01	5.01
Dremature deaths from air pollution - Cas		/. 87	/, 51	3 / 3	2.07	1.05	0.537
Stations (doaths)		4.07	4.51	5.45	2.07	1.05	0.557
Dramatura deaths from sin collution		775	( 00	( 10	0.00	1.01	0.00
Fremature deaths from air poliution -		(.(5	6.28	4.12	2.22	1.01	0.406
Fuel Comp - Residential - Natural Gas							
(deaths)		0.10/	0.100	0.070	0.0/0	0.00	0.007
Premature deaths from air pollution -		0.124	0.103	0.072	0.043	0.02	0.007
Fuel Comb - Residential - Oil (deaths)		-					
Premature deaths from air pollution -		1.43	1.29	0.99	0.641	0.32	0.131
Fuel Comb - Residential - Other (deaths)							
Premature deaths from air pollution -		0.714	0.687	0.656	0.623	0.588	0.551
Fuel Comb - Comm/Institutional - Coal							
(deaths)							
Premature deaths from air pollution -		5.21	4.46	3.26	2.06	1.21	0.67
Fuel Comb - Comm/Institutional - Natural							
Gas (deaths)							
Premature deaths from air pollution -		0.768	0.626	0.495	0.374	0.267	0.173
Fuel Comb - Comm/Institutional - Oil							
(deaths)							
Premature deaths from air nollution -		0 427	0.36	0 294	0.23	0 169	0 112
Fuel Comb - Comm/Institutional - Other		0.421	0.00	0.274	0.20	0.107	0.112
(deaths)							
Premature deaths from air pollution -		1.04	0 381	0 371	0 359	0 356	0 349
Industrial Processes - Coal Mining		1.04	0.501	0.011	0.007	0.000	0.047
(deathe)							
Dromature deaths from air pollution		0/.7	90.7	7/. 7	59.4	1.1. 0	07.0
Industrial Processon, Oil S Coo		04.1	00.1	(4.)	56.0	44.2	21.0
Industrial Processes - On & Gas							
Production (deaths)		107	0.105	0.107	0.157	0.100	0.000
Monetary damages from air pollution -		197	0.195	0.187	0.156	0.102	0.002
Fuel Comb - Electric Generation - Coal							
(million \$2019)		-					
Monetary damages from air pollution -		124	61.4	29	22	13.5	6.88
Fuel Comb - Electric Generation - Natural							
Gas (million \$2019)							
Monetary damages from air pollution -		408	381	291	169	78.3	32.6
Mobile - On-Road (million \$2019)							
Monetary damages from air pollution -		43.1	39.9	30.4	18.3	9.27	4.76
Gas Stations (million \$2019)							
Monetary damages from air pollution -		68.6	55.7	36.5	19.7	8.96	3.6
Fuel Comb - Residential - Natural Gas							
(million \$2019)							
Monetary damages from air pollution -		1.1	0.916	0.641	0.381	0.173	0.066
Fuel Comb - Residential - Oil (million							
\$2019]							
Monetary damages from air pollution -		12.6	11.5	8 77	5.68	2 84	116
Fuel Comb - Residential - Other (million		12.0	1110	0.11	0.00	2.01	me
\$2019)							
Monetary demages from air pollution	-	6 20	6.00	<b>۲ 01</b>	۲ ۲	<b>۲</b> 0	/. 00
Fuel Comb - Comm/Institutional - Coal		0.32	0.00	5.01	0.01	5.2	4.00
(million \$2010)							
Monotony domagos from air pollution		1.4.1	20 E	00.0	10.0	10.7	E 0.2
Fuel Comb. Comm/Institutional Natural		40.1	37.0	20.0	10.3	10.7	0.93
ruer Comp - 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 -		6.8	5.54	4.39	3.31	2.36	1.53
Fuel Comb - Comm/Institutional - Oil							
(million \$2019)							
Monetary damages from air pollution -		3.78	3.18	2.6	2.04	1.5	0.988
Fuel Comb - Comm/Institutional - Other							
(million \$2019)							
Monetary damages from air pollution -		9.21	3.36	3.28	3.17	3.14	3.08
Industrial Processes - Coal Mining							
(million \$2019)							
Monetary damages from air pollution -		752	717	664	520	392	247
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)		859	862	1,795	1,224	1,152	942
By economic sector - Construction (jobs)		8,809	13,744	17,724	21,027	24,936	29,970
By economic sector - Manufacturing		5,555	6,225	7,477	6,970	6,529	7,031
(jobs)							
By economic sector - Mining (jobs)		5,896	4,715	3,680	2,449	1,671	1,018
By economic sector - Other (jobs)		734	1,105	1,700	2,342	3,014	4,073
By economic sector - Pipeline (jobs)		462	898	638	333	282	285
By economic sector - Professional (jobs)		6,054	8,646	13,150	16,448	20,535	25,118
By economic sector - Trade (jobs)		4,533	5,581	7,322	8,943	10,973	13,748
By economic sector - Utilities (jobs)		6,227	10,323	13,023	15,246	19,023	23,139
By resource sector - Biomass (jobs)		2,016	1,965	4,598	3,381	4,241	4,165
By resource sector - CO2 (jobs)		40.2	4,051	2,478	673	946	1,523
By resource sector - Coal (jobs)		375	0	0	0	0	0
By resource sector - Grid (jobs)		7,620	12,322	19,346	25,789	33,023	40,896
By resource sector - Natural Gas (jobs)		4,634	3,727	3,007	2,479	1,988	1,344
By resource sector - Nuclear (jobs)		640	630	365	0.013	0.015	0.026
By resource sector - Oil (jobs)		11,916	10,519	9,106	6,609	4,912	3,139
By resource sector - Solar (jobs)		2,311	2,491	3,485	4,318	4,959	7,431
By resource sector - Wind (jobs)		9,577	16,395	24,126	31,733	38,045	46,826
By education level - All sectors - High		16,117	21,486	27,414	30,340	35,260	41,846
school diploma or less (jobs)							
By education level - All sectors -		11,587	16,013	20,445	23,476	27,829	33,558
Associates degree or some college (jobs)							
By education level - All sectors -		8,879	11,313	14,337	16,181	19,059	22,745
Bachelors degree (jobs)							
By education level - All sectors - Masters		2,206	2,846	3,709	4,270	5,102	6,131
or professional degree (jobs)							
By education level - All sectors - Doctoral		340	442	605	715	866	1,044
degree (jobs)							
Related work experience - All sectors -		5,526	7,432	9,502	10,672	12,550	15,014
None (jobs)							
Related work experience - All sectors - Up		7,805	10,325	13,357	14,867	17,324	20,646
to 1 year (jobs)							
Related work experience - All sectors - 1		14,215	18,837	24,017	27,129	31,937	38,154
to 4 years (jobs)							
Related work experience - All sectors - 4		9,113	12,263	15,564	17,728	20,937	25,101
to 10 years (jobs)							
Related work experience - All sectors -		2,470	3,243	4,070	4,585	5,366	6,409
Over 10 years (jobs)							
On-the-Job Training - All sectors - None		2,206	2,859	3,636	4,099	4,817	5,771
(jobs)							
On-the-Job Training - All sectors - Up to 1		26,267	34,373	44,017	49,228	57,630	68,671
year (jobs)							

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

These	0000	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		7,880	10,866	13,758	15,731	18,600	22,349
years (jobs)							
On-the-Job Training - All sectors - 4 to 10		2,396	3,499	4,476	5,230	6,269	7,585
years (jobs)							
On-the-Job Training - All sectors - Over 10		379	503	623	694	798	948
years (jobs)							
On-Site or In-Plant Training - All sectors -		6,376	8,472	10,923	12,368	14,572	17,445
None (jobs)							
On-Site or In-Plant Training - All sectors -		23,747	31,145	39,767	44,510	52,116	62,137
Up to 1 year (jobs)							
On-Site or In-Plant Training - All sectors -		6,156	8,418	10,657	12,129	14,303	17,155
1 to 4 years (jobs)							
On-Site or In-Plant Training - All sectors -		2,539	3,621	4,593	5,316	6,340	7,639
4 to 10 years (jobs)							
On-Site or In-Plant Training - All sectors -		311	445	571	659	784	947
Over 10 years (jobs)							
Wage income - All (million \$2019)		2,053	2,755	3,545	4,046	4,824	5,833

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

Item	2020	2025	2030	2035	2040	2045	2050
Oil consumption - Annual (million bbls)		82.3	73.3	59.2	45.7	35.1	26.3
Oil consumption - Cumulative (million							1,813
bbls)							
Oil production - Annual (million bbls)		45	45.1	45.1	35.7	29	19.3
Natural gas consumption - Annual (tcf)		240	202	162	122	76.7	53.2
Natural gas consumption - Cumulative							4,880
(tcf)							
Natural gas production - Annual (tcf)		223	211	184	155	123	95.6

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

Item	2020	2025	2030	2035	2040	2045	2050				
Final energy use - Transportation (PJ)	286	268	235	195	160	139	131				
Final energy use - Residential (PJ)	120	113	102	86.8	74.3	66.4	62.6				
Final energy use - Commercial (PJ)	110	107	101	92.6	85.5	81	78.6				
Final energy use - Industry (PJ)	174	182	189	190	195	204	206				

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

Item	2020	2025	2030	2035	2040	2045	2050
Electricity distribution capital invested -		1.98	2.05	3.35	3.56	3.35	3.52
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)	13.8	233	452	1,220	1,987	2,600	3,213
Vehicle stocks - LDV – All others (1000	2,679	2,551	2,423	1,766	1,109	627	146
units)							
Light-duty vehicle capital costs vs. REF -		515	1,320	2,139	3,240	3,527	3,363
Cumulative 5-yr (million \$2018)							
Public EV charging plugs - DC Fast (1000	0.119		0.964		4.24		6.85
units)							
Public EV charging plugs - L2 (1000 units)	0.786		23.3		102		165

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

Item	2020	2025	2030	2035	2040	2045	2050
Sales of space heating units - Electric	4.79	20.7	76.2	90.8	91.9	91.9	91.7
Heat Pump (%)							
Sales of space heating units - Electric	11.9	15	6.62	4.42	4.27	4.39	4.55
Resistance (%)							
Sales of space heating units - Gas (%)	77.4	55.1	13.1	2.17	1.44	1.41	1.38
Sales of space heating units - Fossil (%)	5.87	9.2	4.05	2.66	2.42	2.31	2.37
Sales of water heating units - Electric	0	9.31	49.7	59.7	60.3	60.3	60.3
Heat Pump (%)							
Sales of water heating units - Electric	27.3	41.9	39.5	39.6	39.7	39.7	39.7
Resistance (%)							
Sales of water heating units - Gas Furnace	72.7	48.8	10.7	0.692	0.019	0	0
(%)							
Sales of water heating units - Other (%)	0.024	0.027	0.027	0.027	0.027	0.027	0.027
Sales of cooking units - Electric	66.4	73.6	95.5	99.8	100	100	100
Resistance (%)							
Sales of cooking units - Gas (%)	33.6	26.4	4.52	0.228	0	0	0
Residential HVAC investment in 2020s vs.		3.01	4.04				
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	2.13	24.7	71.3	88	89.8	89.9	89.8
Heat Pump (%)							
Sales of space heating units - Electric	4.54	5.67	7.02	9.23	9.68	9.7	9.71
Resistance (%)							
Sales of space heating units - Gas Furnace	93.3	67.9	21.4	2.81	0.539	0.45	0.45
(%)							
Sales of space heating units - Fossil (%)	0	1.73	0.333	0.014	0	0	0
Sales of water heating units - Electric	0.677	10.7	53.8	64.7	65.3	65.3	65.3
Heat Pump (%)							
Sales of water heating units - Electric	5.85	10.9	28.5	33.6	34	34	34
Resistance (%)							
Sales of water heating units - Gas Furnace	92.9	77.4	17	1.1	0.03	0	0
(%)							
Sales of water heating units - Other (%)	0.567	0.935	0.728	0.68	0.677	0.679	0.679
Sales of cooking units - Electric	44.8	57.1	84	89.3	89.6	89.6	89.6
Resistance (%)							
Sales of cooking units - Gas (%)	55.2	42.9	16	10.7	10.4	10.4	10.4
Commercial HVAC investment in 2020s -		8,255	8,955				
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)	2,770	0	0	0	0	0	0
Installed thermal - Natural gas (MW)	3,646	2,546	3,789	4,389	4,692	5,516	5,241
Installed thermal - Nuclear (MW)	1,268	1,268	1,268	0	0.006	0.011	0.02
Installed renewables - Rooftop PV (MW)	318	560	817	1,203	1,752	2,467	3,398
Installed renewables - Solar - Base land	22.2	22.2	22.2	22.2	22.2	22.2	99.9
use assumptions (MW)							
Installed renewables - Wind - Base land	7,584	7,584	7,907	9,178	11,486	14,792	14,988
use assumptions (MW)							
Installed renewables - Solar -	17.1	17.1	17.1	227	227	227	227
Constrained land use assumptions (MW)							
Installed renewables - Wind - Constrained	7,584	7,584	8,075	9,870	14,212	19,327	19,693
land use assumptions (MW)							
Capital invested - Solar PV - Base (billion		0	0	0	0	0	0.072
\$2018)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Capital invested - Wind - Base (billion		0	0.43	1.58	2.73	3.71	0.208
\$2018)							
Capital invested - Solar PV - Constrained		0.03	0	0.231	0	0	0.072
(billion \$2018)							
Capital invested - Wind - Constrained		0.552	0.572	3.14	5.93	6.23	0.442
(billion \$2018)							
Capital invested - Biomass power plant	0	0	0	0	0	0	0
(billion \$2018)							
Capital invested - Biomass w/ccu allam	0	0	0	0	0	0	0.042
power plant (billion \$2018)							
Capital invested - Biomass w/ccu power	0	0	0	0	0	0	0.171
plant (billion \$2018)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Solar - Base land use assumptions (GWh)	58.5	58.5	58.5	58.5	58.5	58.5	209
Wind - Base land use assumptions (GWh)	31,394	31,394	32,596	37,276	45,638	57,527	58,220
OffshoreWind - Base land use	0	0	0	0	0	0	0
assumptions (GWh)							
Solar - Constrained land use assumptions	45.5	45.5	45.5	450	450	450	450
(GWh)							
Wind - Constrained land use assumptions	31,394	31,394	33,202	39,664	55,059	72,775	74,048
(GWh)							
OffshoreWind - Constrained land use	0	0	0	0	0	0	0
assumptions (GWh)							
Biomass power plant (GWh)	0	0	0	0	0	0	0
Biomass w/ccu power plant (GWh)	0	0	0	0	0	0	192
Biomass w/ccu allam power plant (GWh)	0	0	0	0	0	0	41.8

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

		0,					
Item	2020	2025	2030	2035	2040	2045	2050
Number of facilities - Power (quantity)	0	0	0	0	0	0	0
Number of facilities - Power ccu	0	0	0	0	0	0	1
(quantity)							
Number of facilities - Allam power w ccu	0	0	0	0	0	0	1
(quantity)							
Number of facilities - Beccs hydrogen	0	0	0	6	6	11	13
(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	1
Number of facilities - Pyrolysis (quantity)	0	0	0	0	0	0	0
Number of facilities - Pyrolysis ccu	0	0	0	0	0	0	1
(quantity)							
Number of facilities - Sng (quantity)	0	0	0	0	0	0	0
Number of facilities - Sng ccu (quantity)	0	0	0	0	0	0	0
Conversion capital investment -		0	0	6,624	0	5,640	2,843
Cumulative 5-yr (million \$2018)							
Biomass purchases (million \$2018/y)		0	0	461	461	853	1,051

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

Item	2020	2025	2030	2035	2040	2045	2050
Annual - All (MMT)		0	0.01	8.54	11.9	19.2	23
Annual - BECCS (MMT)		0	0	8.51	8.51	15.8	19.4
Annual - NGCC (MMT)		0	0.01	0.03	0.02	0.02	0.02
Annual - Cement and lime (MMT)		0	0	0	3.32	3.42	3.53
Cumulative - All (MMT)		0	0.01	8.55	20.4	39.6	62.6
Cumulative - BECCS (MMT)		0	0	8.51	17	32.8	52.2

## Table 12: E+ scenario - PILLAR 4: CCUS - CO2 capture (continued)

Item	2020	2025	2030	2035	2040	2045	2050
Cumulative - NGCC (MMT)		0	0.01	0.04	0.06	0.08	0.1
Cumulative - Cement and lime (MMT)		0	0	0	3.32	6.74	10.3

