

Net-Zero America - maine state report

2021-03-05

These data underlie graphs and tables presented in the Princeton Net-Zero America study:

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Notes

- These data are all data from the study available at https://netzeroamerica.prince-ton.edu.
- The Net-Zero America study describes five pathways to reach net-zero emissions and one "no new policies" reference scenario. In this document, state-level results are grouped by scenario. For some scenarios, the study generated national, but not statelevel results.
- Within results for a given scenario, data tables are organized into corresponding sections of the full net-zero study (e.g., Pillar 1, Pillar 2, etc.)
- For Pillar 6 (Land sinks), values shown are maximum carbon storage potentials.

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

Item	2020	2025	2030	2035	2040	2045	2050
Commercial HVAC investment in 2020s - Cumulative 5-yr (million \$2018)	0	2,622	2,862	0	0	0	0
Sales of cooking units - Electric Resistance (%)	36.9	49.9	81.2	87.4	87.7	87.7	87.7
Sales of cooking units - Gas (%)	63.1	50.1	18.8	12.6	12.3	12.3	12.3
Sales of space heating units - Electric Heat Pump (%)	2.33	11	39.5	71.3	77.4	77.8	78
Sales of space heating units - Electric Resistance (%)	1.31	4.27	16.7	21.3	22	22.2	22
Sales of space heating units - Fossil (%)	84.1	33.4	6.38	0.27	0	0	0
Sales of space heating units - Gas Furnace (%)	12.2	51.3	37.5	7.1	0.562	0.018	0
Sales of water heating units - Electric Heat Pump (%)	4.05	3.58	15.8	40	45.3	45.8	45.9
Sales of water heating units - Electric Resistance (%)	19.4	12.5	23.7	47.2	52.2	52.5	52.5
Sales of water heating units - Gas Furnace (%)	58.2	78.7	58.4	11.2	0.896	0.03	0
Sales of water heating units - Other (%)	18.4	5.18	2.06	1.6	1.59	1.59	1.61

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

Item	2020	2025	2030	2035	2040	2045	2050
Electricity distribution capital invested -		0.631	0.64	1.22	1.29	1.26	1.32
Cumulative 5-yr (billion \$2018)							

Table 3: E+ scenario - PILLAR 1: Efficiency/Electrification - Overview

Item	2020	2025	2030	2035	2040	2045	2050
Final energy use - Commercial (PJ)	35.3	33	31.4	29.1	26.7	25.2	24.5
Final energy use - Industry (PJ)	90.9	89.1	85.7	82.2	79.8	103	102
Final energy use - Residential (PJ)	77.2	68.5	59.5	49.6	40.9	34.8	31.1
Final energy use - Transportation (PJ)	115	106	92.8	76.3	61.2	51.9	48

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

Item	2020	2025	2030	2035	2040	2045	2050
Residential HVAC investment in 2020s vs.	0	1.25	1.28	0	0	0	0
REF - Cumulative 5-yr (billion \$2018)							
Sales of cooking units - Electric	64.2	71.8	95.2	99.8	100	100	100
Resistance (%)							
Sales of cooking units - Gas (%)	35.8	28.2	4.82	0.243	0	0	0
Sales of space heating units - Electric	3	12.5	61.9	80.8	83.2	83.5	83.4
Heat Pump (%)							
Sales of space heating units - Electric	1.39	1.41	1.15	0.541	0.387	0.388	0.424
Resistance (%)							
Sales of space heating units - Fossil (%)	88.9	82.5	34.4	18.2	16.4	16.1	16.2
Sales of space heating units - Gas (%)	6.74	3.55	2.57	0.511	0.068	0.03	0.029
Sales of water heating units - Electric	0	2.79	18.7	33.9	36.7	36.9	37
Heat Pump (%)							
Sales of water heating units - Electric	25.5	44.1	55.6	61.8	62.9	63	62.9
Resistance (%)							
Sales of water heating units - Gas Furnace	31.8	28.3	20.9	4	0.319	0.011	0
(%)							
Sales of water heating units - Other (%)	42.8	24.8	4.76	0.282	0.088	0.088	0.088

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

Item	2020	2025	2030	2035	2040	2045	2050
Light-duty vehicle capital costs -	0	216	554	896	1,358	1,478	1,409
Cumulative 5-yr (million \$2018)							
Public EV charging plugs - DC Fast (1000	0.118	0	0.513	0	2.24	0	3.63
units)							
Public EV charging plugs - L2 (1000 units)	0.3	0	12.3	0	53.9	0	87.1
Vehicle sales - Heavy-duty - diesel (%)	97.2	92.1	67	23.3	4.22	0.628	0
Vehicle sales - Heavy-duty - EV (%)	0.588	3.81	19	45.6	57.4	59.6	60
Vehicle sales - Heavy-duty - gasoline (%)	0.227	0.227	0.176	0.066	0.013	0.002	0
Vehicle sales - Heavy-duty - hybrid (%)	0.082	0.09	0.077	0.031	0.007	0.001	0
Vehicle sales - Heavy-duty - hydrogen FC	0.392	2.54	12.7	30.4	38.2	39.7	40
(%)							
Vehicle sales - Heavy-duty - other (%)	1.5	1.23	1.07	0.568	0.163	0.038	0
Vehicle sales - Light-duty - diesel (%)	1.67	1.92	1.3	0.419	0.076	0.013	0
Vehicle sales - Light-duty - EV (%)	3.52	14	44.6	81.1	96.2	99.3	100
Vehicle sales - Light-duty - gasoline (%)	90.6	79.4	50.7	17.3	3.39	0.593	0
Vehicle sales - Light-duty - hybrid (%)	4.04	4.26	3.08	1.16	0.279	0.06	0
Vehicle sales - Light-duty - hydrogen FC	0.111	0.346	0.212	0.066	0.013	0.002	0
(%)							
Vehicle sales - Light-duty - other (%)	0.107	0.103	0.069	0.024	0.005	0.001	0
Vehicle sales - Medium-duty - diesel (%)	64.7	59.7	42.3	14.4	2.59	0.384	0
Vehicle sales - Medium-duty - EV (%)	0.784	5.07	25.3	60.8	76.5	79.5	80
Vehicle sales - Medium-duty - gasoline (%)	33.7	33.3	25.5	9.32	1.77	0.277	0
Vehicle sales - Medium-duty - hybrid (%)	0.363	0.402	0.341	0.14	0.03	0.005	0
Vehicle sales - Medium-duty - hydrogen	0.196	1.27	6.33	15.2	19.1	19.9	20
FC (%)							
Vehicle sales - Medium-duty - other (%)	0.253	0.255	0.205	0.083	0.019	0.004	0

Table 6: E+ scenario - PILLAR 2: Clean Electricity - Generating capacity

Item	2020	2025	2030	2035	2040	2045	2050
Capital invested - Biomass power plant	0	0	0.184	0	0	0	0
(billion \$2018)							
Capital invested - Biomass w/ccu allam	0	0	0	0	0	0	0
power plant (billion \$2018)							
Capital invested - Biomass w/ccu power	0	0	0	0	0	0	0
plant (billion \$2018)							
Capital invested - Offshore Wind - Base	0	0	0	0	0	5.07	33.7
(billion \$2018)							
Capital invested - Solar PV - Base (billion	0	0	0	0	0	0	4.17
\$2018)							
Capital invested - Solar PV - Constrained	0	0.114	0	0	0	0.302	5.36
(billion \$2018)							
Capital invested - Wind - Base (billion	0	0	0	0	0	0	0.077
\$2018)							
Capital invested - Wind - Constrained	0	0	0	0	0	0	0
(billion \$2018)							
Installed (cumulative) - OffshoreWind -	0	0	0	0	0	3,098	28,516
Base land use assumptions (MW)							
Installed (cumulative) - Rooftop PV (MW)	86.1	150	176	205	239	277	319
Installed (cumulative) - Solar - Base land	85.4	85.4	85.4	85.4	85.4	85.4	4,582
use assumptions (MW)							
Installed (cumulative) - Wind - Base land	1,011	1,011	1,011	1,011	1,011	1,011	1,052
use assumptions (MW)							

Table 7: E+ scenario - PILLAR 2: Clean Electricity - Generation

Item	2020	2025	2030	2035	2040	2045	2050
Biomass power plant (GWh)	0	0	361	361	361	361	361
Biomass w/ccu allam power plant (GWh)	0	0	0	0	0	0	0
Biomass w/ccu power plant (GWh)	0	0	0	0	0	0	0

Table 7: E+ scenario - PILLAR 2: Clean Electricity - Generation (continued)

Item	2020	2025	2030	2035	2040	2045	2050
OffshoreWind - Base land use	0	0	0	0	0	15,250	127,672
assumptions (GWh)							
OffshoreWind - Constrained land use	0	0	0	0	0	15,250	127,672
assumptions (GWh)							
Solar - Base land use assumptions (GWh)	176	0	0	0	0	0	8,048
Solar - Constrained land use assumptions	176	0	0	953	588	0	5,812
(GWh)							
Wind - Base land use assumptions (GWh)	4,130	0	0	0	0	0	175
Wind - Constrained land use assumptions	4,130	0	0	0	0	0	0
(GWh)							

Table 8: E+ scenario - PILLAR 3: Clean fuels - Bioenergy

2050 126 2,372
_
2,372
0
2
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0
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0

Table 9: E+ scenario - PILLAR 4: CCUS - CO2 capture

Item	2020	2025	2030	2035	2040	2045	2050
Annual - All (MMT)		0	0	0	3.32	3.42	6.58
Annual - BECCS (MMT)		0	0	0	0	0	3.05
Annual - Cement and lime (MMT)		0	0	0	3.32	3.42	3.53
Annual - NGCC (MMT)		0	0	0	0	0	0
Cumulative - All (MMT)		0	0	0	3.32	6.74	13.3
Cumulative - BECCS (MMT)		0	0	0	0	0	3.05
Cumulative - Cement and lime (MMT)		0	0	0	3.32	6.74	10.3
Cumulative - NGCC (MMT)		0	0	0	0	0	0

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

Item	2020	2025	2030	2035	2040	2045	2050
All (km)		0	151	151	267	267	649
Cumulative investment - All (million \$2018)		0	273	273	388	390	623
Cumulative investment - Spur (million \$2018)		0	0	0	115	116	350
Cumulative investment - Trunk (million \$2018)		0	273	273	273	273	273
Spur (km)		0	0	0	116	116	498
Trunk (km)		0	151	151	151	151	151

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

Item	2020	2025	2030	2035	2040	2045	2050
CO2 storage (MMT)		0	0	0	0	0	0
Injection wells (wells)		0	0	0	0	0	0
Resource characterization, appraisal, permitting costs (million \$2020)		0	0	0	0	0	0
Wells and facilities construction costs (million \$2020)		0	0	0	0	0	0