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

Item	2020	2025	2030	2035	2040	2045	2050
Trunk (km)		0	997	1,361	1,361	1,361	1,361
Spur (km)		0	58.5	659	926	1,283	1,902
All (km)		0	1,055	2,020	2,287	2,644	3,263
Cumulative investment - Trunk (million \$2018)		0	4,953	6,879	6,879	6,879	6,879
Cumulative investment - Spur (million \$2018)		0	30.9	494	715	971	1,456
Cumulative investment - All (million \$2018)		0	4,984	7,372	7,594	7,850	8,335

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

Item	2020	2025	2030	2035	2040	2045	2050
Annual (MMT)		0	0	1.76	2.71	4.3	5.59
Injection wells (wells)		0	1	3	6	10	12
Resource characterization, appraisal, permitting costs (million \$2020)		77.2	185	216	216	216	216
Wells and facilities construction costs (million \$2020)		0	25.7	100	178	298	371

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Low - Accelerate							-74.7
regeneration (1000 tCO2e/y)							
Carbon sink potential - Low - Avoid							-283
deforestation (1000 tCO2e/y)							
Carbon sink potential - Low - Extend							-378
rotation length (1000 tCO2e/y)							
Carbon sink potential - Low - Improve							-22.8
plantations (1000 tCO2e/y)							
Carbon sink potential - Low - Increase							-179
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - Low - Increase							-1,263
trees outside forests (1000 tCO2e/y)							
Carbon sink potential - Low - Reforest							-13,386
cropland (1000 tCO2e/y)							
Carbon sink potential - Low - Reforest							-503
pasture (1000 tCO2e/y)							
Carbon sink potential - Low - Restore							-227
productivity (1000 tCO2e/y)							
Carbon sink potential - Low - All (not							-16,316
counting overlap) (1000 tCO2e/y)							
Carbon sink potential - Mid - Accelerate							-112
regeneration (1000 tCO2e/y)							
Carbon sink potential - Mid - Avoid							-992
deforestation (1000 tCO2e/y)							
Carbon sink potential - Mid - Extend							-680
rotation length (1000 tCO2e/y)							
Carbon sink potential - Mid - Improve							-33.4
plantations (1000 tCO2e/y)							
Carbon sink potential - Mid - Increase							-357
retention of HWP (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 - Increase							-2,435
trees outside forests (1000 tC02e/v)							_,
Carbon sink notential - Mid - Peforest							_20 079
compland (1000 tC020/y)							-20,019
Contracting (1000 (002277))							0.575
Carbon sink polentiai - Miu - Reforest							-3,575
pasture (1000 tG02e/y)							
Carbon sink potential - Mid - Restore							-451
productivity (1000 tCO2e/y)							
Carbon sink potential - Mid - All (not							-28,714
counting overlap) (1000 tCO2e/y)							
Carbon sink potential - High - Accelerate							-149
regeneration (1000 tCO2e/v)							
Carbon sink notential - High - Avoid							_1700
defensetation (1000 tC020/y)							-1,100
Carbon sink potential - Hign - Extend							-983
rotation length (1000 tC02e/y)							
Carbon sink potential - High - Improve							-44.9
plantations (1000 tCO2e/y)							
Carbon sink potential - High - Increase							-536
retention of HWP (1000 tCO2e/y)							
Carbon sink notential - High - Increase							-3.607
trees outside forests (1000 tC02e/v)							0,00
Carbon sink notantial High Defenset							96 779
Carbon Sink potential - High - Reforest							-20,112
Carbon sink potential - High - Reforest							-6,646
pasture (1000 tCO2e/y)							
Carbon sink potential - High - All (not							-41,112
counting overlap) (1000 tCO2e/y)							
Carbon sink potential - High - Restore							-674
productivity (1000 tC02e/y)							
Land impacted for carbon sink notential -							12.2
Low - Accelerate regeneration (1000							
hectores)							
Lond imposted for carbon sink notantial							01/
							210
Low - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							192
Low - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							8.26
Low - Improve plantations (1000							
hectares)							
Land impacted for carbon sink notential							0
Land Impacted for car borraink potential -							0
Land impacted for carbon sink potential -							180
Low - Increase trees outside forests							
(1000 hectares)							
Land impacted for carbon sink potential -							885
Low - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							32.7
Low - Reforest pasture (1000 bectares)							-
Land impacted for carbon sink notential							125
$L_{\rm ow}$ = Dectors productivity (1000							100
$r_{000} = r_{000}$							
							4.4.6
Land impacted for carbon sink potential -							1,662
Low - Total impacted (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							18.3
Mid - Accelerate regeneration (1000							
hectares)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Land impacted for carbon sink potential -							223
Mid - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							347
Mid - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							12.4
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 -							262
Mid - Increase trees outside forests (1000							
hectares)							
Land impacted for carbon sink potential -							1,328
Mid - Reforest cropland (1000 hectares)							·
Land impacted for carbon sink potential -							237
Mid - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							272
Mid - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							2,699
Mid - Total impacted (over 30 years) (1000							
hectares)							
Land impacted for carbon sink potential -							24.4
High - Accelerate regeneration (1000							
hectares)							
Land impacted for carbon sink potential -							230
High - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							501
High - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							16.5
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 -							343
High - Increase trees outside forests							
(1000 hectares)							
Land impacted for carbon sink potential -							1,770
High - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							189
High - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							223
High - Restore productivity (1000							
hectares)						_	
Land impacted for carbon sink potential -							3,297
High - Total impacted (over 30 years)							
(1000 hectares)							

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

	•						
Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Moderate							-696
deployment - Corn-ethanol to energy							
grasses (1000 tCO2e/y)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Moderate							-5.387
deployment - Cropland measures (1000							
tCO2e/v)							
Carbon sink potential - Moderate							-312
deployment - Permanent conservation							
cover (1000 tCO2e/y)							
Carbon sink potential - Moderate							-6,395
deployment - Total (1000 tCO2e/y)							
Carbon sink potential - Aggressive							-696
deployment - Corn-ethanol to energy							
grasses (1000 tCO2e/y)							
Carbon sink potential - Aggressive							-10,263
deployment - Cropland measures (1000							
tCO2e/y)							
Carbon sink potential - Aggressive							-624
deployment - Permanent conservation							
cover (1000 tCO2e/y)							
Carbon sink potential - Aggressive							-11,583
deployment - Total (1000 tCO2e/y)							
Land impacted for carbon sink - Moderate							413
deployment - Corn-ethanol to energy							
grasses (1000 hectares)							
Land impacted for carbon sink - Moderate							5,430
deployment - Cropland measures (1000							
hectares)							
Land impacted for carbon sink - Moderate							524
deployment - Permanent conservation							
cover (1000 hectares)							
Land impacted for carbon sink - Moderate							6,366
deployment - Total (1000 hectares)							
Land impacted for carbon sink -							413
Aggressive deployment - Corn-ethanol to							
energy grasses (1000 hectares)							
Land impacted for carbon sink -							10,336
Aggressive deployment - Cropland							
measures (1000 hectares)							
Land impacted for carbon sink -							1,047
Aggressive deployment - Permanent							
conservation cover (1000 hectares)							
Land impacted for carbon sink -							11,796
Aggressive deployment - Total (1000							
hectaresJ							

## Table 17: E- scenario - IMPACTS - Health

Item	2020	2025	2030	2035	2040	2045	2050
Premature deaths from air pollution -		22.2	0.022	0.021	0.018	0.011	0
Fuel Comb - Electric Generation - Coal							
(deaths)							
Premature deaths from air pollution -		13.8	5.77	2.87	1.52	0.604	0.459
Fuel Comb - Electric Generation - Natural							
Gas (deaths)							
Premature deaths from air pollution -		46.6	47.1	46.1	41.7	33.4	23
Mobile - On-Road (deaths)							
Premature deaths from air pollution - Gas		4.97	5.03	4.87	4.4	3.52	2.47
Stations (deaths)							
Premature deaths from air pollution -		7.83	7.2	6.42	5.28	3.87	2.51
Fuel Comb - Residential - Natural Gas							
(deaths)							
Premature deaths from air pollution -		0.127	0.123	0.119	0.108	0.088	0.068
Fuel Comb - Residential - Oil (deaths)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Premature deaths from air pollution -	2020	144	148	148	136	1.08	0.755
Fuel Comb - Residential - Other (deaths)		1.44	1.40	1.40	1.00	1.00	0.100
Dremature deaths from air pollution -		0.71/	0.687	0 656	0 623	0 5 8 8	0 551
Fuel Comb. Comm/Institutional. Coal		0.114	0.001	0.000	0.023	0.000	0.551
(deetbe)							
Uted (IIS)		F 0/	F 00	/ /0	( 00	2.00	0.40
Fremature deaths from air poliution -		5.24	5.03	4.69	4.09	3.28	2.43
Fuel Comb - Comm/Institutional - Natural							
Gas (deaths)				0.70/	10		
Premature deaths from air pollution -		0.768	0.676	0.594	0.513	0.434	0.361
Fuel Comb - Comm/Institutional - Oil							
(deaths)							
Premature deaths from air pollution -		0.427	0.386	0.345	0.305	0.265	0.227
Fuel Comb - Comm/Institutional - Other							
(deaths)							
Premature deaths from air pollution -		1	0.383	0.377	0.37	0.357	0.329
Industrial Processes - Coal Mining							
(deaths)							
Premature deaths from air pollution -		84.6	78.2	69.7	62.4	56	39.1
Industrial Processes - Oil & Gas							
Production (deaths)							
Monetary damages from air pollution -		197	0 195	0 187	0 156	0 102	0.002
Fuel Comb - Electric Generation - Coal		171	0.170	0.101	0.100	0.102	0.002
(million \$2019)							
Monotany damages from air pollution		100	511	25 /	12 5	5.25	/. 04
Fuel Comp. Electric Concretion Netural		122	51.1	25.4	13.5	0.00	4.00
Coo (million #2010)							
			(10	(10	071	007	
Monetary damages from air pollution -		414	419	410	371	297	205
Mobile - Un-Road (million \$2019)							
Monetary damages from air pollution -		44	44.5	43.2	38.9	31.2	21.9
Gas Stations (million \$2019)							
Monetary damages from air pollution -		69.4	63.8	56.9	46.8	34.3	22.2
Fuel Comb - Residential - Natural Gas							
(million \$2019)							
Monetary damages from air pollution -		1.12	1.09	1.05	0.956	0.782	0.599
Fuel Comb - Residential - Oil (million							
\$2019)							
Monetary damages from air pollution -		12.8	13.1	13.1	12.1	9.55	6.69
Fuel Comb - Residential - Other (million							
\$2019]							
Monetary damages from air pollution -		6.32	6.08	5.81	5.51	5.2	4.88
Fuel Comb - Comm/Institutional - Coal							
(million \$2019)							
Monetary damages from air pollution -		464	44.5	415	36.2	29	21.5
Fuel Comb - Comm/Institutional - Natural		40.4	44.0	41.5	50.2	27	21.5
Cas (million \$2019)							
Monotany damages from air pollution		6.0	5.00	E 94	/. 5/.	2 0/.	20
Fuel Comp. Comm/Institutional Oil		0.0	J.77	5.20	4.54	5.04	3.2
Fuel Comp - Comm/mstitutional - On							
		0.70	0./1	0.05	0.7	0.05	0.01
Monetary damages from air pollution -		3.78	3.41	3.05	2.7	2.35	2.01
Monetary damages from air pollution -		8.84	3.38	3.33	3.26	3.15	2.9
Industrial Processes - Coal Mining							
(million \$2019)							
Monetary damages from air pollution -		751	694	619	554	498	347
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)		860	861	2,628	1,855	1,592	942
By economic sector - Construction (jobs)		8,880	14,916	18,146	21,085	27,781	35,692
By economic sector - Manufacturing		5,631	6,295	7,544	7,713	8.559	9,010
(iobs)		-,	-, -	, -	, -		,
By economic sector - Mining (jobs)		5.905	4,725	3.772	2.998	2.394	1.531
By economic sector - Other (jobs)		741	1116	1678	2 317	3 261	4 689
By economic sector - Pineline (inhs)		463	1 240	847	422	422	460
By economic sector - Professional (jobs)		6 123	8 771	1/, 056	17 692	23 585	29 877
By economic sector - Trade (jobs)		/, 570	5 66/	7606	9 / 96	12 55/	16 / 65
By economic sector - If add (Jobs)		4,010	11 220	12 001	1/, 012	01 170	07 5 07
By economic sector - Otimites (JOBS)		0,100	10/1	7 010	14,013	21,17	21,001
By resource sector - Biolilass (JODS)		2,017	1,901	(,010	0,903	0,111	4,028
By resource sector - CO2 (Jobs)		40.4	6,916	4,256	1,175	1,623	2,585
By resource sector - Coal (Jobs)		375	0	U 10.001	0	0	<u> </u>
By resource sector - Grid (jobs)		7,489	11,866	18,391	24,870	36,499	48,137
By resource sector - Natural Gas (jobs)		4,639	3,269	2,442	1,906	2,027	1,591
By resource sector - Nuclear (jobs)		640	630	365	0.015	0.017	0.03
By resource sector - Oil (jobs)		11,952	10,712	9,618	8,447	7,255	4,769
By resource sector - Solar (jobs)		2,341	2,525	3,293	4,172	5,095	7,470
By resource sector - Wind (jobs)		9,865	17,040	23,324	30,857	42,047	57,673
By education level - All sectors - High		16,206	22,720	28,904	31,842	40,638	50,073
school diploma or less (jobs)							
By education level - All sectors -		11,656	16,999	21,112	24,148	31,743	40,244
Associates degree or some college (jobs)							
By education level - All sectors -		8,934	11,793	14,966	17,114	22,061	27,342
Bachelors degree (jobs)		-, -	, -	,		,	,-
By education level - All sectors - Masters		2.220	2.952	3.884	4.518	5.881	7.347
or professional degree (jobs)		_,	_,		.,	-,	.,
By education level - All sectors - Doctoral		343	453	642	768	1000	1 947
degree (inhs)		0.10	100	0.2	100	1,000	.,
Related work experience - All sectors -		5 5 5 6	7865	9984	11 165	14 426	17971
None (jobs)		0,000	1,000	7,704	11,100	17,720	11,211
Related work experience All sectors Up		795/	10.950	1/. 120	15 702	20.002	2/. 661
to 1 year (jobs)		1,054	10,650	14,120	13,102	20,002	24,001
Deleted work experience. All costons. 1		1/, 207	10.02/	25.042	00.251	26 700	/ 5 770
te ( veene (iebe)		14,297	19,834	25,063	26,351	30,722	45,772
		01/7	10.050	1( 100	10 / 00	00.007	0.0 10.0
Related Work experience - All sectors - 4		9,167	12,958	16,138	18,402	23,997	30,138
to IU years (Jobs)		0 ( 0 5		( 000	( 774	( 170	
Related work experience - All sectors -		2,485	3,409	4,203	4,771	6,179	7,711
Uver 10 years (jobs)							
On-the-Job Training - All sectors - None		2,220	2,994	3,813	4,329	5,557	6,906
(jobs)							
On-the-Job Training - All sectors - Up to 1		26,423	36,072	46,247	51,890	66,589	82,310
year (jobs)							
On-the-Job Training - All sectors - 1 to 4		7,925	11,555	14,191	16,146	21,192	26,820
years (jobs)							
On-the-Job Training - All sectors - 4 to 10		2,409	3,762	4,613	5,307	7,069	9,076
years (jobs)							
On-the-Job Training - All sectors - Over 10		382	533	643	719	917	1,141
years (jobs)							
On-Site or In-Plant Training - All sectors -		6,419	8,913	11,448	12,969	16,758	20,898
None (jobs)							
On-Site or In-Plant Training - All sectors -		23.885	32,713	41,709	46.825	60.163	74.483
Up to 1 year (jobs)		-,	-,-	, -	-,	,	,
On-Site or In-Plant Training - All sectors -		6 191	8 936	11 017	12 492	16,330	20 584
1 to 4 years (jobs)		0,171	0,700	,	12, 172	10,000	20,004
On-Site or In-Plant Training - All sectors -		2 552	3 880	4743	5 429	7181	9153
4  to  10  years (iobs)		2,002	5,000	4,140	0,427	1,101	2,100
On-Site or In-Plant Training - All sectors -		210	1.76	500	675	<u></u> 207	1125
Over 10 years (inhs)		512	410	570	013	072	1,100
Wage income - All (million #2010)		0 0 / E	2002	2 701	1. 000	5510	4 000
waye income - An (million \$2019)		2,065	2,902	3,701	4,230	5,548	0,777

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

Item	2020	2025	2030	2035	2040	2045	2050
Final energy use - Transportation (PJ)	287	270	245	226	212	195	175
Final energy use - Residential (PJ)	120	114	109	103	93.6	83.1	73.8
Final energy use - Commercial (PJ)	110	107	104	99.9	95.2	90.4	86.3
Final energy use - Industry (PJ)	174	182	190	193	200	209	211

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

These	0000	0005	,	0005	00/0	00/5	0050
Item	2020	2025	2030	2035	2040	2045	2050
Electricity distribution capital invested -		1.64	1.66	2.05	2.12	3.02	3.19
Cumulative 5-yr (billion \$2018)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Vehicle stocks - LDV – EV (1000 units)	10.7	75.1	140	438	737	1,397	2,058
Vehicle stocks - LDV – All others (1000	2,690	2,690	2,690	2,552	2,413	1,860	1,306
units)							
Light-duty vehicle capital costs vs. REF -		0	83.3	175	591	1,861	2,710
Cumulative 5-yr (million \$2018)							
Public EV charging plugs - DC Fast (1000	0.119		0.298		1.57		4.39
units)							
Public EV charging plugs - L2 (1000 units)	0.786		7.18		37.9		106

Table 22: E segnario		Efficiency/Electri	figation Posidontial
Table ZZ. E- Scenurio -	PILLAR I.	EIIICIEIICY/EIECUII	Culion - Residential

Item	2020	2025	2030	2035	2040	2045	2050
Sales of space heating units - Electric	4.79	10.1	16.5	34.7	63.2	82.5	89.3
Heat Pump (%)							
Sales of space heating units - Electric	11.9	16.6	15.6	12.9	8.54	5.65	4.74
Resistance (%)							
Sales of space heating units - Gas (%)	77.4	63	58.2	44.5	23.1	8.65	3.34
Sales of space heating units - Fossil (%)	5.87	10.2	9.69	7.94	5.1	3.2	2.63
Sales of water heating units - Electric	0	1.62	6.21	19.5	40	53.6	58.5
Heat Pump (%)							
Sales of water heating units - Electric	27.3	42.3	42	41.2	40.3	39.8	39.7
Resistance (%)							
Sales of water heating units - Gas Furnace	72.7	56	51.8	39.3	19.8	6.56	1.76
(%)							
Sales of water heating units - Other (%)	0.024	0.027	0.027	0.027	0.027	0.027	0.027
Sales of cooking units - Electric	66.3	67.2	70.2	78.4	89.7	96.7	99.1
Resistance (%)							
Sales of cooking units - Gas (%)	33.7	32.8	29.8	21.6	10.3	3.33	0.895
Residential HVAC investment in 2020s vs.		2.99	4.02				
REF - Cumulative 5-yr (billion \$2018)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Sales of space heating units - Electric	2.13	16	21.4	36.9	61.7	79.8	87
Heat Pump (%)							
Sales of space heating units - Electric	4.54	5.5	5.66	6.18	7.29	8.59	9.36
Resistance (%)							
Sales of space heating units - Gas Furnace	93.3	76.5	71.1	55.5	30.3	11.4	3.55
(%)							
Sales of space heating units - Fossil (%)	0	2	1.88	1.4	0.684	0.222	0.059
Sales of water heating units - Electric	0.677	2.54	7.44	21.6	43.5	58.2	63.4
Heat Pump (%)							
Sales of water heating units - Electric	5.85	7.67	9.68	15.4	24.5	30.8	33.1
Resistance (%)							

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

Item	2020	2025	2030	2035	2040	2045	2050		
Sales of water heating units - Gas Furnace	92.9	88.8	81.9	62.1	31.2	10.4	2.79		
(%)									
Sales of water heating units - Other (%)	0.567	0.974	0.953	0.882	0.777	0.711	0.687		
Sales of cooking units - Electric	44.8	49.3	53.1	63	76.9	85.5	88.5		
Resistance (%)									
Sales of cooking units - Gas (%)	55.2	50.7	46.9	37	23.1	14.5	11.5		
Commercial HVAC investment in 2020s -		8,253	8,961						
Cumulative 5-yr (million \$2018)									

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

	,	0	, ,				
Item	2020	2025	2030	2035	2040	2045	2050
Installed thermal - Coal (MW)	2,770	0	0	0	0	0	0
Installed thermal - Natural gas (MW)	3,652	2,606	2,610	2,425	2,162	4,286	4,865
Installed thermal - Nuclear (MW)	1,268	1,268	1,268	0	0.007	0.013	0.023

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Low - Accelerate							-74.7
regeneration (1000 tCO2e/y)							
Carbon sink potential - Low - Avoid							-283
deforestation (1000 tCO2e/y)							
Carbon sink potential - Low - Extend							-378
rotation length (1000 tCO2e/y)							
Carbon sink potential - Low - Improve							-22.8
plantations (1000 tCO2e/y)							
Carbon sink potential - Low - Increase							-179
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - Low - Increase							-1,263
trees outside forests (1000 tCO2e/y)							
Carbon sink potential - Low - Reforest							-13,386
cropland (1000 tCO2e/y)							
Carbon sink potential - Low - Reforest							-503
pasture (1000 tCO2e/y)							
Carbon sink potential - Low - Restore							-227
productivity (1000 tCO2e/y)							
Carbon sink potential - Low - All (not							-16,316
counting overlap) (1000 tCO2e/y)							
Carbon sink potential - Mid - Accelerate							-112
regeneration (1000 tCO2e/y)							
Carbon sink potential - Mid - Avoid							-992
deforestation (1000 tCO2e/y)							
Carbon sink potential - Mid - Extend							-680
rotation length (1000 tCO2e/y)							
Carbon sink potential - Mid - Improve							-33.4
plantations (1000 tCO2e/y)							
Carbon sink potential - Mid - Increase							-357
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - Mid - Increase							-2,435
trees outside forests (1000 tCO2e/y)							
Carbon sink potential - Mid - Reforest							-20,079
cropland (1000 tCO2e/y)							
Carbon sink potential - Mid - Reforest							-3,575
pasture (1000 tC02e/y)							
Carbon sink potential - Mid - Restore							-451
productivity (1000 tCO2e/y)							
Carbon sink potential - Mid - All (not							-28,714
counting overlap] (1000 tCO2e/y)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink notential - High - Accelerate							-149
regeneration (1000 tC02e/v)							
Carbon sink notential - High - Avoid							_1700
deforestation (1000 tC02e/v)							-1,100
Carbon sink potential High Extend							002
rotation longth (1000 t0020/y)							-703
Carbon Sink potential - Hign - Improve							-44.9
plantations (1000 tC02e/y)							
Carbon sink potential - High - Increase							-536
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - High - Increase							-3,607
trees outside forests (1000 tCO2e/y)							
Carbon sink potential - High - Reforest							-26,772
cropland (1000 tCO2e/y)							
Carbon sink potential - High - Reforest							-6.646
nasture (1000 tC02e/v)							-,
Carbon sink notential - High - All (not							-41 112
counting overlap) (1000 tC02e/v)							41,112
Conhan sink notantial Uigh Destana							/7/
Carbon Sink potential - High - Restore							-074
Land impacted for carbon sink potential -							12.2
Low - Accelerate regeneration (1000							
hectares)							
Land impacted for carbon sink potential -							216
Low - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							192
Low - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink notential -							8.26
Land Impacted for carbon sink potential -							0.20
hostorea)							
Lond imported for earbon sink notantial							0
Land impacted for carbon sink potential -							U
Low - Increase retention of HWP (1000							
hectaresj							
Land impacted for carbon sink potential -							180
Low - Increase trees outside forests							
(1000 hectares)							
Land impacted for carbon sink potential -							885
Low - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							32.7
Low - Reforest pasture (1000 hectares)							
Land impacted for carbon sink notential -							135
Low - Restore productivity (1000							100
hartares)							
Land impacted for carbon sink notantial							1 4 4 9
Low Total impacted (over 20 verse)							1,002
(1000 hastares)							
							10.0
Lanu impacteu for carbon Sink potential -							18.3
Milu - Accelerate regeneration (1000							
hectaresj							-
Land impacted for carbon sink potential -							223
Mid - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							347
Mid - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							12.4
Mid - Improve plantations (1000 hectares)							
	I						

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

Itom	2020	2025	2020	2025	207.0	2075	2050
Land impacted for carbon sink potential -	2020	2025	2030	2033	2040	2043	2030
Mid - Increase retention of HW/D (1000							0
hartares)							
Land impacted for carbon sink notential -							262
Mid - Increase trees outside forests (1000							202
hertares)							
Land impacted for carbon sink notential -							1 328
Mid - Reforest cronland (1000 hectares)							1,020
Land impacted for carbon sink notential -							237
Mid - Reforest pasture (1000 hectares)							201
Land impacted for carbon sink notential -							272
Mid - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							2,699
Mid - Total impacted (over 30 years) (1000							
hectares)							
Land impacted for carbon sink potential -							24.4
High - Accelerate regeneration (1000							
hectares)							
Land impacted for carbon sink potential -							230
High - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							501
High - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							16.5
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 -							343
High - Increase trees outside forests							
(1000 hectares)							
Land impacted for carbon sink potential -							1,770
High - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							189
High - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							223
High - Restore productivity (1000							
hectaresj							
Land impacted for carbon sink potential -							3,297
High - Total impacted (over 30 years)							
(1000 hectares)							

Table 26: E- scenario - PILLAR 6: Land sinks -	- Aariculture
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Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Moderate							-696
deployment - Corn-ethanol to energy							
grasses (1000 tCO2e/y)							
Carbon sink potential - Moderate							-5,387
deployment - Cropland measures (1000							
tCO2e/y)							
Carbon sink potential - Moderate							-312
deployment - Permanent conservation							
cover (1000 tCO2e/y)							
Carbon sink potential - Moderate							-6,395
deployment - Total (1000 tCO2e/y)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Aggressive							-696
deployment - Corn-ethanol to energy							
grasses (1000 tCO2e/y)							
Carbon sink potential - Aggressive							-10,263
deployment - Cropland measures (1000							
tCO2e/y)							
Carbon sink potential - Aggressive							-624
deployment - Permanent conservation							
cover (1000 tCO2e/y)							
Carbon sink potential - Aggressive							-11,583
deployment - Total (1000 tCO2e/y)							
Land impacted for carbon sink - Moderate							413
deployment - Corn-ethanol to energy							
grasses (1000 hectares)							
Land impacted for carbon sink - Moderate							5,430
deployment - Cropland measures (1000							
hectares)							
Land impacted for carbon sink - Moderate							524
deployment - Permanent conservation							
cover (1000 hectares)							
Land impacted for carbon sink - Moderate							6,366
deployment - Total (1000 hectares)							
Land impacted for carbon sink -							413
Aggressive deployment - Corn-ethanol to							
energy grasses (1000 hectares)							
Land impacted for carbon sink -							10,336
Aggressive deployment - Cropland							
measures (1000 hectares)							
Land impacted for carbon sink -							1,047
Aggressive deployment - Permanent							
conservation cover (1000 hectares)							
Land impacted for carbon sink -							11,796
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 -		22.2	0.022	0.021	0.018	0.011	0
Fuel Comb - Electric Generation - Coal							
(deaths)							
Premature deaths from air pollution -		13.1	6.36	2	1.38	0.639	0.405
Fuel Comb - Electric Generation - Natural							
Gas (deaths)							
Premature deaths from air pollution -		45.8	42.9	32.7	19	8.81	3.67
Mobile - On-Road (deaths)							
Premature deaths from air pollution - Gas		4.87	4.51	3.43	2.07	1.05	0.537
Stations (deaths)							
Premature deaths from air pollution -		7.75	6.28	4.12	2.22	1.01	0.406
Fuel Comb - Residential - Natural Gas							
(deaths)							
Premature deaths from air pollution -		0.124	0.103	0.072	0.043	0.02	0.007
Fuel Comb - Residential - Oil (deaths)							
Premature deaths from air pollution -		1.43	1.29	0.99	0.641	0.32	0.131
Fuel Comb - Residential - Other (deaths)							
Premature deaths from air pollution -		0.714	0.687	0.656	0.623	0.588	0.551
Fuel Comb - Comm/Institutional - Coal							
(deaths)							
Premature deaths from air pollution -		5.21	4.46	3.26	2.06	1.21	0.67
Fuel Comb - Comm/Institutional - Natural							
Gas (deaths)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Premature deaths from air pollution -		0.768	0.626	0.495	0.374	0.267	0.173
Fuel Comb - Comm/Institutional - Oil							
(deaths)							
Premature deaths from air pollution -		0.427	0.36	0.294	0.23	0.169	0.112
Fuel Comb - Comm/Institutional - Other							
(deaths)							
Premature deaths from air pollution -		1.15	0.381	0.371	0.358	0.354	0.303
Industrial Processes - Coal Mining							
(deaths)							
Premature deaths from air pollution -		83.5	79.8	70,4	51.2	32.1	5.22
Industrial Processes - Oil & Gas							
Production (deaths)							
Monetary damages from air pollution -		197	0.195	0.187	0.156	0.102	0.002
Fuel Comb - Electric Generation - Coal							
(million \$2019)							
Monetary damages from air pollution -		116	56.4	17.7	12.2	5.66	3.59
Fuel Comb - Electric Generation - Natural							
Gas (million \$2019)							
Monetary damages from air pollution -		408	381	291	169	78.3	32.6
Mobile - On-Road (million \$2019)							
Monetary damages from air pollution -		43.1	39.9	30.4	18.3	9.27	4.76
Gas Stations (million \$2019)							
Monetary damages from air pollution -		68.6	55.7	36.5	19.7	8.96	3.6
Fuel Comb - Residential - Natural Gas							
(million \$2019)							
Monetary damages from air pollution -		1.1	0.916	0.641	0.381	0.173	0.066
Fuel Comb - Residential - Oil (million							
\$2019)							
Monetary damages from air pollution -		12.6	11.5	8.77	5.68	2.84	1.16
Fuel Comb - Residential - Other (million							
\$2019)							
Monetary damages from air pollution -		6.32	6.08	5.81	5.51	5.2	4.88
Fuel Comb - Comm/Institutional - Coal							
(million \$2019)							
Monetary damages from air pollution -		46.1	39.5	28.8	18.3	10.7	5.93
Fuel Comb - Comm/Institutional - Natural							
Gas (million \$2019)							
Monetary damages from air pollution -		6.8	5.54	4.39	3.31	2.36	1.53
Fuel Comb - Comm/Institutional - Oil							
(million \$2019)							
Monetary damages from air pollution -		3.78	3.18	2.6	2.04	1.5	0.988
Fuel Comb - Comm/Institutional - Other							
(million \$2019)							
Monetary damages from air pollution -		10.2	3.37	3.27	3.16	3.13	2.67
Industrial Processes - Coal Mining							
(million \$2019)							
Monetary damages from air pollution -		742	708	625	454	285	46.3
Industrial Processes - Oil & Gas							
Production (million \$2019)							

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

Item	2020	2025	2030	2035	2040	2045	2050
By economic sector - Agriculture (jobs)		859	862	1,713	1,162	991	946
By economic sector - Construction (jobs)		9,020	12,754	20,069	27,860	37,624	51,775
By economic sector - Manufacturing		5,715	6,682	8,722	9,025	10,527	11,949
(jobs)							
By economic sector - Mining (jobs)		5,833	4,629	3,464	2,119	1,170	177
By economic sector - Other (jobs)		757	1,168	2,038	3,094	4,462	6,691
By economic sector - Pipeline (jobs)		453	400	314	221	138	34.6
By economic sector - Professional (jobs)		6,218	9,092	15,620	22,190	31,093	43,932