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

Table 12: E+ Scenario - PILLAR 6: Land Sink	2020	2025	2030	2035	2040	2045	2050
Item Carbon sink potential - Aggressive	2020	2025	2030	2035	2040	2045	2050
							U
deployment - Corn-ethanol to energy grasses (1000 tCO2e/y)							
							010
Carbon sink potential - Aggressive							-312
deployment - Cropland measures (1000							
tCO2e/y)							10.1
Carbon sink potential - Aggressive							-10.1
deployment - Permanent conservation							
cover (1000 tC02e/y)							000
Carbon sink potential - Aggressive							-322
deployment - Total (1000 tC02e/y)							
Carbon sink potential - Moderate							0
deployment - Corn-ethanol to energy							
grasses (1000 tC02e/y)							
Carbon sink potential - Moderate							-164
deployment - Cropland measures (1000							
tCO2e/y)							
Carbon sink potential - Moderate							-5.04
deployment - Permanent conservation							
cover (1000 tCO2e/y)							
Carbon sink potential - Moderate							-169
deployment - Total (1000 tCO2e/y)							
Land impacted for carbon sink -							0
Aggressive deployment - Corn-ethanol to							
energy grasses (1000 hectares)							
Land impacted for carbon sink -							173
Aggressive deployment - Cropland							
measures (1000 hectares)							
Land impacted for carbon sink -							18.3
Aggressive deployment - Permanent							
conservation cover (1000 hectares)							
Land impacted for carbon sink -							191
Aggressive deployment - Total (1000							
hectares)							
Land impacted for carbon sink - Moderate							0
deployment - Corn-ethanol to energy							
grasses (1000 hectares)							
Land impacted for carbon sink - Moderate							91.1
deployment - Cropland measures (1000							
hectares)							
Land impacted for carbon sink - Moderate							9.16
deployment - Permanent conservation							2.10
cover (1000 hectares)							
Land impacted for carbon sink - Moderate							100
deployment - Total (1000 hectares)							.00
aspisyment Total (1000 hostal 63)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - High - Accelerate							-107
regeneration (1000 tCO2e/y)							
Carbon sink potential - High - All (not							-26,905
counting overlap) (1000 tCO2e/y)							
Carbon sink potential - High - Avoid							-538
deforestation (1000 tC02e/y)							10.500
Carbon sink potential - High - Extend							-10,590
rotation length (1000 tCO2e/y)							000
Carbon sink potential - High - Improve							-309
plantations (1000 tC02e/y) Carbon sink potential - High - Increase							-10,909
retention of HWP (1000 tCO2e/y)							-10,909
Carbon sink potential - High - Increase							-133
trees outside forests (1000 tCO2e/y)							-100
Carbon sink potential - High - Reforest							-401
cropland (1000 tCO2e/y)							401
Carbon sink potential - High - Reforest							-373
pasture (1000 tC02e/y)							0.0
Carbon sink potential - High - Restore							-3,545
productivity (1000 tCO2e/y)							.,-
Carbon sink potential - Low - Accelerate							-53.7
regeneration (1000 tCO2e/y)							
Carbon sink potential - Low - All (not							-9,475
counting overlap) (1000 tCO2e/y)							
Carbon sink potential - Low - Avoid							-89.7
deforestation (1000 tCO2e/y)							
Carbon sink potential - Low - Extend							-4,068
rotation length (1000 tCO2e/y)							
Carbon sink potential - Low - Improve							-157
plantations (1000 tC02e/y)							
Carbon sink potential - Low - Increase							-3,636
retention of HWP (1000 tC02e/y)							
Carbon sink potential - Low - Increase							-46.4
trees outside forests (1000 tC02e/y)							001
Carbon sink potential - Low - Reforest							-201
cropland (1000 tCO2e/y) Carbon sink potential - Low - Reforest							-28.2
pasture (1000 tC02e/y)							-20.2
							-1,195
carbon sink potential - Low - Restore productivity (1000 tCO2e/y)							-1,170
Carbon sink potential - Mid - Accelerate							-80.5
regeneration (1000 tCO2e/y)							00.0
Carbon sink potential - Mid - All (not							-18,187
counting overlap) (1000 tC02e/y)							10,101
Carbon sink potential - Mid - Avoid							-314
deforestation (1000 tCO2e/y)							
Carbon sink potential - Mid - Extend							-7,329
rotation length (1000 tCO2e/y)							•
Carbon sink potential - Mid - Improve							-230
plantations (1000 tCO2e/y)							
Carbon sink potential - Mid - Increase							-7,273
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - Mid - Increase							-89.4
trees outside forests (1000 tCO2e/y)							
Carbon sink potential - Mid - Reforest							-301
cropland (1000 tCO2e/y)							
Carbon sink potential - Mid - Reforest							-200
pasture (1000 tCO2e/y)							
Carbon sink potential - Mid - Restore							-2,370
productivity (1000 tCO2e/y)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Land impacted for carbon sink potential -							17.5
High - Accelerate regeneration (1000							
hectares)							
Land impacted for carbon sink potential -							72.9
High - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							5,400
High - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							114
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 -							12.6
High - Increase trees outside forests							
(1000 hectares)							
Land impacted for carbon sink potential -							26.5
High - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							10.6
High - Reforest pasture (1000 hectares)							10.0
Land impacted for carbon sink potential -		+				+	1,175
High - Restore productivity (1000							1,110
hectares)							
Land impacted for carbon sink potential -		+					6,829
High - Total impacted (over 30 years)							0,027
(1000 hectares)							
Land impacted for carbon sink potential -		+	-				8.77
Low - Accelerate regeneration (1000							0.11
hectares)							
Land impacted for carbon sink potential -							68.4
Low - Avoid deforestation (over 30 years)							00.4
(1000 hectares)							
Land impacted for carbon sink potential -							2,069
Low - Extend rotation length (1000							2,009
• •							
hectares)							F/ 0
Land impacted for carbon sink potential -							56.9
Low - Improve plantations (1000							
hectares)							
Land impacted for carbon sink potential -							0
Low - Increase retention of HWP (1000							
hectares)							
Land impacted for carbon sink potential -							6.63
Low - Increase trees outside forests							
(1000 hectares)							
Land impacted for carbon sink potential -							13.3
Low - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							1.84
Low - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							711
Low - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							2,936
Low - Total impacted (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							13.2
Mid - Accelerate regeneration (1000							
hectares)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Land impacted for carbon sink potential -							70.6
Mid - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							3,734
Mid - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							85.7
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 -							9.61
Mid - Increase trees outside forests (1000							
hectares)							
Land impacted for carbon sink potential -							19.9
Mid - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							13.3
Mid - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							1,432
Mid - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							5,379
Mid - Total impacted (over 30 years) (1000							
hectares)							

Table 14: E+ scenario - IMPACTS - Fossil fuel industries

Item	2020	2025	2030	2035	2040	2045	2050
Natural gas consumption - Annual (tcf)		36	30.3	24.3	18.3	11.5	7.99
Natural gas consumption - Cumulative (tcf)		0	0	0	0	0	732
Natural gas production - Annual (tcf)		0	0	0	0	0	0
Oil consumption - Annual (million bbls)		42	37.9	31.3	24.9	19.9	15.7
Oil consumption - Cumulative (million bbls)		0	0	0	0	0	956
Oil production - Annual (million bbls)		0	0	0	0	0	0

Table 15: E+ scenario - IMPACTS - Health

Item	2020	2025	2030	2035	2040	2045	2050
Monetary damages from air pollution - Coal (million 2019\$)		124	0.147	0.146	0.14	0.083	0.004
Monetary damages from air pollution - Natural Gas (million 2019\$)		35.1	19.8	12.6	11.6	7.15	3.33
Monetary damages from air pollution - Transportation (million 2019\$)		163	149	111	62.7	27.6	10.1
Premature deaths from air pollution - Coal (deaths)		14	0.017	0.017	0.016	0.009	0
Premature deaths from air pollution - Natural Gas (deaths)		3.96	2.23	1.42	1.31	0.807	0.376
Premature deaths from air pollution - Transportation (deaths)		18.4	16.8	12.5	7.05	3.11	1.14

Table 16: E+ scenario - IMPACTS - Jobs

Item	2020	2025	2030	2035	2040	2045	2050
By economic sector - Agriculture (jobs)		239	499	219	173	129	249
By economic sector - Construction (jobs)		1,355	1,129	1,060	1,250	3,284	25,058
By economic sector - Manufacturing		1,081	1,609	1,419	1,554	2,377	6,655
(jobs)							
By economic sector - Mining (jobs)		648	485	333	220	145	94.3

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

Table 16: E+ Scending - IMPAG13 - Jobs (Co	Jiitiiiueuj						
Item	2020	2025	2030	2035	2040	2045	2050
By economic sector - Other (jobs)		120	82.8	92.9	112	295	2,892
By economic sector - Pipeline (jobs)		98.9	121	72.1	70.3	56.4	70.6
By economic sector - Professional (jobs)		1,236	1,126	763	790	1,963	14,696
By economic sector - Trade (jobs)		771	608	502	491	1,100	8,347
By economic sector - Utilities (jobs)		896	767	786	1,279	3,800	28,080
By education level - All sectors -		1,878	1,835	1,561	1,834	4,211	28,051
Associates degree or some college (jobs)		4 (74	1.000	4.440	1.010	0.440	47.010
By education level - All sectors - Bachelors degree (jobs)		1,471	1,398	1,110	1,218	2,649	17,210
By education level - All sectors - Doctoral		59.8	54.3	38.8	40	90.9	644
degree (jobs)		39.0	54.5	30.0	40	90.9	044
By education level - All sectors - High		2,670	2,798	2,275	2,560	5,544	35,775
school diploma or less (jobs)		2,010	2,170	2,213	2,300	3,344	33,113
By education level - All sectors - Masters		366	341	263	288	655	4,462
or professional degree (jobs)		300	341	203	200	000	4,402
By resource sector - Biomass (jobs)		1,028	1,375	623	520	472	1,063
By resource sector - CO2 (jobs)		0	272	0	112	111	313
By resource sector - Grid (jobs)		1,095	853	1,349	1,965	7,333	56,654
By resource sector - Natural Gas (jobs)		701	421	242	523	296	262
By resource sector - Nuclear (jobs)		0	0	0	0	0	0
By resource sector - Oil (jobs)		1,867	1,546	1,179	872	650	481
By resource sector - Solar (jobs)		985	948	666	878	1,418	6,882
By resource sector - Wind (jobs)		769	1,012	1,188	1,071	2,870	20,488
Median wages - Annual - All (\$2019 per		57,717	57,407	57,892	58,493	59,594	60,830
job)		31,111	31,401	31,072	30,473	37,374	00,000
On-Site or In-Plant Training - Total jobs - 1		984	959	811	945	2,166	14,470
to 4 years (jobs)		704	,0,	011	740	2,100	14,410
On-Site or In-Plant Training - Total jobs - 4		392	356	305	366	894	6,362
to 10 years (jobs)		0,2				0,1	0,002
On-Site or In-Plant Training - Total jobs -		1,076	1,080	864	966	2,107	13,716
None (jobs)		,,,,,,	,,,,,,			_,	,
On-Site or In-Plant Training - Total jobs -		48.8	47	40.8	49.5	118	807
Over 10 years (jobs)							
On-Site or In-Plant Training - Total jobs -		3,944	3,985	3,226	3,613	7,864	50,787
Up to 1 year (jobs)							
On-the-Job Training - All sectors - 1 to 4		1,251	1,208	1,027	1,207	2,796	18,808
years (jobs)							
On-the-Job Training - All sectors - 4 to 10		371	335	290	354	884	6,380
years (jobs)							
On-the-Job Training - All sectors - None		366	353	285	314	683	4,496
(jobs)							
On-the-Job Training - All sectors - Over 10		60.4	60.5	51.4	57.8	122	751
years (jobs)							
On-the-Job Training - All sectors - Up to 1		4,396	4,470	3,594	4,008	8,666	55,708
year (jobs)							
Related work experience - All sectors - 1		2,351	2,323	1,890	2,132	4,726	31,063
to 4 years (jobs)							
Related work experience - All sectors - 4		1,479	1,425	1,182	1,357	3,072	20,371
to 10 years (jobs)							
Related work experience - All sectors -		913	925	753	860	1,903	12,539
None (jobs)							
Related work experience - All sectors -		394	387	325	371	820	5,254
Over 10 years (jobs)		1000	1011	1007	4.040	0.700	1/ 01/
Related work experience - All sectors - Up		1,308	1,366	1,096	1,219	2,629	16,916
to 1 year (jobs)		070	0/0	007	0.7	707	F 0/1
Wage income - All (million \$2019)		372	369	304	347	784	5,241

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

Item	2020	2025	2030	2035	2040	2045	2050
Commercial HVAC investment in 2020s -	0	2,622	2,866	0	0	0	0
Cumulative 5-yr (million \$2018)							
Sales of cooking units - Electric	36.9	40.7	44.7	56.5	72.7	82.9	86.4
Resistance (%)							
Sales of cooking units - Gas (%)	63.1	59.3	55.3	43.5	27.3	17.1	13.6
Sales of space heating units - Electric	2.33	6.89	8.48	13.3	22.8	32.7	38.1
Heat Pump (%)							
Sales of space heating units - Electric	1.31	1.76	2.43	4.48	7.93	10.5	11.3
Resistance (%)							
Sales of space heating units - Fossil (%)	84.1	39.2	38.1	33.9	26.8	22.3	21
Sales of space heating units - Gas Furnace	12.2	52.1	51	48.4	42.5	34.6	29.5
(%)							
Sales of water heating units - Electric	4.05	2.68	3.38	5.63	11.1	17.9	22
Heat Pump (%)							
Sales of water heating units - Electric	19.4	11.6	11.9	14.5	19.6	26	29.9
Resistance (%)							
Sales of water heating units - Gas Furnace	58.2	79.9	79.4	75.1	65.2	52.6	44.8
(%)							
Sales of water heating units - Other (%)	18.4	5.77	5.34	4.75	4.17	3.55	3.28