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

Item	2020	2025	2030	2035	2040	2045	2050
By economic sector - Trade (jobs)		4.607	5.794	8.519	11.777	16.422	23.669
By economic sector - Utilities (jobs)		5,969	7,950	13,593	20.109	29,215	41,956
By resource sector - Biomass (jobs)		2 015	1966	4 225	3 378	3 719	4 303
By resource sector - CO2 (inhs)		0	0.001	0.001	0.001	0,001	0.001
By resource sector - Coal (jobs)		375	0.001	0.001	0.001	0.001	0.001
By resource sector - Grid (jobs)		7/56	12 360	23.070	35.265	52 53/	77156
By resource sector - Grid (Jobs)		1,430	2 205	23,010	1000	1 4 4 1	1,130
By resource sector - Natural das (jobs)		4,473	3,375	2,404	1,700	1,001	1,213
By resource sector - Nuclear (jobs)		11 017	10 / 01	0 07(	0	0	(10
By resource sector - Oil (JODS)		0.205	10,491	6,674	6,072	3,631	010
By resource sector - Solar (JODS)		2,365	2,801	4,008	5,072	0,032	8,603
By resource sector - wind (jobs)		10,413	10,310	31,472	40,871	50,300	89,246
By education level - All sector's - High		16,248	20,233	30,289	39,186	52,329	(1,495
school diploma or less (Jobs)		11 ( 00	1/ 000	00.044	00 770	(1000	F0 10/
By education level - All sectors -		11,692	14,992	22,846	30,779	41,989	58,194
Associates degree or some college (Jobs)		0.000	10.005	1/ 0/ 0	01.050	00 (10	
By education level - All sectors -		8,928	10,895	16,040	21,058	28,412	39,064
Bachelors degree (Jobs)		0.010	07/5	( 100		7 ( 01	40.500
By education level - All sectors - Masters		2,219	2,765	4,183	5,590	7,621	10,580
or professional degree (Jobs)				(0)		1 000	1 707
By education level - All sectors - Doctoral		344	445	696	945	1,292	1,797
degree (jobs)			( 070	10 515	10.0/4	40 ( 07	
Related work experience - All sectors -		5,567	6,972	10,515	13,841	18,687	25,755
None (Jobs)		7000	0.070	1/ 000	10.00/	05 000	05.0/0
Related Work experience - All sectors - Up		7,880	9,878	14,892	19,306	25,809	35,368
to I year (Jobs)		1/ 015	17.0/0	0(70)	05.0/0	(7/57	(5.570
Related work experience - All sectors - 1		14,315	17,843	26,734	35,268	47,657	65,578
to 4 years (jobs)		0.100	11 5 / 0	17.0.(7	00.1/0	01 / 05	(0.0/1
Related Work experience - All sectors - 4		9,183	11,560	17,367	23,162	31,425	43,361
to IU years (Jobs)			0.077				11.070
Related Work experience - All sectors -		2,486	3,077	4,544	5,981	8,066	11,070
Uver IU years (Jobs)		0.000	07/0		<b></b>	747/	0.077
Un-the-Job Training - All sectors - None		2,222	2,742	4,064	5,336	(,176	9,877
(JODS)		0( ) ( 0	00.70/	(0.000	(0.0/0	05.005	11770/
Un-the-Job Training - All Sectors - Up to T		26,463	32,194	48,998	63,868	85,825	117,736
On the Joh Training All sectors 1 to (		70/2	10 11/	15 015	00 E7/	0700/	00 710
Vione (iobe)		1,943	10,116	15,515	20,576	21,990	30,113
On the Joh Training All sectors (, to 10		2 / 20	2 200	6.079	6 070	0444	12 170
Voors (jobs)		2,420	3,200	4,710	0,012	9,444	13,119
On the Job Training All sectors Over 10		202	/.70	409	004	1 202	1 4 9 7
voors (jobs)		303	410	070	900	1,202	1,027
On Site on In Diant Training All costons		6 1.21.	0 002	10 000	16 1/.0	01 012	20.022
None (jobs)		0,434	8,085	12,220	10,147	21,013	30,023
On Site on In Dignt Training All costons		02 010	20.647	44.000	57759	77640	104 595
Un-Sile of In-Plant frammy - An Sector's -		23,918	29,047	44,239	51,155	(1,049	106,585
Op-Site on In-Diant Training All sectors		6 201.	7040	11 05/	15 000	21 / 02	20 4 51
1 to / years (jobs)		0,204	1,002	11,004	10,000	21,403	27,001
On Site on In Dight Training All contars		0 5/1	0.007	E 00E	4 050	0 515	10 007
to 10 years (jobs)		2,301	3,320	5,095	0,909	7,010	13,220
A LU IU YEAI S (JUDS)		21/.	/.10	696	041.	1 10 2	1 4 /.7
Over 10 years (jobs)		514	412	030	004	1,103	1,047
Wago incomo All (million #2010)		2.045	2 500	2 0 2 4	5 955	7101	10.020
vvaye 1160111e - Ali (111111011 \$2017)		2,000	2,077	0,700	0,200	(,171	10,032

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

Item	2020	2025	2030	2035	2040	2045	2050
Final energy use - Transportation (PJ)	286	268	235	195	160	139	131
Final energy use - Residential (PJ)	120	113	102	86.8	74.3	66.4	62.6
Final energy use - Commercial (PJ)	110	107	101	92.6	85.5	81	78.6
Final energy use - Industry (PJ)	174	182	189	190	195	204	206

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

	1.		,				
Item	2020	2025	2030	2035	2040	2045	2050
Electricity distribution capital invested -		1.98	2.05	3.35	3.56	3.35	3.52
Cumulative 5-yr (billion \$2018)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Vehicle stocks - LDV – EV (1000 units)	13.8	233	452	1,220	1,987	2,600	3,213
Vehicle stocks - LDV – All others (1000 units)	2,679	2,551	2,423	1,766	1,109	627	146
Light-duty vehicle capital costs vs. REF - Cumulative 5-yr (million \$2018)		515	1,320	2,139	3,240	3,527	3,363
Public EV charging plugs - DC Fast (1000 units)	0.119		0.964		4.24		6.85
Public EV charging plugs - L2 (1000 units)	0.786		23.3		102		165

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

Item	2020	2025	2030	2035	2040	2045	2050
Sales of space heating units - Electric	4.79	20.7	76.2	90.8	91.9	91.9	91.7
Heat Pump (%)							
Sales of space heating units - Electric	11.9	15	6.62	4.42	4.27	4.39	4.55
Resistance (%)							
Sales of space heating units - Gas (%)	77.4	55.1	13.1	2.17	1.44	1.41	1.38
Sales of space heating units - Fossil (%)	5.87	9.2	4.05	2.66	2.42	2.31	2.37
Sales of water heating units - Electric	0	9.31	49.7	59.7	60.3	60.3	60.3
Heat Pump (%)							
Sales of water heating units - Electric	27.3	41.9	39.5	39.6	39.7	39.7	39.7
Resistance (%)							
Sales of water heating units - Gas Furnace	72.7	48.8	10.7	0.692	0.019	0	0
(%)							
Sales of water heating units - Other (%)	0.024	0.027	0.027	0.027	0.027	0.027	0.027
Sales of cooking units - Electric	66.4	73.6	95.5	99.8	100	100	100
Resistance (%)							
Sales of cooking units - Gas (%)	33.6	26.4	4.52	0.228	0	0	0
Residential HVAC investment in 2020s vs.		3.01	4.04				
REF - Cumulative 5-yr (billion \$2018)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Sales of space heating units - Electric	2.13	24.7	71.3	88	89.8	89.9	89.8
Heat Pump (%)							
Sales of space heating units - Electric	4.54	5.67	7.02	9.23	9.68	9.7	9.71
Resistance (%)							
Sales of space heating units - Gas Furnace	93.3	67.9	21.4	2.81	0.539	0.45	0.45
(%)							
Sales of space heating units - Fossil (%)	0	1.73	0.333	0.014	0	0	0
Sales of water heating units - Electric	0.677	10.7	53.8	64.7	65.3	65.3	65.3
Heat Pump (%)							
Sales of water heating units - Electric	5.85	10.9	28.5	33.6	34	34	34
Resistance (%)							
Sales of water heating units - Gas Furnace	92.9	77.4	17	1.1	0.03	0	0
(%)							
Sales of water heating units - Other (%)	0.567	0.935	0.728	0.68	0.677	0.679	0.679
Sales of cooking units - Electric	44.8	57.1	84	89.3	89.6	89.6	89.6
Resistance (%)							
Sales of cooking units - Gas (%)	55.2	42.9	16	10.7	10.4	10.4	10.4
Commercial HVAC investment in 2020s -		8,255	8,955				
Cumulative 5-yr (million \$2018)							

Item	2020	2025	2030	2035	2040	2045	2050
Installed thermal - Coal (MW)	2,770	0	0	0	0	0	0
Installed thermal - Natural gas (MW)	3,652	2,549	2,760	2,908	3,606	5,664	6,941
Installed thermal - Nuclear (MW)	1,268	0	0	0	0	0	0
Installed renewables - Rooftop PV (MW)	318	560	817	1,203	1,752	2,467	3,398
Installed renewables - Solar - Base land	22.2	22.2	22.2	22.2	22.2	22.2	122
use assumptions (MW)							
Installed renewables - Wind - Base land	7,584	7,664	8,301	11,773	22,479	47,304	81,898
use assumptions (MW)							
Installed renewables - Solar -	22.2	22.2	22.2	22.2	22.2	522	1,195
Constrained land use assumptions (MW)							
Installed renewables - Wind - Constrained	8,454	8,676	9,223	15,669	29,591	57,059	83,147
land use assumptions (MW)							
Installed renewables - Offshore Wind -	0	0	0	0	0	0	0
Constrained land use assumptions (MW)							
Capital invested - Solar PV - Base (billion		0	0	0	0	0	0.093
\$2018)							
Capital invested - Wind - Base (billion		0.117	0.849	4.31	12.7	27.9	36.6
\$2018)							

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

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

Item	2020	2025	2030	2035	2040	2045	2050
Solar - Base land use assumptions (GWh)	58.5	58.5	58.5	58.5	58.5	58.5	274
Wind - Base land use assumptions (GWh)	31,394	31,691	34,060	46,683	84,776	171,754	291,098
OffshoreWind - Base land use assumptions (GWh)	0	0	0	0	0	0	0
Solar - Constrained land use assumptions (GWh)	117	117	117	117	117	2,193	4,951
Wind - Constrained land use assumptions (GWh)	62,787	64,440	68,416	114,196	210,095	394,449	561,516
OffshoreWind - Constrained land use assumptions (GWh)	0	0	0	0	0	0	0

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Low - Accelerate							-74.7
regeneration (1000 tCO2e/y)							
Carbon sink potential - Low - Avoid							-283
deforestation (1000 tCO2e/y)							
Carbon sink potential - Low - Extend							-378
rotation length (1000 tCO2e/y)							
Carbon sink potential - Low - Improve							-22.8
plantations (1000 tCO2e/y)							
Carbon sink potential - Low - Increase							-179
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - Low - Increase							-1,263
trees outside forests (1000 tCO2e/y)							
Carbon sink potential - Low - Reforest							-13,386
cropland (1000 tCO2e/y)							
Carbon sink potential - Low - Reforest							-503
pasture (1000 tCO2e/y)							
Carbon sink potential - Low - Restore							-227
productivity (1000 tCO2e/y)							
Carbon sink potential - Low - All (not							-16,316
counting overlap) (1000 tCO2e/y)							

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

			,				
Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Mid - Accelerate							-112
regeneration (1000 tCO2e/y)							
Carbon sink notential - Mid - Avoid							-992
deforestation (1000 tC02e/v)							
Carbon sink notential - Mid - Extend							-680
notation longth (1000 tC020/y)							-000
Carbon Sink potential - Mid - Improve							-33.4
plantations (1000 tCO2e/y)							
Carbon sink potential - Mid - Increase							-357
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - Mid - Increase							-2,435
trees outside forests (1000 tCO2e/y)							
Carbon sink potential - Mid - Reforest							-20,079
cropland (1000 tCO2e/v)							-,-
Carbon sink notential - Mid - Reforest							-3 575
$p_{1}$							-0,010
Darban eink netentiel Mid Destans							/ [1
							-451
productivity (1000 tC02e/y)							
Carbon sink potential - Mid - All (not							-28,714
counting overlap) (1000 tCO2e/y)							
Carbon sink potential - High - Accelerate							-149
regeneration (1000 tCO2e/y)							
Carbon sink notential - High - Avoid							-1.700
deforestation (1000 tC02e/v)							.,
Carbon sink notential - High - Extend							-983
notation length (1000 tC020/y)							-700
Carbon sink potential - High - Improve							-44.9
plantations (1000 tC02e/y)							
Carbon sink potential - High - Increase							-536
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - High - Increase							-3,607
trees outside forests (1000 tCO2e/y)							
Carbon sink potential - High - Reforest							-26,772
cropland (1000 tCO2e/v)							
Carbon sink notential - High - Reforest							-6 646
$nasture (1000 \pm 0.02 e/v)$							0,040
Carbon sink notantial High All (not							/.1 110
Carbon Sink potential - High - All (not							-41,112
Carbon sink potential - High - Restore							-674
productivity (1000 tCO2e/y)							
Land impacted for carbon sink potential -							12.2
Low - Accelerate regeneration (1000							
hectares)							
Land impacted for carbon sink potential -							216
Low - Avoid deforestation (over 30 years)							-
(1000 hectares)							
Land impacted for earbor eink potential							100
Lanu impacted for Carbon Sink potential -							192
Low - Extend Potation length (1000							
nectaresj							
Land impacted for carbon sink potential -							8.26
Low - Improve plantations (1000							
hectares)							
Land impacted for carbon sink potential -							0
Low - Increase retention of HWP (1000							-
hectares)							
Land impacted for carbon sink notantial							100
Low - Increase troop outside ferente							100
Land impacted for carbon sink potential -							885
Low - Reforest cropland (1000 hectares)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Land impacted for carbon sink potential -							32.7
Low - Reforest pasture (1000 hectares)							
Land impacted for carbon sink notential -							135
Low Postoro productivity (1000							100
nectares							
Land impacted for carbon sink potential -							1,662
Low - Total impacted (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink notential -							18.3
Mid - Accelerate regeneration (1000							10.0
nectaresj							
Land impacted for carbon sink potential -							223
Mid - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							347
Mid - Extend rotation length (1000							_
hactores)							
							10 /
Land Impacted for carbon sink potential -							12.4
Mid - Improve plantations (1000 hectares)							
Land impacted for carbon sink potential -							0
Mid - Increase retention of HWP (1000							
hectares)							
Land impacted for earbon sink notantial							262
Mid Transpoor trace outside ferrests (1000							202
Mid - Increase trees outside forests (1000							
hectaresj							
Land impacted for carbon sink potential -							1,328
Mid - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							237
Mid - Reforest nasture (1000 hectares)							
Lond imposted for earbor eink potential							070
							272
Mid - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							2,699
Mid - Total impacted (over 30 years) (1000							
hectares)							
Land impacted for carbon sink notential -							2/1/1
High Accelerate regeneration (1000							24.4
nectaresj							
Land impacted for carbon sink potential -							230
High - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink notential -							501
High - Extend rotation length (1000							
hastorea)							
Land impacted for carbon sink potential -							16.5
High - Improve plantations (1000							
hectares)							
Land impacted for carbon sink potential -							0
High - Increase retention of HWP (1000							-
hactores)							
							0/0
Land Impacted for carbon sink potential -							343
High - Increase trees outside forests							
(1000 hectares)							
Land impacted for carbon sink potential -							1,770
High - Reforest cropland (1000 hectares)							-
Land impacted for carbon sink notential							120
Ligh Defendet pacture (1000 besteres)							107
Land impacted for carbon sink potential -							223
High - 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 potential - High - Total impacted (over 30 years) (1000 hectares)							3,297

Table 37: <i>E+RE+ scenario</i>	- PILLAR 6: Lana	l sinks - Agriculture
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Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Moderate							-696
deployment - Corn-ethanol to energy							
grasses (1000 tCO2e/y)							
Carbon sink potential - Moderate							-5,387
deployment - Cropland measures (1000							
tCO2e/y)							
Carbon sink potential - Moderate							-312
deployment - Permanent conservation							
cover (1000 tC02e/y)							
Carbon sink potential - Moderate							-6,395
deployment - Total (1000 tCO2e/y)							
Carbon sink potential - Aggressive							-696
deployment - Corn-ethanol to energy							
grasses (1000 tC02e/y)							
Carbon sink potential - Aggressive							-10,263
deployment - Cropland measures (1000							-,
tCO2e/v)							
Carbon sink potential - Aggressive							-624
deployment - Permanent conservation							
cover (1000 tC02e/y)							
Carbon sink potential - Aggressive							-11,583
deployment - Total (1000 tCO2e/y)							
Land impacted for carbon sink - Moderate							413
deployment - Corn-ethanol to energy							
grasses (1000 hectares)							
Land impacted for carbon sink - Moderate							5,430
deployment - Cropland measures (1000							
hectares)							
Land impacted for carbon sink - Moderate							524
deployment - Permanent conservation							
cover (1000 hectares)							
Land impacted for carbon sink - Moderate							6,366
deployment - Total (1000 hectares)							-,
Land impacted for carbon sink -							413
Aggressive deployment - Corn-ethanol to							
energy grasses (1000 hectares)							
Land impacted for carbon sink -							10,336
Aggressive deployment - Cropland							
measures (1000 hectares)							
Land impacted for carbon sink -							1.047
Aggressive deployment - Permanent							,
conservation cover (1000 hectares)							
Land impacted for carbon sink -	+						11.796
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 - Fuel Comb - Electric Generation - Coal (deaths)		22.2	0.022	0.021	0.018	0.011	0