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

Item	2020	2025	2030	2035	2040	2045	2050
Electricity distribution capital invested -		0.484	0.475	0.654	0.668	1.11	1.17
Cumulative 5-yr (billion \$2018)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Final energy use - Commercial (PJ)	35.3	33	32	31	30	29	28.3
Final energy use - Industry (PJ)	90.9	89.2	86.1	83	81.1	104	103
Final energy use - Residential (PJ)	77.2	68.8	62.6	57.4	52.4	47.4	42.8
Final energy use - Transportation (PJ)	115	107	97.2	89.2	82.9	75.5	66.9

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

Item	2020	2025	2030	2035	2040	2045	2050
Residential HVAC investment in 2020s vs.	0	1.25	1.38	0	0	0	0
REF - Cumulative 5-yr (billion \$2018)							
Sales of cooking units - Electric	64.1	65	68.3	77	89	96.5	99
Resistance (%)							
Sales of cooking units - Gas (%)	35.9	35	31.7	23	11	3.54	0.953
Sales of space heating units - Electric	3	2.62	5.43	13.6	26.9	36.8	40.8
Heat Pump (%)							
Sales of space heating units - Electric	1.39	1.43	1.43	1.44	1.28	1.11	1.03
Resistance (%)							
Sales of space heating units - Fossil (%)	88.9	92.3	89.6	81.5	68.9	59.6	56.1
Sales of space heating units - Gas (%)	6.74	3.62	3.58	3.39	2.96	2.45	2.07
Sales of water heating units - Electric	0	0.324	1.24	4.01	9.3	14.5	17.2
Heat Pump (%)							
Sales of water heating units - Electric	25.5	41.9	42.4	44.6	47.8	50.5	51.8
Resistance (%)							
Sales of water heating units - Gas Furnace	31.8	28.7	28.4	26.9	23.4	18.8	16
(%)							
Sales of water heating units - Other (%)	42.8	29.1	28	24.5	19.5	16.2	15

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

Item	2020	2025	2030	2035	2040	2045	2050
Light-duty vehicle capital costs -	0	0	35	73.4	248	780	1,136
Cumulative 5-yr (million \$2018)							
Public EV charging plugs - DC Fast (1000	0.118	0	0.159	0	0.833	0	2.32
units)							
Public EV charging plugs - L2 (1000 units)	0.3	0	3.82	0	20	0	55.8
Vehicle sales - Heavy-duty - diesel (%)	97.4	96	91.3	79.8	58.2	32.1	13.7
Vehicle sales - Heavy-duty - EV (%)	0.498	1.45	4.11	10.8	23.6	39.5	51
Vehicle sales - Heavy-duty - gasoline (%)	0.228	0.236	0.239	0.225	0.179	0.109	0.051
Vehicle sales - Heavy-duty - hybrid (%)	0.083	0.094	0.104	0.107	0.092	0.06	0.03
Vehicle sales - Heavy-duty - hydrogen FC	0.332	0.969	2.74	7.17	15.7	26.3	34
(%)							
Vehicle sales - Heavy-duty - other (%)	1.5	1.28	1.46	1.95	2.25	1.96	1.14
Vehicle sales - Light-duty - diesel (%)	1.68	2.07	2.08	1.66	1.07	0.552	0.236
Vehicle sales - Light-duty - EV (%)	1.75	4.38	11.2	24.8	47.3	71.3	87.3
Vehicle sales - Light-duty - gasoline (%)	92.2	88.1	80.6	67.9	47.5	25.6	11.3
Vehicle sales - Light-duty - hybrid (%)	4.18	5.01	5.66	5.21	3.96	2.37	1.16
Vehicle sales - Light-duty - hydrogen FC	0.113	0.384	0.333	0.257	0.184	0.103	0.048
(%)							
Vehicle sales - Light-duty - other (%)	0.108	0.111	0.102	0.089	0.065	0.036	0.016
Vehicle sales - Medium-duty - diesel (%)	64.8	62.2	57.7	49.4	35.6	19.6	8.37
Vehicle sales - Medium-duty - EV (%)	0.664	1.94	5.49	14.3	31.4	52.6	68
Vehicle sales - Medium-duty - gasoline (%)	33.8	34.7	34.7	31.9	24.4	14.2	6.33
Vehicle sales - Medium-duty - hybrid (%)	0.363	0.418	0.464	0.478	0.414	0.275	0.141
Vehicle sales - Medium-duty - hydrogen	0.166	0.485	1.37	3.58	7.86	13.2	17
FC (%)							
Vehicle sales - Medium-duty - other (%)	0.253	0.266	0.279	0.286	0.258	0.184	0.102

Table 22: E- scenario - PILLAR 6: Land sinks - Agriculture

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Aggressive							0
deployment - Corn-ethanol to energy							
grasses (1000 tCO2e/y)							
Carbon sink potential - Aggressive							-312
deployment - Cropland measures (1000							
tCO2e/y)							
Carbon sink potential - Aggressive							-10.1
deployment - Permanent conservation							
cover (1000 tCO2e/y)							
Carbon sink potential - Aggressive							-322
deployment - Total (1000 tCO2e/y)							
Carbon sink potential - Moderate							0
deployment - Corn-ethanol to energy							
grasses (1000 tCO2e/y)							
Carbon sink potential - Moderate							-164
deployment - Cropland measures (1000							
tCO2e/y)							
Carbon sink potential - Moderate							-5.04
deployment - Permanent conservation							
cover (1000 tCO2e/y)							
Carbon sink potential - Moderate							-169
deployment - Total (1000 tCO2e/y)							
Land impacted for carbon sink -							0
Aggressive deployment - Corn-ethanol to							
energy grasses (1000 hectares)							
Land impacted for carbon sink -							173
Aggressive deployment - Cropland							
measures (1000 hectares)							
Land impacted for carbon sink -							18.3
Aggressive deployment - Permanent							
conservation cover (1000 hectares)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Land impacted for carbon sink -							191
Aggressive deployment - Total (1000							
hectares)							
Land impacted for carbon sink - Moderate							0
deployment - Corn-ethanol to energy							
grasses (1000 hectares)							
Land impacted for carbon sink - Moderate							91.1
deployment - Cropland measures (1000							
hectares)							
Land impacted for carbon sink - Moderate							9.16
deployment - Permanent conservation							
cover (1000 hectares)							
Land impacted for carbon sink - Moderate							100
deployment - Total (1000 hectares)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - High - Accelerate							-107
regeneration (1000 tCO2e/y)							
Carbon sink potential - High - All (not							-26,905
counting overlap) (1000 tCO2e/y)							
Carbon sink potential - High - Avoid							-538
deforestation (1000 tCO2e/y)							
Carbon sink potential - High - Extend							-10,590
rotation length (1000 tCO2e/y)							
Carbon sink potential - High - Improve							-309
plantations (1000 tCO2e/y)							
Carbon sink potential - High - Increase							-10,909
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - High - Increase							-133
trees outside forests (1000 tCO2e/y)							
Carbon sink potential - High - Reforest							-401
cropland (1000 tCO2e/y)							
Carbon sink potential - High - Reforest							-373
pasture (1000 tC02e/y)							
Carbon sink potential - High - Restore							-3,545
productivity (1000 tCO2e/y)							
Carbon sink potential - Low - Accelerate							-53.7
regeneration (1000 tC02e/y)							
Carbon sink potential - Low - All (not							-9,475
counting overlap) (1000 tCO2e/y)							
Carbon sink potential - Low - Avoid							-89.7
deforestation (1000 tCO2e/y)							
Carbon sink potential - Low - Extend							-4,068
rotation length (1000 tCO2e/y)							
Carbon sink potential - Low - Improve							-157
plantations (1000 tCO2e/y)							
Carbon sink potential - Low - Increase							-3,636
retention of HWP (1000 tC02e/y)							•
Carbon sink potential - Low - Increase							-46.4
trees outside forests (1000 tC02e/y)							
Carbon sink potential - Low - Reforest							-201
cropland (1000 tCO2e/y)							
Carbon sink potential - Low - Reforest							-28.2
pasture (1000 tC02e/y)							
Carbon sink potential - Low - Restore					+		-1,195
productivity (1000 tCO2e/y)							.,.,0
Carbon sink potential - Mid - Accelerate							-80.5
regeneration (1000 tCO2e/y)							23.0

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

Item Carbon sink potential - Mid - All (not	2020	2025	2030	2035	2040	2045	2050 -18,187
counting overlap) (1000 tCO2e/y)							.0,.0.
Carbon sink potential - Mid - Avoid							-314
deforestation (1000 tCO2e/y)							
Carbon sink potential - Mid - Extend							-7,329
rotation length (1000 tCO2e/y) Carbon sink potential - Mid - Improve							-230
plantations (1000 tCO2e/y)							-230
Carbon sink potential - Mid - Increase							-7,273
retention of HWP (1000 tCO2e/y)							1,210
Carbon sink potential - Mid - Increase							-89.4
trees outside forests (1000 tCO2e/y)							
Carbon sink potential - Mid - Reforest							-301
cropland (1000 tCO2e/y)							
Carbon sink potential - Mid - Reforest							-200
pasture (1000 tC02e/y)							0.070
Carbon sink potential - Mid - Restore							-2,370
productivity (1000 tC02e/y) Land impacted for carbon sink potential -							17.5
High - Accelerate regeneration (1000							11.5
hectares)							
Land impacted for carbon sink potential -							72.9
High - Avoid deforestation (over 30 years)							. 2.7
(1000 hectares)							
Land impacted for carbon sink potential -							5,400
High - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							114
High - Improve plantations (1000							
hectares)							
Land impacted for carbon sink potential - High - Increase retention of HWP (1000							0
hectares)							
Land impacted for carbon sink potential -							12.6
High - Increase trees outside forests							12.0
(1000 hectares)							
Land impacted for carbon sink potential -							26.5
High - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							10.6
High - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							1,175
High - Restore productivity (1000							
hectares)							/ 000
Land impacted for carbon sink potential - High - Total impacted (over 30 years)							6,829
(1000 hectares)							
Land impacted for carbon sink potential -							8.77
Low - Accelerate regeneration (1000							0.11
hectares)							
Land impacted for carbon sink potential -							68.4
Low - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							2,069
Low - Extend rotation length (1000							
hectares)							F / C
Land impacted for carbon sink potential -							56.9
Low - Improve plantations (1000							
hectares) Land impacted for carbon sink potential -							0
Low - Increase retention of HWP (1000							U
hectares)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Land impacted for carbon sink potential -							6.63
Low - Increase trees outside forests							
(1000 hectares)							
Land impacted for carbon sink potential -							13.3
Low - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							1.84
Low - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							711
Low - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							2,936
Low - Total impacted (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							13.2
Mid - Accelerate regeneration (1000							
hectares)							
Land impacted for carbon sink potential -							70.6
Mid - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							3,734
Mid - Extend rotation length (1000							·
hectares)							
Land impacted for carbon sink potential -							85.7
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 -							9.61
Mid - Increase trees outside forests (1000							
hectares)							
Land impacted for carbon sink potential -							19.9
Mid - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							13.3
Mid - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							1,432
Mid - Restore productivity (1000							.,
hectares)							
Land impacted for carbon sink potential -						+	5,379
Mid - Total impacted (over 30 years) (1000							-/
hectares)							

Table 24: E- scenario - IMPACTS - Health

2020	2025	2030	2035	2040	2045	2050
	124	0.147	0.146	0.14	0.083	0.004
	34.2	16.1	6.12	2.58	0.799	0.888
	166	164	156	138	107	71.8
	14	0.017	0.017	0.016	0.009	0
	3.86	1.81	0.691	0.292	0.09	0.1
	18.7	18.5	17.6	15.5	12.1	8.08
	2020	124 34.2 166 14 3.86	124 0.147 34.2 16.1 166 164 14 0.017 3.86 1.81	124 0.147 0.146 34.2 16.1 6.12 166 164 156 14 0.017 0.017 3.86 1.81 0.691	124 0.147 0.146 0.14 34.2 16.1 6.12 2.58 166 164 156 138 14 0.017 0.017 0.016 3.86 1.81 0.691 0.292	124 0.147 0.146 0.14 0.083 34.2 16.1 6.12 2.58 0.799 166 164 156 138 107 14 0.017 0.017 0.016 0.009 3.86 1.81 0.691 0.292 0.09

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

Item	2020	2025	2030	2035	2040	2045	2050
Commercial HVAC investment in 2020s - Cumulative 5-yr (million \$2018)	0	2,622	2,862	0	0	0	0
Sales of cooking units - Electric Resistance (%)	36.9	49.9	81.2	87.4	87.7	87.7	87.7
Sales of cooking units - Gas (%)	63.1	50.1	18.8	12.6	12.3	12.3	12.3
Sales of space heating units - Electric Heat Pump (%)	2.33	11	39.5	71.3	77.4	77.8	78
Sales of space heating units - Electric Resistance (%)	1.31	4.27	16.7	21.3	22	22.2	22
Sales of space heating units - Fossil (%)	84.1	33.4	6.38	0.27	0	0	0
Sales of space heating units - Gas Furnace (%)	12.2	51.3	37.5	7.1	0.562	0.018	0
Sales of water heating units - Electric Heat Pump (%)	4.05	3.58	15.8	40	45.3	45.8	45.9
Sales of water heating units - Electric Resistance (%)	19.4	12.5	23.7	47.2	52.2	52.5	52.5
Sales of water heating units - Gas Furnace (%)	58.2	78.7	58.4	11.2	0.896	0.03	0
Sales of water heating units - Other (%)	18.4	5.18	2.06	1.6	1.59	1.59	1.61

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

Item	2020	2025	2030	2035	2040	2045	2050
Electricity distribution capital invested -		0.631	0.64	1.22	1.29	1.26	1.32
Cumulative 5-yr (billion \$2018)							

Table 27: E+RE+ scenario - PILLAR 1: Efficiency/Electrification - Overview

Item	2020	2025	2030	2035	2040	2045	2050
Final energy use - Commercial (PJ)	35.3	33	31.4	29.1	26.7	25.2	24.5
Final energy use - Industry (PJ)	90.9	89.1	85.7	82.2	79.8	103	102
Final energy use - Residential (PJ)	77.2	68.5	59.5	49.6	40.9	34.8	31.1
Final energy use - Transportation (PJ)	115	106	92.8	76.3	61.2	51.9	48

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

Item	2020	2025	2030	2035	2040	2045	2050
Residential HVAC investment in 2020s vs.	0	1.25	1.28	0	0	0	0
REF - Cumulative 5-yr (billion \$2018)							
Sales of cooking units - Electric	64.2	71.8	95.2	99.8	100	100	100
Resistance (%)							
Sales of cooking units - Gas (%)	35.8	28.2	4.82	0.243	0	0	0
Sales of space heating units - Electric	3	12.5	61.9	80.8	83.2	83.5	83.4
Heat Pump (%)							
Sales of space heating units - Electric	1.39	1.41	1.15	0.541	0.387	0.388	0.424
Resistance (%)							
Sales of space heating units - Fossil (%)	88.9	82.5	34.4	18.2	16.4	16.1	16.2
Sales of space heating units - Gas (%)	6.74	3.55	2.57	0.511	0.068	0.03	0.029
Sales of water heating units - Electric	0	2.79	18.7	33.9	36.7	36.9	37
Heat Pump (%)							
Sales of water heating units - Electric	25.5	44.1	55.6	61.8	62.9	63	62.9
Resistance (%)							
Sales of water heating units - Gas Furnace	31.8	28.3	20.9	4	0.319	0.011	0
(%)							
Sales of water heating units - Other (%)	42.8	24.8	4.76	0.282	0.088	0.088	0.088

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

Item	2020	2025	2030	2035	2040	2045	2050
Light-duty vehicle capital costs -	0	216	554	896	1,358	1,478	1,409
Cumulative 5-yr (million \$2018)							
Public EV charging plugs - DC Fast (1000	0.118	0	0.513	0	2.24	0	3.63
units)							
Public EV charging plugs - L2 (1000 units)	0.3	0	12.3	0	53.9	0	87.1
Vehicle sales - Heavy-duty - diesel (%)	97.2	92.1	67	23.3	4.22	0.628	0
Vehicle sales - Heavy-duty - EV (%)	0.588	3.81	19	45.6	57.4	59.6	60
Vehicle sales - Heavy-duty - gasoline (%)	0.227	0.227	0.176	0.066	0.013	0.002	0
Vehicle sales - Heavy-duty - hybrid (%)	0.082	0.09	0.077	0.031	0.007	0.001	0
Vehicle sales - Heavy-duty - hydrogen FC	0.392	2.54	12.7	30.4	38.2	39.7	40
(%)							
Vehicle sales - Heavy-duty - other (%)	1.5	1.23	1.07	0.568	0.163	0.038	0
Vehicle sales - Light-duty - diesel (%)	1.67	1.92	1.3	0.419	0.076	0.013	0
Vehicle sales - Light-duty - EV (%)	3.52	14	44.6	81.1	96.2	99.3	100
Vehicle sales - Light-duty - gasoline (%)	90.6	79.4	50.7	17.3	3.39	0.593	0
Vehicle sales - Light-duty - hybrid (%)	4.04	4.26	3.08	1.16	0.279	0.06	0
Vehicle sales - Light-duty - hydrogen FC	0.111	0.346	0.212	0.066	0.013	0.002	0
(%)							
Vehicle sales - Light-duty - other (%)	0.107	0.103	0.069	0.024	0.005	0.001	0
Vehicle sales - Medium-duty - diesel (%)	64.7	59.7	42.3	14.4	2.59	0.384	0
Vehicle sales - Medium-duty - EV (%)	0.784	5.07	25.3	60.8	76.5	79.5	80
Vehicle sales - Medium-duty - gasoline (%)	33.7	33.3	25.5	9.32	1.77	0.277	0
Vehicle sales - Medium-duty - hybrid (%)	0.363	0.402	0.341	0.14	0.03	0.005	0
Vehicle sales - Medium-duty - hydrogen	0.196	1.27	6.33	15.2	19.1	19.9	20
FC (%)							
Vehicle sales - Medium-duty - other (%)	0.253	0.255	0.205	0.083	0.019	0.004	0

Table 30: E+RE+ scenario - PILLAR 2: Clean Electricity - Generating capacity

Item	2020	2025	2030	2035	2040	2045	2050
Capital invested - Offshore Wind - Base	0	0	0	0	0.583	20.6	44.7
(billion \$2018)							
Capital invested - Solar PV - Base (billion	0	0	0	0.434	0.33	3.49	8.83
\$2018)							
Capital invested - Wind - Base (billion	0	0	0	0	0	0	0.077
\$2018)							
Installed (cumulative) - OffshoreWind -	0	0	0	0	288	12,884	46,590
Base land use assumptions (MW)							
Installed (cumulative) - Solar - Base land	85.4	85.4	85.4	479	796	4,351	13,882
use assumptions (MW)							
Installed (cumulative) - Wind - Base land	1,011	1,011	1,011	1,011	1,011	1,011	1,052
use assumptions (MW)							

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

Item	2020	2025	2030	2035	2040	2045	2050
OffshoreWind - Base land use	0			0	1,440	62,717	170,052
assumptions (GWh)							
OffshoreWind - Constrained land use	0			0	0	0	256,402
assumptions (GWh)							
Solar - Base land use assumptions (GWh)	176			712	570	6,318	16,676
Solar - Constrained land use assumptions	176			0	570	7,514	16,795
(GWh)							
Wind - Base land use assumptions (GWh)	4,130			0	0	0	175
Wind - Constrained land use assumptions	4,130			0	0	0	0
(GWh)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Aggressive							0
deployment - Corn-ethanol to energy							
grasses (1000 tCO2e/y)							
Carbon sink potential - Aggressive							-312
deployment - Cropland measures (1000							
tCO2e/y)							
Carbon sink potential - Aggressive							-10.1
deployment - Permanent conservation							
cover (1000 tC02e/y)							
Carbon sink potential - Aggressive							-322
deployment - Total (1000 tCO2e/y)							
Carbon sink potential - Moderate							0
deployment - Corn-ethanol to energy							
grasses (1000 tCO2e/y)							
Carbon sink potential - Moderate							-164
deployment - Cropland measures (1000							
tCO2e/y)							
Carbon sink potential - Moderate							-5.04
deployment - Permanent conservation							
cover (1000 tCO2e/y)							
Carbon sink potential - Moderate							-169
deployment - Total (1000 tC02e/y)							
Land impacted for carbon sink -							0
Aggressive deployment - Corn-ethanol to							
energy grasses (1000 hectares)							
Land impacted for carbon sink -							173
Aggressive deployment - Cropland							
measures (1000 hectares)							
Land impacted for carbon sink -							18.3
Aggressive deployment - Permanent							
conservation cover (1000 hectares)							
Land impacted for carbon sink -							191
Aggressive deployment - Total (1000							
hectares)							
Land impacted for carbon sink - Moderate							0
deployment - Corn-ethanol to energy							·
grasses (1000 hectares)							
Land impacted for carbon sink - Moderate							91.1
deployment - Cropland measures (1000							71.1
hectares)							
Land impacted for carbon sink - Moderate							9.16
deployment - Permanent conservation							7.10
cover (1000 hectares)							
Land impacted for carbon sink - Moderate							100
deployment - Total (1000 hectares)							100
deproyment - rotar (1000 nectares)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - High - Accelerate							-107
regeneration (1000 tCO2e/y)							
Carbon sink potential - High - All (not							-26,905
counting overlap) (1000 tCO2e/y)							
Carbon sink potential - High - Avoid							-538
deforestation (1000 tCO2e/y)							
Carbon sink potential - High - Extend							-10,590
rotation length (1000 tCO2e/y)							
Carbon sink potential - High - Improve							-309
plantations (1000 tCO2e/y)							
Carbon sink potential - High - Increase							-10,909
retention of HWP (1000 tCO2e/y)							

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

Item Conhon sink notantial High Increase	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - High - Increase							-133
trees outside forests (1000 tC02e/y)							/ 0
Carbon sink potential - High - Reforest cropland (1000 tCO2e/y)							-40
Carbon sink potential - High - Reforest pasture (1000 tCO2e/y)							-373
Carbon sink potential - High - Restore productivity (1000 tCO2e/y)							-3,545
Carbon sink potential - Low - Accelerate regeneration (1000 tC02e/y)							-53.7
Carbon sink potential - Low - All (not counting overlap) (1000 tCO2e/y)							-9,475
Carbon sink potential - Low - Avoid deforestation (1000 tC02e/y)							-89.
Carbon sink potential - Low - Extend rotation length (1000 tCO2e/y)							-4,068
Carbon sink potential - Low - Improve plantations (1000 tCO2e/y)							-15 ⁻
Carbon sink potential - Low - Increase retention of HWP (1000 tCO2e/y)							-3,63
Carbon sink potential - Low - Increase trees outside forests (1000 tC02e/y)							-46.4
Carbon sink potential - Low - Reforest cropland (1000 tCO2e/y)							-20
Carbon sink potential - Low - Reforest pasture (1000 tC02e/y)							-28.
Carbon sink potential - Low - Restore productivity (1000 tCO2e/y)							-1,19
Carbon sink potential - Mid - Accelerate regeneration (1000 tCO2e/y)							-80.
Carbon sink potential - Mid - All (not counting overlap) (1000 tCO2e/y)							-18,18
Carbon sink potential - Mid - Avoid deforestation (1000 tCO2e/y)							-314
Carbon sink potential - Mid - Extend rotation length (1000 tCO2e/y)							-7,32
Carbon sink potential - Mid - Improve plantations (1000 tCO2e/y)							-23
Carbon sink potential - Mid - Increase retention of HWP (1000 tC02e/y)							-7,27
Carbon sink potential - Mid - Increase trees outside forests (1000 tCO2e/y)							-89.
Carbon sink potential - Mid - Reforest cropland (1000 tCO2e/y)							-30
Carbon sink potential - Mid - Reforest pasture (1000 tCO2e/y)							-20
Carbon sink potential - Mid - Restore productivity (1000 tCO2e/y)							-2,37
Land impacted for carbon sink potential - High - Accelerate regeneration (1000 hectares)							17.
Land impacted for carbon sink potential - High - Avoid deforestation (over 30 years)							72.
(1000 hectares) Land impacted for carbon sink potential - High - Extend rotation length (1000							5,40
hectares) Land impacted for carbon sink potential - High - Improve plantations (1000 hectares)							11