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

Item	2020	2025	2030	2035	20/.0	20/15	2050
Decreative decths from sin collution	2020	2023	2030	2000	2040	2043	2030
Premature deaths from air pollution -		14.6	6.4	6.57	4.98	Z.1	0.837
Fuel Comb - Electric Generation - Natural							
Gas (deaths)							
Premature deaths from air pollution -		45.8	42.9	32.7	19	8.81	3.67
Mobile - On-Road (deaths)							
Premature deaths from air nollution - Gas		4.87	4 51	3 4 3	2 07	105	0 537
Stations (deaths)		4.01	4.01	0.40	2.01	1.00	0.001
			(				
Premature deaths from air pollution -		7.75	6.28	4.12	2.22	1.01	0.406
Fuel Comb - Residential - Natural Gas							
(deaths)							
Premature deaths from air pollution -		0 124	0 10 3	0 072	0.043	0.02	0.007
Fuel Comb Desidential Oil (desthe)		0.124	0.100	0.012	0.040	0.02	0.001
		1 ( 0	1.00		0 / / 1	0.00	- 101
Premature deaths from air pollution -		1.43	1.29	0.99	0.641	0.32	0.131
Fuel Comb - Residential - Other (deaths)							
Premature deaths from air pollution -		0.714	0.687	0.656	0.623	0.588	0.551
Fuel Comb - Comm/Institutional - Coal							
(deaths)							
Dremeture deethe from ein pollution		F 01		0.07	0.07	1.01	0.7
Premature deaths from air pollution -		5.21	4.46	3.26	2.06	1.21	0.67
Fuel Comb - Comm/Institutional - Natural							
Gas (deaths)							
Premature deaths from air pollution -		0.768	0.626	0.495	0.374	0.267	0.173
Fuel Comb - Comm/Institutional - Oil							
(deethe)							
(deaths)							
Premature deaths from air pollution -		0.427	0.36	0.294	0.23	0.169	0.112
Fuel Comb - Comm/Institutional - Other							
(deaths)							
Premature deaths from air pollution -		0.936	0.38	0 371	0 359	0 356	0 303
Industrial Drossesses Cool Mining		0.700	0.00	0.011	0.007	0.000	0.000
(deatha)							
(deaths)							
Premature deaths from air pollution -		85.6	83.6	82.3	69.2	57.7	42.9
Industrial Processes - Oil & Gas							
Production (deaths)							
Monetary damages from air pollution -		197	0 195	0 187	0 156	0 102	0.002
Fuel Comb. Electric Concretion. Cool		171	0.175	0.101	0.150	0.102	0.002
(million \$2019)							
Monetary damages from air pollution -		129	56.7	58.2	44.1	18.6	7.41
Fuel Comb - Electric Generation - Natural							
Gas (million \$2019)							
Monotony domogoo from ain pollution		1.00	201	201	140	70.0	20.4
Mohetary uanages from an ponution -		400	301	291	109	10.3	32.0
Mobile - Un-Road (million \$2019)							
Monetary damages from air pollution -		43.1	39.9	30.4	18.3	9.27	4.76
Gas Stations (million \$2019)							
Monetary damages from air pollution -		68.6	557	36.5	197	896	36
Fuel Comb Desidential Natural Cas		00.0	00.1	00.0	17.1	0.70	0.0
Monetary damages from air pollution -		1.1	0.916	0.641	0.381	0.173	0.066
Fuel Comb - Residential - Oil (million							
\$2019)							
Monetary damages from air pollution -		12.6	11 5	<u> 8 77</u>	5 6 8	2.8/	116
Fuel Camela Desidential Other (million		12.0	11.5	0.11	5.00	2.04	1.10
Fuel Comp - Residential - Other (million							
\$2019)							
Monetary damages from air pollution -		6.32	6.08	5.81	5.51	5.2	4.88
Fuel Comb - Comm/Institutional - Coal							
(million \$2019)							
Monotony domesos from ein pellution		1/1		00.0	10.0	10.7	E 00
monetary usingles from all pollution -		46.1	39.5	28.8	18.3	IU.7	5.93
Fuel Comp - Comm/Institutional - Natural							
Gas (million \$2019)							
Monetary damages from air pollution -		6.8	5.54	4.39	3.31	2.36	1.53
Fuel Comb - Comm/Institutional - Oil							
(million \$2019)							
(mmon #2017)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Monetary damages from air pollution -		3.78	3.18	2.6	2.04	1.5	0.988
Fuel Comb - Comm/Institutional - Other							
(million \$2019)							
Monetary damages from air pollution -		8.26	3.36	3.27	3.16	3.14	2.67
Industrial Processes - Coal Mining							
(million \$2019)							
Monetary damages from air pollution -		760	743	731	614	513	381
Industrial Processes - Oil & Gas							
Production (million \$2019)							

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

Item	2020	2025	2030	2035	2040	2045	2050
By economic sector - Agriculture (jobs)		860	861	2,655	1,576	1,290	939
By economic sector - Construction (jobs)		8,413	12,763	13,586	13,606	14,938	16,343
By economic sector - Manufacturing		5,244	5,100	5,803	5,154	4,644	3,949
By economic sector - Mining (jobs)		5 934	4 822	3 913	2 7 2 0	1999	1 392
By economic sector - Other (jobs)		699	876	1178	1503	1,831	2 345
By economic sector - Pineline (jobs)		471	1.372	956	459	442	509
By economic sector - Professional (jobs)		5,761	6.781	10,103	10,643	12,042	12.573
By economic sector - Trade (jobs)		4,403	4,713	5,626	5,922	6,526	7,066
By economic sector - Utilities (jobs)		6,013	10,748	11,127	10,500	11,643	12,618
By resource sector - Biomass (jobs)		2,016	1,961	8,106	5,263	5,073	4,044
By resource sector - CO2 (jobs)		40.7	7,828	4,824	1,315	1,817	2,913
By resource sector - Coal (jobs)		375	0	0	0	0	0
By resource sector - Grid (jobs)		7,209	9,792	14,049	16,579	18,741	19,917
By resource sector - Natural Gas (jobs)		4,773	4,203	3,688	3,523	2,918	2,520
By resource sector - Nuclear (jobs)		640	630	365	0.032	0.039	0.202
By resource sector - Oil (jobs)		11,915	10,519	9,106	6,609	5,027	3,552
By resource sector - Solar (jobs)		2,217	2,224	2,874	3,673	4,391	6,620
By resource sector - Wind (jobs)		8,612	10,881	11,934	15,120	17,388	18,169
By education level - All sectors - High		15,575	20,021	23,219	21,502	22,558	23,416
school diploma or less (jobs)							
By education level - All sectors -		11,159	14,853	16,481	15,954	17,191	18,219
Associates degree or some college (jobs)							
By education level - All sectors -		8,600	10,252	11,747	11,220	11,929	12,293
Bachelors degree (jobs)							
By education level - All sectors - Masters		2,135	2,537	3,016	2,926	3,150	3,263
or professional degree (jobs)							
By education level - All sectors - Doctoral		328	375	483	481	526	544
degree (jobs)							
Related work experience - All sectors -		5,341	6,932	7,973	7,488	7,948	8,317
None (jobs)							
Related work experience - All sectors - Up		7,531	9,434	11,215	10,462	10,992	11,402
to 1 year (jobs)							
Related work experience - All sectors - 1		13,741	17,367	19,815	18,834	20,059	20,900
to 4 years (jobs)							
Related work experience - All sectors - 4		8,798	11,327	12,645	12,143	13,006	13,633
to 10 years (jobs)					-		
Related work experience - All sectors -		2,386	2,978	3,299	3,156	3,350	3,482
Over 10 years (jobs)							
On-the-Job Training - All sectors - None		2,134	2,600	2,997	2,851	3,029	3,161
(jobs)							
On-the-Job Training - All sectors - Up to 1		25,390	31,514	36,734	34,547	36,493	37,762
year (jobs)							
Un-the-Job Training - All sectors - 1 to 4		7,600	10,148	11,125	10,707	11,508	12,172
years (jobs)		0.000		0 -00	0 - 0 -		
Un-the-Job Training - All sectors - 4 to 10		2,308	3,313	3,593	3,505	3,827	4,120
years (jobs)							

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

Item	2020	2025	2030	2035	2040	2045	2050
On-the-Job Training - All sectors - Over 10		365	462	498	473	498	520
years (jobs)							
On-Site or In-Plant Training - All sectors -		6,151	7,723	8,967	8,531	9,102	9,493
None (jobs)							
On-Site or In-Plant Training - All sectors -		22,956	28,620	33,135	31,203	32,974	34,181
Up to 1 year (jobs)							
On-Site or In-Plant Training - All sectors -		5,940	7,850	8,665	8,305	8,894	9,378
1 to 4 years (jobs)							
On-Site or In-Plant Training - All sectors -		2,450	3,426	3,717	3,597	3,901	4,168
4 to 10 years (jobs)							
On-Site or In-Plant Training - All sectors -		299	418	462	448	483	515
Over 10 years (jobs)							
Wage income - All (million \$2019)		1,986	2,549	2,937	2,817	3,033	3,196
On-Site or In-Plant Training - All sectors - None (jobs) On-Site or In-Plant Training - All sectors - Up to 1 year (jobs) On-Site or In-Plant Training - All sectors - 1 to 4 years (jobs) On-Site or In-Plant Training - All sectors - 4 to 10 years (jobs) On-Site or In-Plant Training - All sectors - Over 10 years (jobs) Wage income - All (million \$2019)		6,151 22,956 5,940 2,450 299 1,986	7,723 28,620 7,850 3,426 418 2,549	8,967 33,135 8,665 3,717 462 2,937	8,531 31,203 8,305 3,597 448 2,817	9,102 32,974 8,894 3,901 483 3,033	9,49 34,1 9,3 4,1¢ 5 3,1 <sup>1</sup>

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

Item	2020	2025	2030	2035	2040	2045	2050
Final energy use - Transportation (PJ)	286	268	235	195	160	139	131
Final energy use - Residential (PJ)	120	113	102	86.8	74.3	66.4	62.6
Final energy use - Commercial (PJ)	110	107	101	92.6	85.5	81	78.6
Final energy use - Industry (PJ)	174	182	189	190	195	204	206

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

		•	•				
Item	2020	2025	2030	2035	2040	2045	2050
Electricity distribution capital invested -		1.98	2.05	3.35	3.56	3.35	3.52
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)	13.8	233	452	1,220	1,987	2,600	3,213
Vehicle stocks - LDV – All others (1000	2,679	2,551	2,423	1,766	1,109	627	146
units)							
Light-duty vehicle capital costs vs. REF -		515	1,320	2,139	3,240	3,527	3,363
Cumulative 5-yr (million \$2018)							
Public EV charging plugs - DC Fast (1000	0.119		0.964		4.24		6.85
units)							
Public EV charging plugs - L2 (1000 units)	0.786		23.3		102		165

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

Item	2020	2025	2030	2035	2040	2045	2050
Sales of space heating units - Electric	4.79	20.7	76.2	90.8	91.9	91.9	91.7
Heat Pump (%)							
Sales of space heating units - Electric	11.9	15	6.62	4.42	4.27	4.39	4.55
Resistance (%)							
Sales of space heating units - Gas (%)	77.4	55.1	13.1	2.17	1.44	1.41	1.38
Sales of space heating units - Fossil (%)	5.87	9.2	4.05	2.66	2.42	2.31	2.37
Sales of water heating units - Electric	0	9.31	49.7	59.7	60.3	60.3	60.3
Heat Pump (%)							
Sales of water heating units - Electric	27.3	41.9	39.5	39.6	39.7	39.7	39.7
Resistance (%)							
Sales of water heating units - Gas Furnace	72.7	48.8	10.7	0.692	0.019	0	0
(%)							
Sales of water heating units - Other (%)	0.024	0.027	0.027	0.027	0.027	0.027	0.027
Sales of cooking units - Electric	66.4	73.6	95.5	99.8	100	100	100
Resistance (%)							
Sales of cooking units - Gas (%)	33.6	26.4	4.52	0.228	0	0	0

## Table 43: E+RE- scenario - PILLAR 1: Efficiency/Electrification - Residential (continued)

				• •	·		
Item	2020	2025	2030	2035	2040	2045	2050
Residential HVAC investment in 2020s vs.		3.01	4.04				

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

Item	2020	2025	2030	2035	2040	2045	2050
Sales of space heating units - Electric	2.13	24.7	71.3	88	89.8	89.9	89.8
Heat Pump (%)							
Sales of space heating units - Electric	4.54	5.67	7.02	9.23	9.68	9.7	9.71
Resistance (%)							
Sales of space heating units - Gas Furnace	93.3	67.9	21.4	2.81	0.539	0.45	0.45
(%)							
Sales of space heating units - Fossil (%)	0	1.73	0.333	0.014	0	0	0
Sales of water heating units - Electric	0.677	10.7	53.8	64.7	65.3	65.3	65.3
Heat Pump (%)							
Sales of water heating units - Electric	5.85	10.9	28.5	33.6	34	34	34
Resistance (%)							
Sales of water heating units - Gas Furnace	92.9	77.4	17	1.1	0.03	0	0
(%)							
Sales of water heating units - Other (%)	0.567	0.935	0.728	0.68	0.677	0.679	0.679
Sales of cooking units - Electric	44.8	57.1	84	89.3	89.6	89.6	89.6
Resistance (%)							
Sales of cooking units - Gas (%)	55.2	42.9	16	10.7	10.4	10.4	10.4
Commercial HVAC investment in 2020s -		8,255	8,955				
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)	2,770	0	0	0	0	0	0
Installed thermal - Natural gas (MW)	3,651	2,541	4,388	4,435	5,576	4,991	4,404
Installed thermal - Nuclear (MW)	1,268	1,268	1,268	0	0.014	0.028	0.111
Installed renewables - Rooftop PV (MW)	318	560	817	1,203	1,752	2,467	3,398
Installed renewables - Solar - Base land	22.2	22.2	22.2	22.2	22.2	22.2	22.2
use assumptions (MW)							
Installed renewables - Wind - Base land	7,384	7,384	7,384	7,744	8,556	8,902	8,902
use assumptions (MW)							
Installed renewables - Solar -	22.2	22.2	22.2	22.2	22.2	22.2	22.2
Constrained land use assumptions (MW)							
Installed renewables - Wind - Constrained	7,594	7,594	7,594	8,159	9,059	9,844	9,844
land use assumptions (MW)							
Installed renewables - Offshore Wind -	0	0	0	0	0	0	0
Constrained land use assumptions (MW)							
Capital invested - Solar PV - Base (billion		0	0	0	0	0	0
\$2018)							
Capital invested - Wind - Base (billion		0	0	0.447	0.999	0.435	0
\$2018)							
Capital invested - Solar PV - Constrained		0	0	0	0	0	0
(billion \$2018)							
Capital invested - Wind - Constrained		0	0	0.7	1.06	0.879	0
(billion \$2018)							

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

		,					
Item	2020	2025	2030	2035	2040	2045	2050
Solar - Base land use assumptions (GWh)	58.5	58.5	58.5	58.5	58.5	58.5	58.5
Wind - Base land use assumptions (GWh)	31,394	31,394	31,394	32,737	35,854	37,276	37,276
OffshoreWind - Base land use	0	0	0	0	0	0	0
assumptions (GWh)							

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

	,	· ·	,			
2020	2025	2030	2035	2040	2045	2050
58.5	58.5	58.5	58.5	58.5	58.5	58.5
31,394	31,394	31,394	33,470	36,713	39,536	39,536
0	0	0	0	0	0	0
	2020 58.5 31,394 0	2020         2025           58.5         58.5           31,394         31,394           0         0	2020         2025         2030           58.5         58.5         58.5           31,394         31,394         31,394           0         0         0	2020         2025         2030         2035           58.5         58.5         58.5         58.5           31,394         31,394         31,394         33,470           0         0         0         0         0	2020         2025         2030         2035         2040           58.5         58.5         58.5         58.5         58.5         58.5           31,394         31,394         31,394         33,470         36,713           0         0         0         0         0         0	2020         2025         2030         2035         2040         2045           58.5         58