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

Item	2020	2025	2030	2035	2040	2045	2050
Land impacted for carbon sink potential - High - Increase retention of HWP (1000							0
hectares)							
Land impacted for carbon sink potential -							12.6
High - Increase trees outside forests							
(1000 hectares)							
Land impacted for carbon sink potential -							26.5
High - Reforest cropland (1000 hectares)							10 /
Land impacted for carbon sink potential -							10.6
High - Reforest pasture (1000 hectares) Land impacted for carbon sink potential -							1,175
High - Restore productivity (1000							1,175
hectares)							
Land impacted for carbon sink potential -							6,829
High - Total impacted (over 30 years)							0,027
(1000 hectares)							
Land impacted for carbon sink potential -							8.77
Low - Accelerate regeneration (1000							
hectares)							
Land impacted for carbon sink potential -							68.4
Low - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							2,069
Low - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							56.9
Low - Improve plantations (1000							
hectares)							
Land impacted for carbon sink potential -							0
Low - Increase retention of HWP (1000							
hectares)							
Land impacted for carbon sink potential -							6.63
Low - Increase trees outside forests							
(1000 hectares)							13.3
Land impacted for carbon sink potential - Low - Reforest cropland (1000 hectares)							13.3
Land impacted for carbon sink potential -							1.84
Low - Reforest pasture (1000 hectares)							1.04
Land impacted for carbon sink potential -							711
Low - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							2,936
Low - Total impacted (over 30 years)							,
(1000 hectares)							
Land impacted for carbon sink potential -							13.2
Mid - Accelerate regeneration (1000							
hectares)							
Land impacted for carbon sink potential -							70.6
Mid - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							3,734
Mid - Extend rotation length (1000							
hectares)							0.5.7
Land impacted for carbon sink potential -							85.7
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 -							9.61
Mid - Increase trees outside forests (1000							7.61
mu - mu case mees uutside miests (1000	1	1				1	

Table 33: <i>E+RE+</i>	scenario -	DTII AR 6.	I and sinks -	Forests	(continued)
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Item	2020	2025	2030	2035	2040	2045	2050
Land impacted for carbon sink potential -							19.9
Mid - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							13.3
Mid - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							1,432
Mid - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							5,379
Mid - Total impacted (over 30 years) (1000							
hectares)							

Table 34: E+RE+ scenario - IMPACTS - Health

Item	2020	2025	2030	2035	2040	2045	2050
Monetary damages from air pollution -		124	0.147	0.146	0.14	0.083	0.004
Coal (million 2019\$)							
Monetary damages from air pollution -		32.6	17.5	9.62	7.52	2.54	0.916
Natural Gas (million 2019\$)							
Monetary damages from air pollution -		163	149	111	62.7	27.6	10.1
Transportation (million 2019\$)							
Premature deaths from air pollution -		14	0.017	0.017	0.016	0.009	0
Coal (deaths)							
Premature deaths from air pollution -		3.68	1.98	1.09	0.848	0.287	0.103
Natural Gas (deaths)							
Premature deaths from air pollution -		18.4	16.8	12.5	7.05	3.11	1.14
Transportation (deaths)							

Table 35: E+RE- scenario - PILLAR 1: Efficiency/Electrification - Commercial

Item	2020	2025	2030	2035	2040	2045	2050
Commercial HVAC investment in 2020s - Cumulative 5-yr (million \$2018)	0	2,622	2,862	0	0	0	0
Sales of cooking units - Electric Resistance (%)	36.9	49.9	81.2	87.4	87.7	87.7	87.7
Sales of cooking units - Gas (%)	63.1	50.1	18.8	12.6	12.3	12.3	12.3
Sales of space heating units - Electric Heat Pump (%)	2.33	11	39.5	71.3	77.4	77.8	78
Sales of space heating units - Electric Resistance (%)	1.31	4.27	16.7	21.3	22	22.2	22
Sales of space heating units - Fossil (%)	84.1	33.4	6.38	0.27	0	0	0
Sales of space heating units - Gas Furnace (%)	12.2	51.3	37.5	7.1	0.562	0.018	0
Sales of water heating units - Electric Heat Pump (%)	4.05	3.58	15.8	40	45.3	45.8	45.9
Sales of water heating units - Electric Resistance (%)	19.4	12.5	23.7	47.2	52.2	52.5	52.5
Sales of water heating units - Gas Furnace (%)	58.2	78.7	58.4	11.2	0.896	0.03	0
Sales of water heating units - Other (%)	18.4	5.18	2.06	1.6	1.59	1.59	1.61

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

Item	2020	2025	2030	2035	2040	2045	2050
Electricity distribution capital invested -		0.631	0.64	1.22	1.29	1.26	1.32
Cumulative 5-yr (billion \$2018)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Final energy use - Commercial (PJ)	35.3	33	31.4	29.1	26.7	25.2	24.5

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

Item	2020	2025	2030	2035	2040	2045	2050
Final energy use - Industry (PJ)	90.9	89.1	85.7	82.2	79.8	103	102
Final energy use - Residential (PJ)	77.2	68.5	59.5	49.6	40.9	34.8	31.1
Final energy use - Transportation (PJ)	115	106	92.8	76.3	61.2	51.9	48

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

Item	2020	2025	2030	2035	2040	2045	2050
Residential HVAC investment in 2020s vs.	0	1.25	1.28	0	0	0	0
REF - Cumulative 5-yr (billion \$2018)							
Sales of cooking units - Electric	64.2	71.8	95.2	99.8	100	100	100
Resistance (%)							
Sales of cooking units - Gas (%)	35.8	28.2	4.82	0.243	0	0	0
Sales of space heating units - Electric	3	12.5	61.9	80.8	83.2	83.5	83.4
Heat Pump (%)							
Sales of space heating units - Electric	1.39	1.41	1.15	0.541	0.387	0.388	0.424
Resistance (%)							
Sales of space heating units - Fossil (%)	88.9	82.5	34.4	18.2	16.4	16.1	16.2
Sales of space heating units - Gas (%)	6.74	3.55	2.57	0.511	0.068	0.03	0.029
Sales of water heating units - Electric	0	2.79	18.7	33.9	36.7	36.9	37
Heat Pump (%)							
Sales of water heating units - Electric	25.5	44.1	55.6	61.8	62.9	63	62.9
Resistance (%)							
Sales of water heating units - Gas Furnace	31.8	28.3	20.9	4	0.319	0.011	0
(%)							
Sales of water heating units - Other (%)	42.8	24.8	4.76	0.282	0.088	0.088	0.088

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

Item	2020	2025	2030	2035	2040	2045	2050
Light-duty vehicle capital costs -	0	216	554	896	1,358	1,478	1,409
Cumulative 5-yr (million \$2018)							
Public EV charging plugs - DC Fast (1000	0.118	0	0.513	0	2.24	0	3.63
units)							
Public EV charging plugs - L2 (1000 units)	0.3	0	12.3	0	53.9	0	87.1
Vehicle sales - Heavy-duty - diesel (%)	97.2	92.1	67	23.3	4.22	0.628	0
Vehicle sales - Heavy-duty - EV (%)	0.588	3.81	19	45.6	57.4	59.6	60
Vehicle sales - Heavy-duty - gasoline (%)	0.227	0.227	0.176	0.066	0.013	0.002	0
Vehicle sales - Heavy-duty - hybrid (%)	0.082	0.09	0.077	0.031	0.007	0.001	0
Vehicle sales - Heavy-duty - hydrogen FC	0.392	2.54	12.7	30.4	38.2	39.7	40
(%)							
Vehicle sales - Heavy-duty - other (%)	1.5	1.23	1.07	0.568	0.163	0.038	0
Vehicle sales - Light-duty - diesel (%)	1.67	1.92	1.3	0.419	0.076	0.013	0
Vehicle sales - Light-duty - EV (%)	3.52	14	44.6	81.1	96.2	99.3	100
Vehicle sales - Light-duty - gasoline (%)	90.6	79.4	50.7	17.3	3.39	0.593	0
Vehicle sales - Light-duty - hybrid (%)	4.04	4.26	3.08	1.16	0.279	0.06	0
Vehicle sales - Light-duty - hydrogen FC	0.111	0.346	0.212	0.066	0.013	0.002	0
(%)							
Vehicle sales - Light-duty - other (%)	0.107	0.103	0.069	0.024	0.005	0.001	0
Vehicle sales - Medium-duty - diesel (%)	64.7	59.7	42.3	14.4	2.59	0.384	0
Vehicle sales - Medium-duty - EV (%)	0.784	5.07	25.3	60.8	76.5	79.5	80
Vehicle sales - Medium-duty - gasoline (%)	33.7	33.3	25.5	9.32	1.77	0.277	0
Vehicle sales - Medium-duty - hybrid (%)	0.363	0.402	0.341	0.14	0.03	0.005	0
Vehicle sales - Medium-duty - hydrogen	0.196	1.27	6.33	15.2	19.1	19.9	20
FC (%)							
Vehicle sales - Medium-duty - other (%)	0.253	0.255	0.205	0.083	0.019	0.004	0

Table 40: E+RE- scenario - PILLAR 2: Clean Electricity - Generating capacity

Item	2020	2025	2030	2035	2040	2045	2050
Capital invested - Solar PV - Base (billion \$2018)		0	0	0	0	0	0
Capital invested - Solar PV - Constrained (billion \$2018)		0	0	0	0	0	0
Capital invested - Wind - Base (billion \$2018)		0	0	0	0	0	0
Capital invested - Wind - Constrained (billion \$2018)		0	0	0	0	0	0

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

Item	2020	2025	2030	2035	2040	2045	2050
Solar - Base land use assumptions (GWh)	176						
Solar - Constrained land use assumptions (GWh)	176						
Wind - Base land use assumptions (GWh)	4,130						
Wind - Constrained land use assumptions (GWh)	4,130						

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Aggressive							0
deployment - Corn-ethanol to energy							
grasses (1000 tCO2e/y)							
Carbon sink potential - Aggressive							-312
deployment - Cropland measures (1000							
tCO2e/y)							
Carbon sink potential - Aggressive							-10.1
deployment - Permanent conservation							
cover (1000 tCO2e/y)							
Carbon sink potential - Aggressive							-322
deployment - Total (1000 tCO2e/y)							
Carbon sink potential - Moderate							0
deployment - Corn-ethanol to energy							
grasses (1000 tCO2e/y)							
Carbon sink potential - Moderate							-164
deployment - Cropland measures (1000							
tCO2e/y)							
Carbon sink potential - Moderate							-5.04
deployment - Permanent conservation							
cover (1000 tC02e/y)							
Carbon sink potential - Moderate							-169
deployment - Total (1000 tCO2e/y)							
Land impacted for carbon sink -							0
Aggressive deployment - Corn-ethanol to							
energy grasses (1000 hectares)							
Land impacted for carbon sink -							173
Aggressive deployment - Cropland							
measures (1000 hectares)							
Land impacted for carbon sink -							18.3
Aggressive deployment - Permanent							
conservation cover (1000 hectares)							
Land impacted for carbon sink -							191
Aggressive deployment - Total (1000							
hectares)							
Land impacted for carbon sink - Moderate							0
deployment - Corn-ethanol to energy							
grasses (1000 hectares)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Land impacted for carbon sink - Moderate deployment - Cropland measures (1000 hectares)							91.1
Land impacted for carbon sink - Moderate deployment - Permanent conservation cover (1000 hectares)							9.16
Land impacted for carbon sink - Moderate deployment - Total (1000 hectares)							100

Table 43: E+RE- scenario - PILLAR 6: Land	l sinks - Fore	ests					
Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - High - Accelerate							-107
regeneration (1000 tCO2e/y)							
Carbon sink potential - High - All (not							-26,905
counting overlap) (1000 tCO2e/y)							
Carbon sink potential - High - Avoid							-538
deforestation (1000 tCO2e/y)							
Carbon sink potential - High - Extend							-10,590
rotation length (1000 tCO2e/y)							
Carbon sink potential - High - Improve							-309
plantations (1000 tCO2e/y)							
Carbon sink potential - High - Increase							-10,909
retention of HWP (1000 tCO2e/y)							•
Carbon sink potential - High - Increase							-133
trees outside forests (1000 tCO2e/y)							
Carbon sink potential - High - Reforest						+	-401
cropland (1000 tCO2e/y)							
Carbon sink potential - High - Reforest							-373
pasture (1000 tC02e/y)							010
Carbon sink potential - High - Restore							-3,545
productivity (1000 tCO2e/y)							-3,545
Carbon sink potential - Low - Accelerate							-53.7
regeneration (1000 tCO2e/y)							-55.1
Carbon sink potential - Low - All (not							-9,475
counting overlap) (1000 tC02e/y)							-9,415
Carbon sink potential - Low - Avoid							-89.7
							-07.1
deforestation (1000 tC02e/y)							/ 0/0
Carbon sink potential - Low - Extend							-4,068
rotation length (1000 tC02e/y)							-157
Carbon sink potential - Low - Improve							-157
plantations (1000 tCO2e/y)							0.707
Carbon sink potential - Low - Increase							-3,636
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - Low - Increase							-46.4
trees outside forests (1000 tC02e/y)							
Carbon sink potential - Low - Reforest							-201
cropland (1000 tCO2e/y)							
Carbon sink potential - Low - Reforest							-28.2
pasture (1000 tCO2e/y)							
Carbon sink potential - Low - Restore							-1,195
productivity (1000 tCO2e/y)							
Carbon sink potential - Mid - Accelerate							-80.5
regeneration (1000 tCO2e/y)							
Carbon sink potential - Mid - All (not							-18,187
counting overlap) (1000 tCO2e/y)							
Carbon sink potential - Mid - Avoid							-314
deforestation (1000 tCO2e/y)							
Carbon sink potential - Mid - Extend							-7,329
rotation length (1000 tCO2e/y)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Mid - Improve							-230
plantations (1000 tC02e/y)						+	7.070
Carbon sink potential - Mid - Increase							-7,273
retention of HWP (1000 tC02e/y) Carbon sink potential - Mid - Increase							-89.4
trees outside forests (1000 tC02e/y)							-07.4
Carbon sink potential - Mid - Reforest						+	-301
cropland (1000 tC02e/y)							-301
Carbon sink potential - Mid - Reforest							-200
pasture (1000 tC02e/y)							-200
Carbon sink potential - Mid - Restore							-2,370
productivity (1000 tC02e/y)							2,010
Land impacted for carbon sink potential -							17.5
High - Accelerate regeneration (1000							
hectares)							
Land impacted for carbon sink potential -							72.9
High - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							5,400
High - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							114
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 -							12.6
High - Increase trees outside forests							
(1000 hectares)							
Land impacted for carbon sink potential -							26.5
High - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							10.6
High - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							1,175
High - Restore productivity (1000							
hectares)							/ 000
Land impacted for carbon sink potential -							6,829
High - Total impacted (over 30 years)							
(1000 hectares) Land impacted for carbon sink potential -							8.77
Low - Accelerate regeneration (1000							0.11
hectares)							
Land impacted for carbon sink potential -						+	68.4
Low - Avoid deforestation (over 30 years)							00.4
(1000 hectares)							
Land impacted for carbon sink potential -						+	2,069
Low - Extend rotation length (1000							2,007
hectares)							
Land impacted for carbon sink potential -						+	56.9
Low - Improve plantations (1000							
hectares)							
Land impacted for carbon sink potential -							0
Low - Increase retention of HWP (1000							
hectares)							
Land impacted for carbon sink potential -							6.63
Low - Increase trees outside forests							
(1000 hectares)							
Land impacted for carbon sink potential -							13.3
Low - Reforest cropland (1000 hectares)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Land impacted for carbon sink potential -							1.84
Low - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							711
Low - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							2,936
Low - Total impacted (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							13.2
Mid - Accelerate regeneration (1000							
hectares)							
Land impacted for carbon sink potential -							70.6
Mid - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							3,734
Mid - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							85.7
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 -							9.61
Mid - Increase trees outside forests (1000							
hectares)							
Land impacted for carbon sink potential -							19.9
Mid - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							13.3
Mid - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							1,432
Mid - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							5,379
Mid - Total impacted (over 30 years) (1000							
hectares)							

Table 44: E+RE- scenario - IMPACTS - Health

Item	2020	2025	2030	2035	2040	2045	2050
Monetary damages from air pollution - Coal (million 2019\$)		124	0.147	0.146	0.14	0.083	0.004
Monetary damages from air pollution - Natural Gas (million 2019\$)		34.7	19.4	21	15.7	7.44	1.74
Monetary damages from air pollution - Transportation (million 2019\$)		163	149	111	62.7	27.6	10.1
Premature deaths from air pollution - Coal (deaths)		14	0.017	0.017	0.016	0.009	0
Premature deaths from air pollution - Natural Gas (deaths)		3.92	2.19	2.37	1.77	0.84	0.197
Premature deaths from air pollution - Transportation (deaths)		18.4	16.8	12.5	7.05	3.11	1.14

Table 45: E-B+ scenario - PILLAR 1: Efficiency/Electrification - Commercial

Item	2020	2025	2030	2035	2040	2045	2050	
Commercial HVAC investment in 2020s -	0	2,622	2,866	0	0	0	0	
Cumulative 5-yr (million \$2018)								
Sales of cooking units - Electric	36.9	40.7	44.7	56.5	72.7	82.9	86.4	
Resistance (%)								
Sales of cooking units - Gas (%)	63.1	59.3	55.3	43.5	27.3	17.1	13.6	

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Table 45' F-B+ scenario -	- PTLLAR 1 [,] Efficiency/Flectrification -	- Commercial Icontinued I

Item	2020	2025	2030	2035	2040	2045	2050
Sales of space heating units - Electric	2.33	6.89	8.48	13.3	22.8	32.7	38.1
Heat Pump (%)							
Sales of space heating units - Electric	1.31	1.76	2.43	4.48	7.93	10.5	11.3
Resistance (%)							
Sales of space heating units - Fossil (%)	84.1	39.2	38.1	33.9	26.8	22.3	21
Sales of space heating units - Gas Furnace	12.2	52.1	51	48.4	42.5	34.6	29.5
(%)							
Sales of water heating units - Electric	4.05	2.68	3.38	5.63	11.1	17.9	22
Heat Pump (%)							
Sales of water heating units - Electric	19.4	11.6	11.9	14.5	19.6	26	29.9
Resistance (%)							
Sales of water heating units - Gas Furnace	58.2	79.9	79.4	75.1	65.2	52.6	44.8
(%)							
Sales of water heating units - Other (%)	18.4	5.77	5.34	4.75	4.17	3.55	3.28

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

Item	2020	2025	2030	2035	2040	2045	2050
Electricity distribution capital invested -		0.484	0.475	0.654	0.668	1.11	1.17
Cumulative 5-yr (billion \$2018)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Final energy use - Commercial (PJ)	35.3	33	32	31	30	29	28.3
Final energy use - Industry (PJ)	90.9	89.2	86.1	83	81.1	104	103
Final energy use - Residential (PJ)	77.2	68.8	62.6	57.4	52.4	47.4	42.8
Final energy use - Transportation (PJ)	115	107	97.2	89.2	82.9	75.5	66.9

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

Item	2020	2025	2030	2035	2040	2045	2050
Residential HVAC investment in 2020s vs.	0	1.25	1.38	0	0	0	0
REF - Cumulative 5-yr (billion \$2018)							
Sales of cooking units - Electric	64.1	65	68.3	77	89	96.5	99
Resistance (%)							
Sales of cooking units - Gas (%)	35.9	35	31.7	23	11	3.54	0.953
Sales of space heating units - Electric	3	2.62	5.43	13.6	26.9	36.8	40.8
Heat Pump (%)							
Sales of space heating units - Electric	1.39	1.43	1.43	1.44	1.28	1.11	1.03
Resistance (%)							
Sales of space heating units - Fossil (%)	88.9	92.3	89.6	81.5	68.9	59.6	56.1
Sales of space heating units - Gas (%)	6.74	3.62	3.58	3.39	2.96	2.45	2.07
Sales of water heating units - Electric	0	0.324	1.24	4.01	9.3	14.5	17.2
Heat Pump (%)							
Sales of water heating units - Electric	25.5	41.9	42.4	44.6	47.8	50.5	51.8
Resistance (%)							
Sales of water heating units - Gas Furnace	31.8	28.7	28.4	26.9	23.4	18.8	16
(%)							
Sales of water heating units - Other (%)	42.8	29.1	28	24.5	19.5	16.2	15

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

Item	2020	2025	2030	2035	2040	2045	2050
Light-duty vehicle capital costs -	0	0	35	73.4	248	780	1,136
Cumulative 5-yr (million \$2018)							
Public EV charging plugs - DC Fast (1000 units)	0.118	0	0.159	0	0.833	0	2.32
Public EV charging plugs - L2 (1000 units)	0.3	0	3.82	0	20	0	55.8
Vehicle sales - Heavy-duty - diesel (%)	97.4	96	91.3	79.8	58.2	32.1	13.7

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

Item	2020	2025	2030	2035	2040	2045	2050
Vehicle sales - Heavy-duty - EV (%)	0.498	1.45	4.11	10.8	23.6	39.5	51
Vehicle sales - Heavy-duty - gasoline (%)	0.228	0.236	0.239	0.225	0.179	0.109	0.051
Vehicle sales - Heavy-duty - hybrid (%)	0.083	0.094	0.104	0.107	0.092	0.06	0.03
Vehicle sales - Heavy-duty - hydrogen FC	0.332	0.969	2.74	7.17	15.7	26.3	34
(%)							
Vehicle sales - Heavy-duty - other (%)	1.5	1.28	1.46	1.95	2.25	1.96	1.14
Vehicle sales - Light-duty - diesel (%)	1.68	2.07	2.08	1.66	1.07	0.552	0.236
Vehicle sales - Light-duty - EV (%)	1.75	4.38	11.2	24.8	47.3	71.3	87.3
Vehicle sales - Light-duty - gasoline (%)	92.2	88.1	80.6	67.9	47.5	25.6	11.3
Vehicle sales - Light-duty - hybrid (%)	4.18	5.01	5.66	5.21	3.96	2.37	1.16
Vehicle sales - Light-duty - hydrogen FC	0.113	0.384	0.333	0.257	0.184	0.103	0.048
(%)							
Vehicle sales - Light-duty - other (%)	0.108	0.111	0.102	0.089	0.065	0.036	0.016
Vehicle sales - Medium-duty - diesel (%)	64.8	62.2	57.7	49.4	35.6	19.6	8.37
Vehicle sales - Medium-duty - EV (%)	0.664	1.94	5.49	14.3	31.4	52.6	68
Vehicle sales - Medium-duty - gasoline (%)	33.8	34.7	34.7	31.9	24.4	14.2	6.33
Vehicle sales - Medium-duty - hybrid (%)	0.363	0.418	0.464	0.478	0.414	0.275	0.141
Vehicle sales - Medium-duty - hydrogen	0.166	0.485	1.37	3.58	7.86	13.2	17
FC (%)							
Vehicle sales - Medium-duty - other (%)	0.253	0.266	0.279	0.286	0.258	0.184	0.102