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Low - Accelerate							-74.7
regeneration (1000 tCO2e/y)							
Carbon sink potential - Low - Avoid							-283
deforestation (1000 tCO2e/y)							
Carbon sink potential - Low - Extend							-378
rotation length (1000 tCO2e/y)							
Carbon sink potential - Low - Improve							-22.8
plantations (1000 tCO2e/y)							
Carbon sink potential - Low - Increase							-179
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - Low - Increase							-1,263
trees outside forests (1000 tCO2e/y)							
Carbon sink potential - Low - Reforest							-13,386
cropland (1000 tCO2e/y)							
Carbon sink potential - Low - Reforest							-503
pasture (1000 tCO2e/y)							
Carbon sink potential - Low - Restore							-227
productivity (1000 tCO2e/y)							
Carbon sink potential - Low - All (not							-16,316
counting overlap) (1000 tC02e/v)							
Carbon sink potential - Mid - Accelerate							-112
regeneration (1000 tC02e/v)							
Carbon sink potential - Mid - Avoid							-992
deforestation (1000 tC02e/v)							
Carbon sink potential - Mid - Extend							-680
rotation length (1000 tC02e/v)							
Carbon sink potential - Mid - Improve							-33.4
plantations (1000 tC02e/v)							
Carbon sink potential - Mid - Increase							-357
retention of HWP (1000 tC02e/v)							
Carbon sink potential - Mid - Increase							-2,435
trees outside forests (1000 tCO2e/v)							_,
Carbon sink potential - Mid - Reforest							-20.079
cropland (1000 tCO2e/v)							
Carbon sink potential - Mid - Reforest							-3.575
pasture (1000 tC02e/v)							-,
Carbon sink potential - Mid - Restore							-451
productivity (1000 tCO2e/y)							-
Carbon sink potential - Mid - All (not							-28,714
counting overlap) (1000 tCO2e/v)							
Carbon sink potential - High - Accelerate							-149
regeneration (1000 tC02e/v)							
Carbon sink potential - High - Avoid							-1.700
deforestation (1000 tC02e/v)							.,
Carbon sink potential - High - Extend							-983
rotation length (1000 tCO2e/v)							
Carbon sink potential - High - Improve							-44.9
plantations (1000 tCO2e/v)							,
Carbon sink potential - High - Increase							-536
retention of HWP (1000 tCO2e/y)							

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

Itom	2020	2025	2030	2035	20/.0	20/5	2050
Oorhon sink astartial Uinh Insusses	2020	2025	2030	2035	2040	2045	2030
Carbon sink potential - High - Increase							-3,607
trees outside forests (1000 tG02e/y)							
Carbon sink potential - High - Reforest							-26,772
cropland (1000 tCO2e/y)							
Carbon sink potential - High - Reforest							-6,646
pasture (1000 tCO2e/y)							
Carbon sink notential - High - All (not							-41 112
counting overlap) (1000 tC02e/v)							,
Carbon sink notantial High Destand							<u> </u>
Carbon Sink polentiai - High - Restore							-074
productivity (1000 tC02e/y)							
Land impacted for carbon sink potential -							12.2
Low - Accelerate regeneration (1000							
hectares)							
Land impacted for carbon sink potential -							216
Low - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink notential							102
Land impacted for carbon sink potential -							172
Low - Extend rotation length (1000							
hectaresj							
Land impacted for carbon sink potential -							8.26
Low - Improve plantations (1000							
hectares)							
Land impacted for carbon sink notential -							0
Low - Increase retention of HWP (1000							Ū.
hastares)							
Lond imposted for carbon sink potential							100
Lanu impacteu for carbon sink potential -							180
Low - Increase trees outside forests							
(1000 hectares)							
Land impacted for carbon sink potential -							885
Low - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							32.7
Low - Reforest nasture (1000 hectares)							
Land impacted for carbon sink notential							125
Land Impacted for Carbon Sink potential -							100
hectaresj							
Land impacted for carbon sink potential -							1,662
Low - Total impacted (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							18.3
Mid - Accelerate regeneration (1000							
hertares)							
Lond imposted for carbon sink potential							000
							223
Mid - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							347
Mid - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink notential -							12 4
Mid - Improve plantations (1000 bectares)							12.4
Lond imposted for carbon sink potential							
Lanu impacteu ior carbon sink potential -							U
Mid - Increase retention of HWP (1000							
hectares)							
Land impacted for carbon sink potential -							262
Mid - Increase trees outside forests (1000							
hectares)							
Land impacted for carbon sink notential							1 202
Mid - Defenset exertand (1000 besteres)							1,020
I and imposted for containing (1000 Hebbarres)							
Land impacted for carbon sink potential -							237
Mid - Reforest pasture (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 -							272
Mid - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							2,699
Mid - Total impacted (over 30 years) (1000							
hectares)							
Land impacted for carbon sink potential -							24.4
High - Accelerate regeneration (1000							
hectares)							
Land impacted for carbon sink potential -							230
High - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							501
High - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							16.5
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 -							343
High - Increase trees outside forests							
(1000 hectares)							
Land impacted for carbon sink potential -							1,770
High - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							189
High - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							223
High - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							3,297
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							-696
deployment - Corn-ethanol to energy							
grasses (1000 tCO2e/y)							
Carbon sink potential - Moderate							-5,387
deployment - Cropland measures (1000							
tCO2e/y)							
Carbon sink potential - Moderate							-312
deployment - Permanent conservation							
cover (1000 tCO2e/y)							
Carbon sink potential - Moderate							-6,395
deployment - Total (1000 tCO2e/y)							
Carbon sink potential - Aggressive							-696
deployment - Corn-ethanol to energy							
grasses (1000 tCO2e/y)							
Carbon sink potential - Aggressive							-10,263
deployment - Cropland measures (1000							
tCO2e/y)							
Carbon sink potential - Aggressive							-624
deployment - Permanent conservation							
cover (1000 tCO2e/y)							
Carbon sink potential - Aggressive							-11,583
deployment - Total (1000 tCO2e/y)							

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

	a en ne	i louicui o (o	omennaoaj				
Item	2020	2025	2030	2035	2040	2045	2050
Land impacted for carbon sink - Moderate							413
deployment - Corn-ethanol to energy							
grasses (1000 hectares)							
Land impacted for carbon sink - Moderate							5,430
deployment - Cropland measures (1000							
hectares)							
Land impacted for carbon sink - Moderate							524
deployment - Permanent conservation							
cover (1000 hectares)							
Land impacted for carbon sink - Moderate							6,366
deployment - Total (1000 hectares)							
Land impacted for carbon sink -							413
Aggressive deployment - Corn-ethanol to							
energy grasses (1000 hectares)							
Land impacted for carbon sink -							10,336
Aggressive deployment - Cropland							
measures (1000 hectares)							
Land impacted for carbon sink -							1,047
Aggressive deployment - Permanent							
conservation cover (1000 hectares)							
Land impacted for carbon sink -							11,796
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 -		22.2	0.022	0.021	0.018	0.011	0
Fuel Comb - Electric Generation - Coal							
(deaths)							
Premature deaths from air pollution -		13.5	5.35	3.57	2.3	1.04	0.539
Fuel Comb - Electric Generation - Natural							
Gas (deaths)							
Premature deaths from air pollution -		46.6	47.1	46.1	41.7	33.4	23
Mobile - On-Road (deaths)							
Premature deaths from air pollution - Gas		4.97	5.03	4.87	4.4	3.52	2.47
Stations (deaths)							
Premature deaths from air pollution -		7.83	7.2	6.42	5.28	3.87	2.51
Fuel Comb - Residential - Natural Gas							
(deaths)							
Premature deaths from air pollution -		0.127	0.123	0.119	0.108	0.088	0.068
Fuel Comb - Residential - Oil (deaths)							
Premature deaths from air pollution -		1.44	1.48	1.48	1.36	1.08	0.755
Fuel Comb - Residential - Other (deaths)							
Premature deaths from air pollution -		0.714	0.687	0.656	0.623	0.588	0.551
Fuel Comb - Comm/Institutional - Coal							
(deaths)							
Premature deaths from air pollution -		5.24	5.03	4.69	4.09	3.28	2.43
Fuel Comb - Comm/Institutional - Natural							
Gas (deaths)							
Premature deaths from air pollution -		0.768	0.676	0.594	0.513	0.434	0.361
Fuel Comb - Comm/Institutional - Oil							
(deaths)							
Premature deaths from air pollution -		0.427	0.386	0.345	0.305	0.265	0.227
Fuel Comb - Comm/Institutional - Other							
(deaths)							
Premature deaths from air pollution -		1.04	0.383	0.377	0.37	0.366	0.355
Industrial Processes - Coal Mining							
(deaths)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Dremature deaths from air pollution -	2020	8/16	78.2	697	62/1	56	391
Industrial Processes - Oil & Gas		04.0	10.2	07.1	02.4	50	57.1
Draduction (doaths)							
Monotony domagon from ain pollution		107	0.105	0.107	0.15/	0.100	0.000
Mulletary damages from all pullution -		197	0.195	0.187	0.156	0.102	0.002
Monetary damages from air pollution -		120	47.4	31.6	20.3	9.2	4.77
Fuel Comb - Electric Generation - Natural							
Gas (million \$2019)							
Monetary damages from air pollution -		414	419	410	371	297	205
Mobile - On-Road (million \$2019)							
Monetary damages from air pollution -		44	44.5	43.2	38.9	31.2	21.9
Gas Stations (million \$2019)							
Monetary damages from air pollution -		69.4	63.8	56.9	46.8	34.3	22.2
Fuel Comb - Residential - Natural Gas							
(million \$2019)							
Monetary damages from air pollution -		112	109	1.05	0.956	0.782	0.599
Fuel Comb - Residential - Oil (million			1107		01700	0.102	0.077
\$2019)							
Monetary damages from air pollution -		12.8	13.1	12.1	12.1	955	6.69
Fuel Comb - Pesidential - Other (million		12.0	13.1	10.1	12.1	9.00	0.07
Wanatanu damagaa fram ain pollution		( ))	( 00	F 01	<u>г г1</u>	<b>F 0</b>	( 00
Monetary damages from air pollution -		6.32	6.08	5.81	5.51	5.2	4.88
Fuel Comb - Comm/Institutional - Coal							
			··· -				
Monetary damages from air pollution -		46.4	44.5	41.5	36.2	29	21.5
Fuel Comb - Comm/Institutional - Natural							
Gas (million \$2019)							
Monetary damages from air pollution -		6.8	5.99	5.26	4.54	3.84	3.2
Fuel Comb - Comm/Institutional - Oil							
(million \$2019)							
Monetary damages from air pollution -		3.78	3.41	3.05	2.7	2.35	2.01
Fuel Comb - Comm/Institutional - Other							
(million \$2019)							
Monetary damages from air pollution -		9.17	3.38	3.33	3.27	3.23	3.14
Industrial Processes - Coal Mining							
(million \$2019)							
Monetary damages from air pollution -		751	694	619	554	498	347
Industrial Processes - Oil & Gas							
Production (million \$2019)							

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

Item	2020	2025	2030	2035	2040	2045	2050
By economic sector - Agriculture (jobs)		860	866	834	963	2,038	2,070
By economic sector - Construction (jobs)		8,962	15,215	16,762	17,403	22,311	28,310
By economic sector - Manufacturing		5,661	6,346	6,279	5,863	7,380	8,278
(jobs)							
By economic sector - Mining (jobs)		5,891	4,720	3,787	3,045	2,420	1,466
By economic sector - Other (jobs)		749	1,137	1,556	1,949	2,649	3,766
By economic sector - Pipeline (jobs)		460	1,261	864	431	423	458
By economic sector - Professional (jobs)		6,186	8,950	11,211	13,637	19,983	25,127
By economic sector - Trade (jobs)		4,598	5,746	6,792	7,799	10,452	13,262
By economic sector - Utilities (jobs)		6,217	11,548	11,843	11,838	16,813	21,954
By resource sector - Biomass (jobs)		2,017	1,974	1,862	3,210	9,405	9,902
By resource sector - CO2 (jobs)		40.4	7,092	4,368	1,229	1,684	2,612
By resource sector - Coal (jobs)		375	0	0	0	0	0
By resource sector - Grid (jobs)		7,562	12,095	15,756	19,402	28,831	38,018
By resource sector - Natural Gas (jobs)		4,579	3,250	2,460	1,999	1,644	1,310
By resource sector - Nuclear (jobs)		640	630	365	0.014	0.014	0.027
By resource sector - Oil (jobs)		11,953	10,712	9,618	8,520	7,290	4,603

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

	0000	0005	0000	0005	00/0	0015	0050
Item	2020	2025	2030	2035	2040	2045	2050
By resource sector - Solar (Jobs)		2,333	2,516	3,177	3,904	4,727	7,426
By resource sector - Wind (jobs)		10,085	17,519	22,321	24,663	30,888	40,820
By education level - All sectors - High		16,296	23,075	24,529	25,443	34,120	42,057
school diploma or less (jobs)							
By education level - All sectors -		11,727	17,284	18,626	19,501	26,055	32,774
Associates degree or some college (jobs)							
By education level - All sectors -		8,982	11,970	12,928	13,766	18,509	22,709
Bachelors degree (jobs)							
By education level - All sectors - Masters		2,233	2,998	3,312	3,611	4,937	6,103
or professional degree (jobs)							
By education level - All sectors - Doctoral		345	461	532	606	849	1,047
degree (jobs)							
Related work experience - All sectors -		5,587	7,990	8,546	8,941	12,059	14,975
None (jobs)							
Related work experience - All sectors - Up		7,900	11,021	11,865	12,453	16,874	20,856
to 1 year (jobs)							
Related work experience - All sectors - 1		14,377	20,147	21,655	22,815	30,581	37,839
to 4 years (jobs)		-		-			
Related work experience - All sectors - 4		9,221	13,169	14,163	14,863	19,839	24,689
to 10 years (jobs)							
Related work experience - All sectors -		2,499	3,462	3.699	3.856	5,116	6,332
Over 10 years (jobs)		,	-, -	- , -	-,	-, -	-,
On-the-Job Training - All sectors - None		2.233	3.041	3.283	3.473	4.671	5.772
(iobs)		_,	-,	-,	-,	.,	-,
On-the-Job Training - All sectors - Un to 1		26.569	36.627	39.340	41,448	55,940	68,933
vear (iobs)							
On-the-Joh Training - All sectors - 1 to 4		7972	11 748	12 589	13 098	17.361	21764
vears (inhs)		1,712		12,007	10,070	11,001	21,101
On-the-Joh Training - All sectors - 4 to 10		2 425	3 831	4 143	4 326	5 742	7286
vears (inhs)		2, 120	0,001	1,110	1,020	0,1 12	1,200
On-the-Joh Training - All sectors - Over 10		384	542	573	584	756	934
vears (inhs)		004	042	010	004	100	704
On-Site or In-Plant Training - All sectors -		6 4 5 7	9.056	9788	10 360	13 987	17 356
None (jobe)		0,401	7,000	2,100	10,000	10,701	11,000
On-Site or In-Diant Training - All sectors -		2/, 016	33 017	35.6/.2	37/.73	50 / 61	62.245
Un to 1 year (jobe)		24,010	55,211	55,042	51,415	50,401	02,245
On Site on In Diant Training All sectors		6 007	0.002	0725	10 10 2	12 /.94	16 770
1 to / years (jobs)		0,221	2,003	7,120	10,122	13,420	10,117
On Site on In Dight Training All sectors		9 6 4 9	20/.0	1. 250	1, 1,00	E 0/E	7904
( to 10 yoans (jobs)		2,008	3,749	4,200	4,420	5,005	1,300
4 LU IU YEAR'S (JUUS)		01/	(.0.)	FOO		701	00/
Over 10 veers (jobs)		314	484	523	545	(31	924
		0.07/	0.0/7	0.100	0.4.04		
wage income - All (million \$2019)		2,076	2,947	3,199	3,404	4,625	5,793

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

Item	2020	2025	2030	2035	2040	2045	2050
Final energy use - Transportation (PJ)	287	270	245	226	212	195	175
Final energy use - Residential (PJ)	120	114	109	103	93.6	83.1	73.8
Final energy use - Commercial (PJ)	110	107	104	99.9	95.2	90.4	86.3
Final energy use - Industry (PJ)	174	182	190	193	200	209	211

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

	,, =						
Item	2020	2025	2030	2035	2040	2045	2050
Electricity distribution capital invested -		1.64	1.66	2.05	2.12	3.02	3.19
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)	10.7	75.1	140	438	737	1,397	2,058
Vehicle stocks - LDV – All others (1000	2,690	2,690	2,690	2,552	2,413	1,860	1,306
units)							
Light-duty vehicle capital costs vs. REF -		0	83.3	175	591	1,861	2,710
Cumulative 5-yr (million \$2018)							
Public EV charging plugs - DC Fast (1000	0.119		0.298		1.57		4.39
units)							
Public EV charging plugs - L2 (1000 units)	0.786		7.18		37.9		106

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

Item	2020	2025	2030	2035	2040	2045	2050
Sales of space heating units - Electric	4.79	10.1	16.5	34.7	63.2	82.5	89.3
Heat Pump (%)							
Sales of space heating units - Electric	11.9	16.6	15.6	12.9	8.54	5.65	4.74
Resistance (%)							
Sales of space heating units - Gas (%)	77.4	63	58.2	44.5	23.1	8.65	3.34
Sales of space heating units - Fossil (%)	5.87	10.2	9.69	7.94	5.1	3.2	2.63
Sales of water heating units - Electric	0	1.62	6.21	19.5	40	53.6	58.5
Heat Pump (%)							
Sales of water heating units - Electric	27.3	42.3	42	41.2	40.3	39.8	39.7
Resistance (%)							
Sales of water heating units - Gas Furnace	72.7	56	51.8	39.3	19.8	6.56	1.76
(%)							
Sales of water heating units - Other (%)	0.024	0.027	0.027	0.027	0.027	0.027	0.027
Sales of cooking units - Electric	66.3	67.2	70.2	78.4	89.7	96.7	99.1
Resistance (%)							
Sales of cooking units - Gas (%)	33.7	32.8	29.8	21.6	10.3	3.33	0.895
Residential HVAC investment in 2020s vs.		2.99	4.02				
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	2.13	16	21.4	36.9	61.7	79.8	87
Heat Pump (%)							
Sales of space heating units - Electric	4.54	5.5	5.66	6.18	7.29	8.59	9.36
Resistance (%)							
Sales of space heating units - Gas Furnace	93.3	76.5	71.1	55.5	30.3	11.4	3.55
(%)							
Sales of space heating units - Fossil (%)	0	2	1.88	1.4	0.684	0.222	0.059
Sales of water heating units - Electric	0.677	2.54	7.44	21.6	43.5	58.2	63.4
Heat Pump (%)							
Sales of water heating units - Electric	5.85	7.67	9.68	15.4	24.5	30.8	33.1
Resistance (%)							
Sales of water heating units - Gas Furnace	92.9	88.8	81.9	62.1	31.2	10.4	2.79
(%)							
Sales of water heating units - Other (%)	0.567	0.974	0.953	0.882	0.777	0.711	0.687
Sales of cooking units - Electric	44.8	49.3	53.1	63	76.9	85.5	88.5
Resistance (%)							
Sales of cooking units - Gas (%)	55.2	50.7	46.9	37	23.1	14.5	11.5
Commercial HVAC investment in 2020s -		8,253	8,961				
Cumulative 5-yr (million \$2018)							

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

	,		5				
Item	2020	2025	2030	2035	2040	2045	2050
Installed thermal - Coal (MW)	2,770	0	0	0	0	0	0
Installed thermal - Natural gas (MW)	3,651	2,551	2,559	2,623	2,237	2,191	2,809
Installed thermal - Nuclear (MW)	1,268	1,268	1,268	0	0.006	0.011	0.021

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

	2100011010)	aonor ach	ig capacity	(continuou)	,		
Item	2020	2025	2030	2035	2040	2045	2050
Capital invested - Biomass power plant	0	0.004	0.02	0	0	0	0
(billion \$2018)							
Capital invested - Biomass w/ccu allam	0	0	0	0	0	0.009	0
power plant (billion \$2018)							
Capital invested - Biomass w/ccu power	0	0	0	0	13.7	21.5	9.82
plant (billion \$2018)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Biomass power plant (GWh)	0	7.3	46.3	46.3	46.3	46.3	46.3
Biomass w/ccu power plant (GWh)	0	0	0	0	15,353	39,484	50,500
Biomass w/ccu allam power plant (GWh)	0	0	0	0	0	8.96	8.96

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

Item	2020	2025	2030	2035	2040	2045	2050
Number of facilities - Power (quantity)	0	1	1	1	1	1	1
Number of facilities - Power ccu	0	0	0	0	12	32	40
(quantity)							
Number of facilities - Allam power w ccu	0	0	0	0	0	1	1
(quantity)							
Number of facilities - Beccs hydrogen	0	0	0	0	0	14	14
(quantity)							
Number of facilities - Diesel (quantity)	0	0	0	1	1	1	1
Number of facilities - Diesel ccu (quantity)	0	0	0	0	0	1	1
Number of facilities - Pyrolysis (quantity)	0	0	0	1	1	1	1
Number of facilities - Pyrolysis ccu	0	0	0	0	0	1	2
(quantity)							
Number of facilities - Sng (quantity)	0	1	1	1	1	1	1
Number of facilities - Sng ccu (quantity)	0	0	0	0	0	0	0
Conversion capital investment -		4.25	22.2	27.7	12,551	31,594	9,940
Cumulative 5-yr (million \$2018)							
Biomass purchases (million \$2018/y)		60	154	156	1,144	3,772	4,531

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

Item	2020	2025	2030	2035	2040	2045	2050
Annual - All (MMT)		0	0	0.03	18.5	57.7	69
Annual - BECCS (MMT)		0	0	0	15.2	54.3	65.5
Annual - NGCC (MMT)		0	0	0.03	0.03	0.02	0.02
Annual - Cement and lime (MMT)		0	0	0	3.32	3.42	3.53
Cumulative - All (MMT)		0	0	0.03	18.6	76.3	145
Cumulative - BECCS (MMT)		0	0	0	15.2	69.5	135
Cumulative - NGCC (MMT)		0	0	0.03	0.06	0.08	0.1
Cumulative - Cement and lime (MMT)		0	0	0	3.32	6.74	10.3

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

Item	2020	2025	2030	2035	2040	2045	2050
Trunk (km)		0	997	1,361	1,725	1,725	1,725
Spur (km)		0	58.5	117	1,026	2,994	3,323
All (km)		0	1,055	1,478	2,751	4,720	5,048
Cumulative investment - Trunk (million		0	5,174	7,488	9,761	9,761	9,761
\$2018)							
Cumulative investment - Spur (million		0	30.8	61.8	951	2,889	3,347
\$2018)							
Cumulative investment - All (million		0	5,205	7,550	10,712	12,651	13,109
\$2018)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Annual (MMT)		0	0.92	3.21	7.13	9.85	10
Injection wells (wells)		0	2	7	12	20	25
Resource characterization, appraisal,		77.2	216	278	278	278	278
permitting costs (million \$2020)							
Wells and facilities construction costs		0	51.4	200	357	597	741
(million \$2020)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Low - Accelerate							-74.7
regeneration (1000 tCO2e/y)							
Carbon sink potential - Low - Avoid							-283
deforestation (1000 tCO2e/y)							
Carbon sink potential - Low - Extend							-378
rotation length (1000 tCO2e/y)							
Carbon sink potential - Low - Improve							-22.8
plantations (1000 tCO2e/y)							
Carbon sink potential - Low - Increase							-179
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - Low - Increase							-1,263
trees outside forests (1000 tCO2e/y)							
Carbon sink potential - Low - Reforest							-13,386
cropland (1000 tCO2e/y)							
Carbon sink potential - Low - Reforest							-503
pasture (1000 tCO2e/y)							
Carbon sink potential - Low - Restore							-227
productivity (1000 tCO2e/y)							
Carbon sink potential - Low - All (not							-16,316
counting overlap) (1000 tCO2e/y)							
Carbon sink potential - Mid - Accelerate							-112
regeneration (1000 tCO2e/y)							
Carbon sink potential - Mid - Avoid							-992
deforestation (1000 tCO2e/y)							
Carbon sink potential - Mid - Extend							-680
rotation length (1000 tCO2e/y)							
Carbon sink potential - Mid - Improve							-33.4
plantations (1000 tCO2e/y)							
Carbon sink potential - Mid - Increase							-357
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - Mid - Increase							-2,435
trees outside forests (1000 tCO2e/y)							
Carbon sink potential - Mid - Reforest							-20,079
cropland (1000 tCO2e/y)							
Carbon sink potential - Mid - Reforest							-3,575
pasture (1000 tCO2e/y)							
Carbon sink potential - Mid - Restore							-451
productivity (1000 tCO2e/y)							
Carbon sink potential - Mid - All (not							-28,714
counting overlap) (1000 tCO2e/y)							
Carbon sink potential - High - Accelerate							-149
regeneration (1000 tCO2e/y)							
Carbon sink potential - High - Avoid							-1,700
deforestation (1000 tCO2e/y)							
Carbon sink potential - High - Extend							-983
rotation length (1000 tCO2e/y)							
Carbon sink potential - High - Improve							-44.9
plantations (1000 tCO2e/y)							

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

Tt	0000	0005	0000	0005	00/0	00/5	0050
Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - High - Increase							-536
retention of HWP (1000 tCO2e/y)							
Carbon sink notential - High - Increase							-3 607
trace estable ference (1000 to00e (s))							-0,001
Carbon sink potential - High - Reforest							-26,772
cropland (1000 tCO2e/y)							
Carbon sink notential - High - Reforest							-6 646
							0,010
Carbon sink potential - High - All (not							-41,112
counting overlap) (1000 tCO2e/y)							
Carbon sink notential - High - Restore							-674
productivity (1000 ±0020/y)							014
Land impacted for carbon sink potential -							12.2
Low - Accelerate regeneration (1000							
hectares)							
Land impacted for carbon sink notential -							216
							210
Low - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							192
Low - Extend rotation length (1000							
nectares							
Land impacted for carbon sink potential -							8.26
Low - Improve plantations (1000							
hectares)							
Land impacted for earbor eight potential							
Land impacted for carbon sink potential -							U
Low - Increase retention of HWP (1000							
hectares)							
Land impacted for carbon sink notential -							180
Low Increase trees outside forests							100
(IUUU nectares)							
Land impacted for carbon sink potential -							885
Low - Reforest cropland (1000 hectares)							
Land impacted for carbon sink notential							307
							52.1
Low - Reforest pasture (1000 nectares)							
Land impacted for carbon sink potential -							135
Low - Restore productivity (1000							
hectores)							
							1 / / 0
Land impacted for carbon sink potential -							1,662
Low - Total impacted (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink notential							18.3
Mid Accelerate regeneration (1000							10.5
Mid - Accelerate regeneration (1000							
hectares)							
Land impacted for carbon sink potential -							223
Mid - Avoid deforestation (over 30 years)							
(1000 hostopoo)							
Land impacted for carbon sink potential -							347
Mid - Extend rotation length (1000							
hectares)							
Land impacted for earbor eink notential							10 /
Lanu impacteu fur Garbun Silik putential -							12.4
Mid - Improve plantations (1000 hectares)							
Land impacted for carbon sink potential -							0
Mid - Increase retention of HWP (1000							
hartanas)							
Land impacted for carbon sink potential -							262
Mid - Increase trees outside forests (1000							
hectares)							
Land impacted for carbon sink notontial							1 200
							1,320
Mila - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -	$ $ $\top$				T		237
Mid - Reforest pasture (1000 hectares)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Land impacted for carbon sink potential -							272
Mid - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							2,699
Mid - Total impacted (over 30 years) (1000							
hectares)							
Land impacted for carbon sink potential -							24.4
High - Accelerate regeneration (1000							
hectares)							
Land impacted for carbon sink potential -							230
High - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							501
High - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							16.5
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 -							343
High - Increase trees outside forests							
(1000 hectares)							
Land impacted for carbon sink potential -							1,770
High - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							189
High - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							223
High - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							3,297
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 potential - Moderate							-2,596
deployment - Corn-ethanol to energy							
grasses (1000 tCO2e/y)							
Carbon sink potential - Moderate							-4,848
deployment - Cropland measures (1000							
tCO2e/y)							
Carbon sink potential - Moderate							-278
deployment - Permanent conservation							
cover (1000 tCO2e/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 tC02e/y)							
Carbon sink potential - Moderate							-7,721
deployment - Total (1000 tCO2e/y)							
Carbon sink potential - Aggressive							-2,596
deployment - Corn-ethanol to energy							
grasses (1000 tCO2e/y)							
Carbon sink potential - Aggressive							-9,241
deployment - Cropland measures (1000							
tCO2e/y]							

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Aggressive							-556
deployment - Permanent conservation							
cover (1000 tCO2e/y)							
Carbon sink potential - Aggressive							0
deployment - Cropland to woody energy							
crops (1000 tCO2e/y)							
Carbon sink potential - Aggressive							0
deployment - Pasture to energy crops							
(1000 tC02e/y)							
Carbon sink potential - Aggressive							-12,393
deployment - Total (1000 tC02e/v)							,
Land impacted for carbon sink - Moderate							1.528
deployment - Corn-ethanol to energy							.,===
grasses (1000 hectares)							
Land impacted for carbon sink - Moderate							4.878
deployment - Cropland measures (1000							.,
hectares)							
Land impacted for carbon sink - Moderate							466
deployment - Permanent conservation							
cover (1000 hectares)							
Land impacted for carbon sink - Moderate							496
deployment - Cropland to woody energy							170
crons (1000 hectares)							
Land impacted for carbon sink - Moderate							1.272
denloyment - Pasture to energy crons							.,
(1000 hectares)							
Land impacted for carbon sink - Moderate							8 639
denlovment - Total (1000 hectares)							0,007
Land impacted for carbon sink -							1.528
Aggressive deployment - Corn-ethanol to							1,020
energy grasses (1000 hectares)							
Land impacted for carbon sink -							22 937
Aggressive denloyment - Cronland							22,701
measures (1000 hectares)							
Land impacted for carbon sink -							931
Aggressive denloyment - Permanent							201
conservation cover (1000 bectares)							
Land impacted for carbon sink -							496
Aggressive denloyment - Cronland to							-770
woody energy crops (1000 hectares)							
Land impacted for carbon sink -							1 979
Aggressive denloyment - Pasture to							1,212
energy crons (1000 hectares)							
Land impacted for carbon sink -							27165
Aggressive denloyment - Total (1000							21,100
hectares)							