Table 50: E-B+ scenario - PILLAR 2: Clean Electricity - Generating capacity

Item	2020	2025	2030	2035	2040	2045	2050
Capital invested - Biomass power plant (billion \$2018)	0	0	0.917	0	0	0	0
Capital invested - Biomass w/ccu allam power plant (billion \$2018)	0	0	0	0	0	0	0.019
Capital invested - Biomass w/ccu power plant (billion \$2018)	0	0	0	0	0	0	0.022

Table 51: E-B+ scenario - PILLAR 2: Clean Electricity - Generation

Item	2020	2025	2030	2035	2040	2045	2050
Biomass power plant (GWh)	0	0	1,801	1,801	1,801	1,801	1,801
Biomass w/ccu allam power plant (GWh)	0	0	0	0	0	0	18.7
Biomass w/ccu power plant (GWh)	0	0	0	0	0	0	24.7

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

Item	2020	2025	2030	2035	2040	2045	2050
Biomass purchases (million \$2018/year)	0	0.052	136	136	136	136	457
Conversion capital investment -	0	0.047	1,023	0	0	0	3,664
Cumulative 5-yr (million \$2018)							
Number of facilities - Allam power w ccu	0	0	0	0	0	0	1
(quantity)							
Number of facilities - Beccs hydrogen	0	0	0	0	0	0	4
(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 - Power (quantity)	0	0	2	2	2	2	2
Number of facilities - Power ccu	0	0	0	0	0	0	1
(quantity)							
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	1	1	1	1	1	1
Number of facilities - Sng ccu (quantity)	0	0	0	0	0	0	1

Table 53: E-B+ scenario - PILLAR 4: CCUS - CO2 capture

Item	2020	2025	2030	2035	2040	2045	2050
Annual - All (MMT)		0	0	0	3.32	3.42	8.05
Annual - BECCS (MMT)		0	0	0	0	0	4.52
Annual - Cement and lime (MMT)		0	0	0	3.32	3.42	3.53
Annual - NGCC (MMT)		0	0	0	0	0	0
Cumulative - All (MMT)		0	0	0	3.32	6.74	14.8
Cumulative - BECCS (MMT)		0	0	0	0	0	4.52
Cumulative - Cement and lime (MMT)		0	0	0	3.32	6.74	10.3
Cumulative - NGCC (MMT)		0	0	0	0	0	0

Table 54: E-B+ scenario - PILLAR 4: CCUS - CO2 pipelines

Item	2020	2025	2030	2035	2040	2045	2050
All (km)		0	151	151	267	267	801
Cumulative investment - All (million \$2018)		0	273	273	388	390	760
Cumulative investment - Spur (million \$2018)		0	0	0	115	116	487
Cumulative investment - Trunk (million \$2018)		0	273	273	273	273	273
Spur (km)		0	0	0	116	116	650
Trunk (km)		0	151	151	151	151	151

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

· · · · · · · · · · · · · · · · · · ·										
Item	2020	2025	2030	2035	2040	2045	2050			
CO2 storage (MMT)		0	0	0	0	0	0			
Injection wells (wells)		0	0	0	0	0	0			
Resource characterization, appraisal, permitting costs (million \$2020)		0	0	0	0	0	0			
Wells and facilities construction costs (million \$2020)		0	0	0	0	0	0			

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

Carbon sink potential - Aggressive	$\overline{}$
	0
deployment - Corn-ethanol to energy	
grasses (1000 tC02e/y)	
Carbon sink potential - Aggressive	-312
deployment - Cropland measures (1000	
tCO2e/y)	
Carbon sink potential - Aggressive	0
deployment - Cropland to woody energy	
crops (1000 tC02e/y)	
Carbon sink potential - Aggressive	0
deployment - Pasture to energy crops	
(1000 tC02e/y)	
Carbon sink potential - Aggressive	-10.1
deployment - Permanent conservation	
cover (1000 tC02e/y)	
Carbon sink potential - Aggressive	-322
deployment - Total (1000 tC02e/y)	
Carbon sink potential - Moderate	0
deployment - Corn-ethanol to energy	
grasses (1000 tC02e/y)	
Carbon sink potential - Moderate	-164
deployment - Cropland measures (1000	
tCO2e/y)	
Carbon sink potential - Moderate	0
deployment - Cropland to woody energy	
crops (1000 tC02e/y)	

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Moderate							0
deployment - Pasture to energy crops							
(1000 tC02e/y)							
Carbon sink potential - Moderate							-5.04
deployment - Permanent conservation							
cover (1000 tCO2e/y)							
Carbon sink potential - Moderate							-169
deployment - Total (1000 tCO2e/y)							
Land impacted for carbon sink -							0
Aggressive deployment - Corn-ethanol to							
energy grasses (1000 hectares)							
Land impacted for carbon sink -							427
Aggressive deployment - Cropland							
measures (1000 hectares)							
Land impacted for carbon sink -							0
Aggressive deployment - Cropland to							
woody energy crops (1000 hectares)							
Land impacted for carbon sink -							0.741
Aggressive deployment - Pasture to							
energy crops (1000 hectares)							
Land impacted for carbon sink -							18.3
Aggressive deployment - Permanent							
conservation cover (1000 hectares)							
Land impacted for carbon sink -							446
Aggressive deployment - Total (1000							
hectares)							
Land impacted for carbon sink - Moderate							0
deployment - Corn-ethanol to energy							·
grasses (1000 hectares)							
Land impacted for carbon sink - Moderate							91.1
deployment - Cropland measures (1000							7
hectares)							
Land impacted for carbon sink - Moderate							0
deployment - Cropland to woody energy							J
crops (1000 hectares)							
Land impacted for carbon sink - Moderate							0.742
deployment - Pasture to energy crops							0.142
(1000 hectares)							
Land impacted for carbon sink - Moderate							9.16
deployment - Permanent conservation							7.10
cover (1000 hectares)							
Land impacted for carbon sink - Moderate							101
deployment - Total (1000 hectares)							101
aepioyment - rotal (1000 nectares)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - High - Accelerate							-107
regeneration (1000 tCO2e/y)							
Carbon sink potential - High - All (not							-26,905
counting overlap) (1000 tCO2e/y)							
Carbon sink potential - High - Avoid							-538
deforestation (1000 tCO2e/y)							
Carbon sink potential - High - Extend							-10,590
rotation length (1000 tCO2e/y)							
Carbon sink potential - High - Improve							-309
plantations (1000 tCO2e/y)							
Carbon sink potential - High - Increase							-10,909
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - High - Increase							-133
trees outside forests (1000 tCO2e/y)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - High - Reforest							-401
cropland (1000 tCO2e/y)							
Carbon sink potential - High - Reforest							-373
pasture (1000 tCO2e/y)							
Carbon sink potential - High - Restore							-3,545
productivity (1000 tCO2e/y)							
Carbon sink potential - Low - Accelerate							-53.7
regeneration (1000 tCO2e/y)							
Carbon sink potential - Low - All (not							-9,475
counting overlap) (1000 tCO2e/y)							
Carbon sink potential - Low - Avoid							-89.7
deforestation (1000 tCO2e/y)							
Carbon sink potential - Low - Extend							-4,068
rotation length (1000 tCO2e/y)							•
Carbon sink potential - Low - Improve							-157
plantations (1000 tCO2e/y)							
Carbon sink potential - Low - Increase							-3,636
retention of HWP (1000 tCO2e/y)							0,000
Carbon sink potential - Low - Increase							-46.4
trees outside forests (1000 tCO2e/y)							-40.4
Carbon sink potential - Low - Reforest							-201
·							-201
cropland (1000 tC02e/y)							00.0
Carbon sink potential - Low - Reforest							-28.2
pasture (1000 tC02e/y)							4405
Carbon sink potential - Low - Restore							-1,195
productivity (1000 tCO2e/y)							
Carbon sink potential - Mid - Accelerate							-80.5
regeneration (1000 tCO2e/y)							
Carbon sink potential - Mid - All (not							-18,187
counting overlap) (1000 tCO2e/y)							
Carbon sink potential - Mid - Avoid							-314
deforestation (1000 tCO2e/y)							
Carbon sink potential - Mid - Extend							-7,329
rotation length (1000 tCO2e/y)							
Carbon sink potential - Mid - Improve							-230
plantations (1000 tCO2e/y)							
Carbon sink potential - Mid - Increase							-7,273
retention of HWP (1000 tC02e/y)							•
Carbon sink potential - Mid - Increase							-89.4
trees outside forests (1000 tCO2e/y)							• • • • • • • • • • • • • • • • • • • •
Carbon sink potential - Mid - Reforest							-301
cropland (1000 tCO2e/y)							001
Carbon sink potential - Mid - Reforest							-200
pasture (1000 tC02e/y)							-200
Carbon sink potential - Mid - Restore							-2,370
							-2,310
productivity (1000 tC02e/y)							17.5
Land impacted for carbon sink potential -							17.5
High - Accelerate regeneration (1000							
hectares)							
Land impacted for carbon sink potential -							72.9
High - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							5,400
High - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							114
High - Improve plantations (1000							
hectares)							
Land impacted for carbon sink potential -							0
High - Increase retention of HWP (1000							
hectares)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Land impacted for carbon sink potential -							12.6
High - Increase trees outside forests (1000 hectares)							
Land impacted for carbon sink potential -							26.5
High - Reforest cropland (1000 hectares)							26.5
Land impacted for carbon sink potential -							10.6
High - Reforest pasture (1000 hectares)							10.0
Land impacted for carbon sink potential -							1,175
High - Restore productivity (1000							1,113
hectares)							
Land impacted for carbon sink potential -							6,829
High - Total impacted (over 30 years)							0,029
(1000 hectares)							
Land impacted for carbon sink potential -							8.77
							0.11
Low - Accelerate regeneration (1000							
hectares) Land impacted for carbon sink potential -							/0/
·							68.4
Low - Avoid deforestation (over 30 years)							
(1000 hectares)							0.070
Land impacted for carbon sink potential -							2,069
Low - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							56.9
Low - Improve plantations (1000							
hectares)							
Land impacted for carbon sink potential -							0
Low - Increase retention of HWP (1000							
hectares)							
Land impacted for carbon sink potential -							6.63
Low - Increase trees outside forests							
(1000 hectares)							
Land impacted for carbon sink potential -							13.3
Low - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							1.84
Low - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							711
Low - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							2,936
Low - Total impacted (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							13.2
Mid - Accelerate regeneration (1000							
hectares)							
Land impacted for carbon sink potential -							70.6
Mid - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							3,734
Mid - Extend rotation length (1000							0,101
hectares)							
Land impacted for carbon sink potential -			+				85.7
Mid - Improve plantations (1000 hectares)							00.1
Land impacted for carbon sink potential -			+				0
Mid - Increase retention of HWP (1000							U
hectares)							0.71
Land impacted for carbon sink potential -							9.61
Mid - Increase trees outside forests (1000							
hectares)							100
Land impacted for carbon sink potential -							19.9
Mid - Reforest cropland (1000 hectares)						[

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

Item	2020	2025	2030	2035	2040	2045	2050
Land impacted for carbon sink potential - Mid - Reforest pasture (1000 hectares)							13.3
Land impacted for carbon sink potential - Mid - Restore productivity (1000 hectares)							1,432
Land impacted for carbon sink potential - Mid - Total impacted (over 30 years) (1000 hectares)							5,379