## Table 64: REF scenario - IMPACTS - Health

Item	2020	2025	2030	2035	2040	2045	2050
Premature deaths from air pollution -		77.6	39	24.5	19.5	17	16.6
Fuel Comb - Electric Generation - Coal							
(deaths)							
Premature deaths from air pollution -		14.4	12.7	13.2	9.19	8.31	7.03
Fuel Comb - Electric Generation - Natural							
Gas (deaths)							
Premature deaths from air pollution -		46.6	47.8	49.2	50.8	52.3	53.9
Mobile - On-Road (deaths)							
Premature deaths from air pollution - Gas		4.95	5.07	5.18	5.32	5.44	5.55
Stations (deaths)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Premature deaths from air nollution -		768	705	6.48	6 14	599	59
Fuel Comb - Residential - Natural Gas				0.10	0.11	0177	0.7
(deaths)							
Premature deaths from air pollution -		0 125	0 109	0.082	0.055	0.033	0.021
Fuel Comb - Residential - Oil (deaths)		0.120	0.107	0.002	0.000	0.000	0.021
Dremature deaths from air pollution -		1 2/.	1 2 2	1 3 2	1 3/.	1 2/.	1 2/.
Freihaldre deaths ir off air polition -		1.54	1.52	1.52	1.54	1.54	1.54
Premotune dootho from on pollution		07//	0.751	0.750	0.750	07/0	07/0
Fremature deaths from air poliution -		0.746	0.751	0.753	0.752	0.749	0.743
Fuel Comp - Comm/Institutional - Coal							
(deaths)							
Premature deaths from air pollution -		5.3	5.16	4.72	4.25	4	4.01
Fuel Comb - Comm/Institutional - Natural							
Gas (deaths)							
Premature deaths from air pollution -		0.801	0.792	0.783	0.771	0.762	0.758
Fuel Comb - Comm/Institutional - Oil							
(deaths)							
Premature deaths from air pollution -		0.446	0.457	0.469	0.48	0.49	0.502
Fuel Comb - Comm/Institutional - Other							
(deaths)							
Premature deaths from air pollution -		2.3	1.59	1.27	1.2	1.15	1.07
Industrial Processes - Coal Mining							
(deaths)							
Premature deaths from air nollution -		85	89.3	91 4	88	87.3	81.2
Industrial Processes - Oil & Gas		00	07.0	711-7	00	01.0	01.2
Production (deaths)							
Monetary damages from air pollution -		687	3/15	017	170	151	1/.7
Fuel Camp Electric Concretion Cool		001	345	211	172	101	147
(million #0010)							
		107	110	117	01 /	70 (	(0.0
Monetary damages from air pollution -		127	113	117	81.4	73.6	62.3
Fuel Comb - Electric Generation - Natural							
Gas (million \$2019)							
Monetary damages from air pollution -		414	425	437	452	465	479
Mobile - On-Road (million \$2019)							
Monetary damages from air pollution -		43.8	44.9	45.8	47.1	48.2	49.1
Gas Stations (million \$2019)							
Monetary damages from air pollution -		68.1	62.4	57.4	54.4	53.1	52.3
Fuel Comb - Residential - Natural Gas							
(million \$2019)							
Monetary damages from air pollution -		1.1	0.969	0.73	0.49	0.297	0.187
Fuel Comb - Residential - Oil (million							
\$2019)							
Monetary damages from air pollution -		11.9	11.7	11.7	11.9	11.9	11.9
Fuel Comh - Residential - Other (million							
\$2019)							
Monetary damages from air pollution -		6.6	6.65	6.67	6.66	6.63	6 57
Fuel Comb - Comm/Institutional - Coal		0.0	0.00	0.01	0.00	0.00	0.01
(million \$2019)							
Monotony domagon from ain pollution		1.7	45.6	/.1 0	27.6	25.7	25.5
Monetary utiliages from an pollution -		41	45.0	41.0	31.0	55.4	55.5
Fuel Comp - Comm/Institutional - Natural							
Gas (million \$2019)							
Monetary damages from air pollution -		7.09	7.01	6.93	6.83	6.74	6.71
Fuel Comb - Comm/Institutional - Oil							
[million \$2019]							
Monetary damages from air pollution -		3.95	4.05	4.15	4.25	4.34	4.44
Fuel Comb - Comm/Institutional - Other							
(million \$2019)							
Monetary damages from air pollution -		20.3	14	11.2	10.6	10.2	9.48
Industrial Processes - Coal Mining							
(million \$2019)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Monetary damages from air pollution -		754	793	812	782	775	721
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)		860	859	859	859	859	859
By economic sector - Construction (jobs)		5,800	7,374	7,919	9,473	10,950	12,454
By economic sector - Manufacturing		4,185	4,465	4,513	4,728	4,691	4,522
(jobs)							
By economic sector - Mining (jobs)		6,031	5,018	4,165	3,379	2,800	2,180
By economic sector - Other (jobs)		344	642	794	1,092	1,384	1,905
By economic sector - Pipeline (jobs)		470	487	493	472	476	465
By economic sector - Professional (jobs)		4,312	4,933	5,211	6,411	7,436	8,449
By economic sector - Trade (jobs)		3,781	3,920	3,948	4,507	5,068	5,744
By economic sector - Utilities (jobs)		5,392	6,026	6,066	7,026	8,468	8,992
By resource sector - Biomass (jobs)		2,016	1,960	1,909	1,863	1,823	1,786
By resource sector - CO2 (jobs)		0	0.046	0.058	0.063	0.07	0.074
By resource sector - Coal (jobs)		910	446	93.8	0	0	0
By resource sector - Grid (jobs)		6,175	7,402	7,876	9,804	12,491	14,336
By resource sector - Natural Gas (jobs)		4,731	4,992	4,767	4,426	4,901	4,523
By resource sector - Nuclear (jobs)		640	630	620	610	354	0.034
By resource sector - Oil (jobs)		11,978	10,778	9,779	8,871	8,157	7,070
By resource sector - Solar (jobs)			1,977	2,737	3,510	4,257	6,599
By resource sector - Wind (jobs)		4,723	5,540	6,185	8,862	10,148	11,256
By education level - All sectors - High		12,841	14,001	14,157	15,766	17,475	18,910
school diploma or less (jobs)			·	·			
By education level - All sectors -		9,027	9,963	10,120	11,481	12,939	14,153
Associates degree or some college (jobs)			-				
By education level - All sectors -		7,255	7,595	7,528	8,282	9,049	9,633
Bachelors degree (jobs)							
By education level - All sectors - Masters		1,786	1,881	1,875	2,090	2,306	2,480
or professional degree (jobs)							
By education level - All sectors - Doctoral		265	284	286	327	362	395
degree (jobs)							
Related work experience - All sectors -		4,408	4,802	4,854	5,434	6,067	6,594
None (jobs)							
Related work experience - All sectors - Up		6,152	6,706	6,787	7,593	8,400	9,125
to 1 year (jobs)							
Related work experience - All sectors - 1		11,406	12,272	12,329	13,743	15,247	16,456
to 4 years (jobs)							
Related work experience - All sectors - 4		7,231	7,829	7,881	8,830	9,835	10,632
to 10 years (jobs)		107(	0.415	0.447		0.500	
Related work experience - All sectors -		1,976	2,115	2,117	2,346	2,583	2,763
Uver IU years (jobs)		1750	1 0 0 0	1.005	0.00/	0.005	0 ( 07
Un-the-Job Training - All sectors - None		1,758	1,883	1,885	2,096	2,305	2,497
(JODS)		01 100	00 ( 5 (	007/0	05 070	07.000	20.0/1
Un-the-Job maining - All Sectors - Up to 1		21,122	22,656	22,749	25,270	21,893	30,041
On the Joh Training All sectors 1 to /		6 177	6 700	6 077	7750	0 715	0 / 01
Verse (jobs)		0,177	0,190	0,011	1,139	0,010	9,401
On-the-loh Training - All sectors - /, to 10		1 8 2 7	2 077	2 136	2/16/1	2 828	3 132
vears (inhs)		1,021	2,011	2,100	2,404	2,020	5,152
On-the- Job Training - All sectors - Over 10		290	318	321	357	390	<i>L</i> 19
vears (iobs)		270	010	021	001	070	717
On-Site or In-Plant Training - All sectors -		5.013	5.429	5.467	6.129	6.793	7.366
None (jobs)		5,0.0	-,	-,	21.27	5,5	.,
On-Site or In-Plant Training - All sectors -		19,102	20,506	20,593	22,880	25,278	27,237
Up to 1 year (jobs)							

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

Item	2020	2025	2030	2035	2040	2045	2050
On-Site or In-Plant Training - All sectors -		4,848	5,313	5,376	6,048	6,774	7,359
1 to 4 years (jobs)							
On-Site or In-Plant Training - All sectors -		1,971	2,205	2,252	2,570	2,922	3,207
4 to 10 years (jobs)							
On-Site or In-Plant Training - All sectors -		240	271	278	319	365	401
Over 10 years (jobs)							
Wage income - All (million \$2019)		1,657	1,800	1,829	2,060	2,313	2,520

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

Item	2020	2025	2030	2035	2040	2045	2050
Final energy use - Transportation (PJ)	286	270	247	233	233	241	250
Final energy use - Residential (PJ)	120	113	109	106	105	106	106
Final energy use - Commercial (PJ)	110	110	109	108	107	108	111
Final energy use - Industry (PJ)	174	186	192	198	205	212	220

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

Item	2020	2025	2030	2035	2040	2045	2050
Electricity distribution capital invested -		1.74	1.77	1.9	1.95	2.5	2.61
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	2.8	27.6	29.1	31.3	32.6	33.7	35
Heat Pump (%)							
Sales of space heating units - Electric	12.4	13.9	13.6	13.3	13.1	12.1	10.6
Resistance (%)							
Sales of space heating units - Gas (%)	78.7	51.5	50.2	48.4	47.5	47.5	47.5
Sales of space heating units - Fossil (%)	6.08	6.99	7.07	7.06	6.83	6.72	6.86
Sales of water heating units - Electric	0	0	0	0	0	0	0
Heat Pump (%)							
Sales of water heating units - Electric	27.3	42.4	42.3	42.2	42.2	42.2	42.1
Resistance (%)							
Sales of water heating units - Gas Furnace	72.7	57.5	57.6	57.7	57.7	57.8	57.8
(%)							
Sales of water heating units - Other (%)	0.024	0.027	0.027	0.027	0.027	0.027	0.027
Sales of cooking units - Electric	66	66	66	66	66	66	66
Resistance (%)							
Sales of cooking units - Gas (%)	34	34	34	34	34	34	34
Residential HVAC investment in 2020s vs.		2.83	3.07				
REF - Cumulative 5-yr (billion \$2018)							

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	VEL SCENULIO -	FILLAN I. L			uuon - 0	JUITITIELLIUI

Item	2020	2025	2030	2035	2040	2045	2050
Sales of space heating units - Electric	2.13	20.6	48.3	71.1	74.8	75.3	75.3
Heat Pump (%)							
Sales of space heating units - Electric	4.54	6.37	10.8	18.4	23.4	24.2	24.3
Resistance (%)							
Sales of space heating units - Gas Furnace	93.3	71.1	39.4	9.85	1.63	0.515	0.452
(%)							
Sales of space heating units - Fossil (%)	0	1.96	1.54	0.687	0.101	0.009	0
Sales of water heating units - Electric	0.677	0.816	0.812	0.813	0.809	0.806	0.805
Heat Pump (%)							
Sales of water heating units - Electric	5.85	6.96	6.99	6.96	6.96	6.97	6.97
Resistance (%)							
Sales of water heating units - Gas Furnace	92.9	91.2	91.2	91.2	91.2	91.2	91.2
(%)							

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

Item	2020	2025	2030	2035	2040	2045	2050	
Sales of water heating units - Other (%)	0.567	0.983	0.985	0.982	0.982	0.985	0.986	
Sales of cooking units - Electric	44.8	47.8	47.9	47.8	47.9	47.9	48	
Resistance (%)								
Sales of cooking units - Gas (%)	55.2	52.2	52.1	52.2	52.1	52.1	52	
Commercial HVAC investment in 2020s -		8,160	8,377					
Cumulative 5-yr (million \$2018)								

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

Item	2020	2025	2030	2035	2040	2045	2050
Installed thermal - Coal (MW)	2,770	2,050	720	0	0	0	0
Installed thermal - Natural gas (MW)	3,635	2,556	5,255	5,257	5,016	7,758	8,316
Installed thermal - Nuclear (MW)	1,268	1,268	1,268	1,268	1,268	0	0.015
Installed renewables - Rooftop PV (MW)	318	560	817	1,203	1,752	2,467	3,398
Installed renewables - Wind - Base land	7,188	7,188	7,188	7,188	7,188	7,426	7,426
use assumptions (MW)							
Installed renewables - Solar -	22.2	22.2	22.2	22.2	22.2	22.2	22.2
Constrained land use assumptions (MW)							
Installed renewables - Wind - Constrained	196	196	196	196	196	196	196
land use assumptions (MW)							

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

	,						
Item	2020	2025	2030	2035	2040	2045	2050
Solar - Base land use assumptions (GWh)	58.5	58.5	58.5	58.5	58.5	58.5	58.5
Wind - Base land use assumptions (GWh)	31,394	31,394	31,394	31,394	31,394	32,282	32,282
OffshoreWind - Base land use	0	0	0	0	0	0	0
assumptions (GWh)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Business-as-usual carbon sink - Natural	-6.75		0.507				0.145
uptake (Mt CO2e/y)							
Business-as-usual carbon sink - Retained	-0.146		-0.303				-0.319
in Hardwood Products (Mt CO2e/y)							
Business-as-usual carbon sink - Total (Mt	-6.9		0.204				-0.174
CO2e/y)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Low - Accelerate							-74.7
regeneration (1000 tCO2e/y)							
Carbon sink potential - Low - Avoid							-283
deforestation (1000 tCO2e/y)							
Carbon sink potential - Low - Extend							-378
rotation length (1000 tCO2e/y)							
Carbon sink potential - Low - Improve							-22.8
plantations (1000 tCO2e/y)							
Carbon sink potential - Low - Increase							-179
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - Low - Increase							-1,263
trees outside forests (1000 tCO2e/y)							
Carbon sink potential - Low - Reforest							-13,386
cropland (1000 tCO2e/y)							
Carbon sink potential - Low - Reforest							-503
pasture (1000 tCO2e/y)							
Carbon sink potential - Low - Restore							-227
productivity (1000 tCO2e/y)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink notential - Low - All (not	2020	2020	2000	2000	2040	2040	
cal bolt sink potential - Low - All (not coupting evenler) (1000 $\pm$ CO2e(y)							-10,510
							110
Carbon sink potential - Mid - Accelerate							-112
regeneration (1000 tC02e/y)							
Carbon sink potential - Mid - Avoid							-992
deforestation (1000 tCO2e/y)							
Carbon sink potential - Mid - Extend							-680
rotation length (1000 tCO2e/y)							
Carbon sink potential - Mid - Improve							-33.4
plantations (1000 tCO2e/v)							
Carbon sink notential - Mid - Increase							-357
retention of HWP (1000 $t$ CO2e/y)							001
Carbon sink potential Mid Increase							0 / 25
trace outside ferente (1000 ±000 (v)							-2,435
Carbon sink potential - Mid - Reforest							-20,079
cropland (1000 tCO2e/y)							
Carbon sink potential - Mid - Reforest							-3,575
pasture (1000 tCO2e/y)							
Carbon sink potential - Mid - Restore							-451
productivity (1000 tCO2e/y)							
Carbon sink notential - Mid - All (not							-28 714
counting overlap) (1000 tC02e/v)							20,111
Conhan sink notantial High Assolanate							1/.0
Carbon Sink potential - High - Accelerate							-149
regeneration (1000 tC02e/y)							
Carbon sink potential - High - Avoid							-1,700
deforestation (1000 tCO2e/y)							
Carbon sink potential - High - Extend							-983
rotation length (1000 tCO2e/y)							
Carbon sink potential - High - Improve							-44.9
plantations (1000 tCO2e/v)							
Carbon sink notential - High - Increase							-536
retention of HWP ( $1000 \pm 0.02 \text{ eV}$ )							000
Carbon sink notantial High Increase							2 6 0 7
trans sutside ferente (1000 t000s (v)							-3,001
							0/ 770
Carbon sink potential - Hign - Reforest							-26,772
cropland (1000 tCO2e/y)							
Carbon sink potential - High - Reforest							-6,646
pasture (1000 tCO2e/y)							
Carbon sink potential - High - All (not							-41,112
counting overlap) (1000 tCO2e/y)							
Carbon sink potential - High - Restore							-674
nroductivity (1000 tC02e/v)							
Land impacted for carbon sink notential -							12.2
Low Appalents regeneration (1000							12.2
Low - Acceler ale regeneration (1000							
Land impacted for carbon sink potential -							216
Low - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							192
Low - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink notential -							8.26
Low - Improve plantations (1000							
hertares)							
Land impacted for earbon cink potential							
Lanu Impacteu fur Garbuit SIIK putential -							U
LOW - INCREASE RECENTION OF HWP (1000							
neclaresj							
Land impacted for carbon sink potential -							180
Low - Increase trees outside forests							
(1000 hectares)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Land impacted for carbon sink notential -							885
Low - Reforest cronland (1000 bectares)							000
Lond imposted for earlier sink notantial							
							32.7
Low - Reforest pasture (1000 nectares)							
Land impacted for carbon sink potential -							135
Low - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							1,662
Low - Total impacted (over 30 years)							
(1000 hectares)							
Lond imposted for carbon sink notantial							10.0
Mid Appalente reconcretion (1000							10.5
Miu - Accelerate regeneration (1000							
nectaresj							
Land impacted for carbon sink potential -							223
Mid - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							347
Mid - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink notential							12 /
Mid. Improve plantations (1000 besteres)							12.4
Mid - Improve plantations (1000 nectares)							
Land impacted for carbon sink potential -							0
Mid - Increase retention of HWP (1000							
hectares)							
Land impacted for carbon sink potential -							262
Mid - Increase trees outside forests (1000							
hertares)							
Land impacted for carbon sink notantial							1 2 2 0
Mid Defenset appland (1000 bestance)							1,320
Land impacted for carbon sink potential -							237
Mid - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							272
Mid - Restore productivity (1000							
hectares)							
Land impacted for carbon sink notential -							2 699
Mid - Total impacted (over 30 years) (1000							2,077
hactores)							
							0/ /
Land impacted for carbon sink potential -							24.4
High - Accelerate regeneration (1000							
hectares)							
Land impacted for carbon sink potential -							230
High - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink notential -							501
High - Extend rotation length (1000							001
hostores)							
							1/ 5
Land Impacted for carbon sink potential -							16.5
High - Improve plantations (1000							
hectares)							
Land impacted for carbon sink potential -							0
High - Increase retention of HWP (1000							
hectares)							
Land impacted for carbon sink notential -							343
High - Increase trees outside forgets							545
(1000 hostonos)							
Land impacted for carbon sink potential -							1,770
High - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							189
High - Reforest pasture (1000 hectares)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Land impacted for carbon sink potential -							223
High - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							3,297
High - Total impacted (over 30 years)							
(1000 hectares)							