Table 58: E-B+ scenario - IMPACTS - Health

Item	2020	2025	2030	2035	2040	2045	2050
Monetary damages from air pollution -		124	0.147	0.146	0.14	0.083	0.004
Coal (million 2019\$)							
Monetary damages from air pollution -		34.2	15.1	7.22	5.43	3.18	1.26
Natural Gas (million 2019\$)							
Monetary damages from air pollution -		166	164	156	138	107	71.8
Transportation (million 2019\$)							
Premature deaths from air pollution -		14	0.017	0.017	0.016	0.009	0
Coal (deaths)							
Premature deaths from air pollution -		3.86	1.7	0.816	0.613	0.359	0.142
Natural Gas (deaths)							
Premature deaths from air pollution -		18.7	18.5	17.6	15.5	12.1	8.08
Transportation (deaths)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Commercial HVAC investment in 2020s - Cumulative 5-yr (million \$2018)	0	2,590	2,664	0	0	0	0
Sales of cooking units - Electric Resistance (%)	36.9	39	38.6	38.5	38.3	38.5	38.4
Sales of cooking units - Gas (%)	63.1	61	61.4	61.5	61.7	61.5	61.6
Sales of space heating units - Electric Heat Pump (%)	2.33	12.7	40.4	63.6	67.5	67.8	68
Sales of space heating units - Electric Resistance (%)	1.31	2.46	7.45	19.9	30.2	32	32
Sales of space heating units - Fossil (%)	84.1	37.3	26.1	10.2	1.47	0.119	0
Sales of space heating units - Gas Furnace (%)	12.2	47.5	26.1	6.26	0.817	0.051	0
Sales of water heating units - Electric Heat Pump (%)	4.05	2.42	2.41	2.36	2.35	2.4	2.4
Sales of water heating units - Electric Resistance (%)	19.4	11.4	11	11.4	11.3	11.2	11.2
Sales of water heating units - Gas Furnace (%)	58.2	80.4	81.1	80.9	80.9	81.3	81.5
Sales of water heating units - Other (%)	18.4	5.83	5.56	5.37	5.48	5.14	4.87

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

Item	2020	2025	2030	2035	2040	2045	2050
Electricity distribution capital invested -		0.574	0.576	0.751	0.773	0.756	0.774
Cumulative 5-yr (billion \$2018)							

Table 61: REF scenario - PILLAR 1: Efficiency/Electrification - Overview

Item	2020	2025	2030	2035	2040	2045	2050
Final energy use - Commercial (PJ)	35.3	33.5	33	32	31	30.8	31.4
Final energy use - Industry (PJ)	90.9	92.9	93.4	94.3	96.6	99.5	102
Final energy use - Residential (PJ)	77.2	69.1	63.2	58.6	55.2	52.5	50.1
Final energy use - Transportation (PJ)	115	107	98	92.4	92.1	94.8	98.3

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

Item	2020	2025	2030	2035	2040	2045	2050
Residential HVAC investment in 2020s vs. REF - Cumulative 5-yr (billion \$2018)	0	1.23	1.26	0	0	0	0
Sales of cooking units - Electric Resistance (%)	63.8	63.8	63.8	63.8	63.8	63.8	63.8
Sales of cooking units - Gas (%)	36.2	36.2	36.2	36.2	36.2	36.2	36.2
Sales of space heating units - Electric Heat Pump (%)	2.88	4.65	4.91	5.31	5.38	5.44	5.51
Sales of space heating units - Electric Resistance (%)	1.4	1.38	1.39	1.43	1.39	1.36	1.32
Sales of space heating units - Fossil (%)	89	81.3	49.9	28.1	26.5	26.2	26.4
Sales of space heating units - Gas (%)	6.75	12.7	43.8	65.1	66.7	67	66.8
Sales of water heating units - Electric Heat Pump (%)	0	0	0	0	0	0	0
Sales of water heating units - Electric Resistance (%)	25.5	41.6	41.5	41.7	41.6	41.6	41.5
Sales of water heating units - Gas Furnace (%)	31.8	28.9	29	29	29.1	29.2	29.2
Sales of water heating units - Other (%)	42.8	29.5	29.5	29.3	29.3	29.2	29.2

Table 63: REF scenario - PILLAR 1: Efficiency/Electrification - Transportation

Item	2020	2025	2030	2035	2040	2045	2050
Vehicle sales - Heavy-duty - diesel (%)	98.1	98.2	97.9	97	95.6	93.5	91.6
Vehicle sales - Heavy-duty - EV (%)	0	0	0	0	0	0	0
Vehicle sales - Heavy-duty - gasoline (%)	0.229	0.242	0.257	0.274	0.294	0.317	0.343
Vehicle sales - Heavy-duty - hybrid (%)	0.083	0.096	0.112	0.13	0.15	0.174	0.202
Vehicle sales - Heavy-duty - hydrogen FC	0.119	0.138	0.16	0.186	0.216	0.25	0.29
(%)							
Vehicle sales - Heavy-duty - other (%)	1.51	1.31	1.57	2.37	3.69	5.71	7.57
Vehicle sales - Light-duty - diesel (%)	1.67	2.07	2.2	2.05	1.85	1.73	1.64
Vehicle sales - Light-duty - EV (%)	3.17	5.09	5.83	7.14	8.73	10.2	11.3
Vehicle sales - Light-duty - gasoline (%)	90.9	87.4	85.5	83.8	81.8	79.8	78.2
Vehicle sales - Light-duty - hybrid (%)	4.05	4.92	6.04	6.61	7.21	7.84	8.37
Vehicle sales - Light-duty - hydrogen FC	0.111	0.381	0.353	0.315	0.313	0.315	0.326
(%)							
Vehicle sales - Light-duty - other (%)	0.107	0.111	0.108	0.109	0.108	0.107	0.11
Vehicle sales - Medium-duty - diesel (%)	65.2	63.5	61.6	59.6	58	56.5	55.2
Vehicle sales - Medium-duty - EV (%)	0.027	0.105	0.329	0.671	0.895	0.973	0.993
Vehicle sales - Medium-duty - gasoline (%)	34	35.5	37	38.5	39.7	40.8	41.7
Vehicle sales - Medium-duty - hybrid (%)	0.365	0.427	0.496	0.577	0.674	0.793	0.929
Vehicle sales - Medium-duty - hydrogen	0.175	0.208	0.242	0.285	0.339	0.409	0.487
FC (%)							
Vehicle sales - Medium-duty - other (%)	0.255	0.271	0.298	0.345	0.42	0.528	0.671

Table 64: REF scenario - PILLAR 6: Land sinks - Forests

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - High - Accelerate							-107
regeneration (1000 tCO2e/y)							
Carbon sink potential - High - All (not							-26,905
counting overlap) (1000 tCO2e/y)							
Carbon sink potential - High - Avoid							-538
deforestation (1000 tCO2e/y)							
Carbon sink potential - High - Extend							-10,590
rotation length (1000 tCO2e/y)							
Carbon sink potential - High - Improve							-309
plantations (1000 tCO2e/y)							
Carbon sink potential - High - Increase							-10,909
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - High - Increase							-133
trees outside forests (1000 tCO2e/y)							

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

Item Carbon sink potential - High - Reforest	2020	2025	2030	2035	2040	2045	2050 -401
cropland (1000 tCO2e/y)							701
Carbon sink potential - High - Reforest pasture (1000 tCO2e/y)							-373
Carbon sink potential - High - Restore productivity (1000 tC02e/y)							-3,545
Carbon sink potential - Low - Accelerate regeneration (1000 tC02e/y)							-53.7
Carbon sink potential - Low - All (not counting overlap) (1000 tCO2e/y)							-9,475
Carbon sink potential - Low - Avoid deforestation (1000 tCO2e/y)							-89.7
Carbon sink potential - Low - Extend rotation length (1000 tCO2e/y)							-4,068
Carbon sink potential - Low - Improve plantations (1000 tCO2e/y)							-157
Carbon sink potential - Low - Increase retention of HWP (1000 tCO2e/y)							-3,636
Carbon sink potential - Low - Increase trees outside forests (1000 tC02e/y)							-46.4
Carbon sink potential - Low - Reforest cropland (1000 tCO2e/y)							-201
Carbon sink potential - Low - Reforest pasture (1000 tCO2e/y)							-28.2
Carbon sink potential - Low - Restore productivity (1000 tC02e/y)							-1,195
Carbon sink potential - Mid - Accelerate regeneration (1000 tC02e/y)							-80.5
Carbon sink potential - Mid - All (not counting overlap) (1000 tCO2e/y)							-18,187
Carbon sink potential - Mid - Avoid deforestation (1000 tC02e/y)							-314
Carbon sink potential - Mid - Extend rotation length (1000 tCO2e/y)							-7,329
Carbon sink potential - Mid - Improve plantations (1000 tCO2e/y)							-230
Carbon sink potential - Mid - Increase retention of HWP (1000 tC02e/y)							-7,273
Carbon sink potential - Mid - Increase trees outside forests (1000 tC02e/y)							-89.4
Carbon sink potential - Mid - Reforest cropland (1000 tCO2e/y)							-301
Carbon sink potential - Mid - Reforest pasture (1000 tCO2e/y)							-200
Carbon sink potential - Mid - Restore productivity (1000 tC02e/y)							-2,370
Land impacted for carbon sink potential - High - Accelerate regeneration (1000 hectares)							17.5
Land impacted for carbon sink potential - High - Avoid deforestation (over 30 years) (1000 hectares)							72.9
Land impacted for carbon sink potential - High - Extend rotation length (1000							5,400
hectares) Land impacted for carbon sink potential - High - Improve plantations (1000							114
hectares) Land impacted for carbon sink potential - High - Increase retention of HWP (1000 hectares)							0

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

Item Table 64: REF scenario - PILLAR 6: Land si	2020	2025	2030	2035	2040	2045	2050
Land impacted for carbon sink potential -							12.6
High - Increase trees outside forests							
(1000 hectares)							
Land impacted for carbon sink potential -							26.5
High - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							10.6
High - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							1,175
High - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							6,829
High - Total impacted (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							8.77
Low - Accelerate regeneration (1000							
hectares)							
Land impacted for carbon sink potential -							68.4
Low - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							2,069
Low - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							56.9
Low - Improve plantations (1000							
hectares)							
Land impacted for carbon sink potential -							0
Low - Increase retention of HWP (1000							
hectares)							
Land impacted for carbon sink potential -							6.63
Low - Increase trees outside forests							
(1000 hectares)							10.0
Land impacted for carbon sink potential -							13.3
Low - Reforest cropland (1000 hectares)							101
Land impacted for carbon sink potential -							1.84
Low - Reforest pasture (1000 hectares)							711
Land impacted for carbon sink potential -							711
Low - Restore productivity (1000							
hectares)							0.007
Land impacted for carbon sink potential -							2,936
Low - Total impacted (over 30 years)							
(1000 hectares)							13.2
Land impacted for carbon sink potential -							13.2
Mid - Accelerate regeneration (1000							
hectares) Land impacted for carbon sink potential -							70.6
Mid - Avoid deforestation (over 30 years)							70.6
(1000 hectares)							
Land impacted for carbon sink potential -							3,734
Mid - Extend rotation length (1000							3,134
hectares)							
Land impacted for carbon sink potential -							85.7
Mid - Improve plantations (1000 hectares)							00.1
Land impacted for carbon sink potential -	+				-		0
Mid - Increase retention of HWP (1000							U
hectares)							
-							9.61
Land impacted for carbon sink potential -							9.61
Mid - Increase trees outside forests (1000 hectares)							
Land impacted for carbon sink potential -							19.9
Mid - Reforest cropland (1000 hectares)							19.9
min - Keronest Gropialiu (1000 fiectares)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Land impacted for carbon sink potential -							13.3
Mid - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							1,432
Mid - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							5,379
Mid - Total impacted (over 30 years) (1000							
hectares)							

Table 65: REF scenario - PILLAR 6: Land sinks - Forests - REF only

Item	2020	2025	2030	2035	2040	2045	2050
Business-as-usual carbon sink - Natural uptake (Mt CO2e/y)	-6.38		-15.3				-13.7
Business-as-usual carbon sink - Retained in Hardwood Products (Mt CO2e/y)	-2.97		-5.34				-5.55
Business-as-usual carbon sink - Total (Mt CO2e/y)	-9.35		-20.6				-19.2

Table 66: REF scenario - IMPACTS - Health

Item	2020	2025	2030	2035	2040	2045	2050
Monetary damages from air pollution - Coal (million 2019\$)		350	220	203	199	195	169
Monetary damages from air pollution - Natural Gas (million 2019\$)		26.9	21.7	27	27.6	25.4	23.6
Monetary damages from air pollution - Transportation (million 2019\$)		166	166	167	167	168	168
Premature deaths from air pollution - Coal (deaths)		39.5	24.9	22.9	22.4	22	19.1
Premature deaths from air pollution - Natural Gas (deaths)		3.03	2.45	3.05	3.12	2.86	2.67
Premature deaths from air pollution - Transportation (deaths)		18.6	18.7	18.7	18.8	18.9	18.9