# Net-Zero America - maine state report

Larson et al. 2020

#### February 2021

These data underlie graphs and tables presented in the Princeton Net-Zero America study (E. Larson, C. Greig, J. Jenkins, E. Mayfield, A. Pascale, C. Zhang, J. Drossman, R. Williams, S. Pacala, R. Socolow, EJ Baik, R. Birdsey, R. Duke, R. Jones, B. Haley, E. Leslie, K. Paustian, and A. Swan, Net-Zero America: Potential Pathways, Infrastructure, and Impacts, interim report, Princeton University, Princeton, NJ, December 15, 2020. Report available at https://netzeroamerica.princeton.edu.)

#### **Notes**

- These data are a subset of all data from the study available at https://netzeroamerica.princeton.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 state-level 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.)
- Some results are not model outputs, but rather they are limits that apply across all scenarios (e.g., maximum carbon storage potential in agricultural soils).

#### **List of Tables**

1	E+ scenario - PILLAR 1: Efficiency/Electrification - Residential	4
2	E+ scenario - PILLAR 1: Efficiency/Electrification - Transportation	4
3	E+ scenario - PILLAR 1: Efficiency/Electrification - Overview	4
4	E+ scenario - PILLAR 1: Efficiency/Electrification - Commercial	4
5	E+ scenario - PILLAR 1: Efficiency/Electrification - Electricity demand	5
6	E+ scenario - PILLAR 2: Clean Electricity - Generating capacity	5
7	E+ scenario - PILLAR 2: Clean Electricity - Generation	5
8	E+ scenario - PILLAR 3: Clean fuels - Bioenergy	5
9	E+ scenario - PILLAR 4: CCUS - CO2 capture	6
10	E+ scenario - PILLAR 4: CCUS - CO2 storage	6
11	E+ scenario - PILLAR 4: CCUS - CO2 pipelines	6
12	E+ scenario - PILLAR 6: Land sinks - Agriculture	6
13	E+ scenario - PILLAR 6: Land sinks - Forests	7
14	E+ scenario - IMPACTS - Health	9
15	E+ scenario - IMPACTS - Jobs	9
16	E+ scenario - IMPACTS - Fossil fuel industries	10
17	F- scenario - PILLAR 1: Efficiency/Electrification - Residential	10

18	E- scenario - PILLAR 1: Efficiency/Electrification - Transportation	10
19	E- scenario - PILLAR 1: Efficiency/Electrification - Overview	11
20	E- scenario - PILLAR 1: Efficiency/Electrification - Commercial	11
21	E- scenario - PILLAR 1: Efficiency/Electrification - Electricity demand	11
22	E- scenario - PILLAR 6: Land sinks - Agriculture	11
23	E- scenario - PILLAR 6: Land sinks - Forests	12
24	E- scenario - IMPACTS - Health	14
25	E+RE+ scenario - PILLAR 1: Efficiency/Electrification - Residential	14
26	E+RE+ scenario - PILLAR 1: Efficiency/Electrification - Transportation	15
27	E+RE+ scenario - PILLAR 1: Efficiency/Electrification - Overview	15
28	E+RE+ scenario - PILLAR 1: Efficiency/Electrification - Commercial	15
29	E+RE+ scenario - PILLAR 1: Efficiency/Electrification - Electricity demand	16
30	E+RE+ scenario - PILLAR 2: Clean Electricity - Generating capacity	16
31	E+RE+ scenario - PILLAR 2: Clean Electricity - Generation	16
32	E+RE+ scenario - PILLAR 6: Land sinks - Agriculture	16
33	E+RE+ scenario - PILLAR 6: Land sinks - Forests	17
34	E+RE+ scenario - IMPACTS - Health	19
35	E+RE- scenario - PILLAR 1: Efficiency/Electrification - Residential	19
36	E+RE- scenario - PILLAR 1: Efficiency/Electrification - Transportation	19
37	E+RE- scenario - PILLAR 1: Efficiency/Electrification - Overview	20
38	E+RE- scenario - PILLAR 1: Efficiency/Electrification - Commercial	20
39	E+RE- scenario - PILLAR 1: Efficiency/Electrification - Electricity demand	20
40	E+RE- scenario - PILLAR 2: Clean Electricity - Generating capacity	20
41	E+RE- scenario - PILLAR 2: Clean Electricity - Generation	20
42	E+RE- scenario - PILLAR 6: Land sinks - Agriculture	20
43	E+RE- scenario - PILLAR 6: Land sinks - Forests	21
44	E+RE- scenario - IMPACTS - Health	23
45	E-B+ scenario - PILLAR 1: Efficiency/Electrification - Residential	23
46	E-B+ scenario - PILLAR 1: Efficiency/Electrification - Transportation	24
47	E-B+ scenario - PILLAR 1: Efficiency/Electrification - Overview	24
48	E-B+ scenario - PILLAR 1: Efficiency/Electrification - Commercial	24
49	E-B+ scenario - PILLAR 1: Efficiency/Electrification - Electricity demand	24
50	E-B+ scenario - PILLAR 2: Clean Electricity - Generating capacity	25
51	E-B+ scenario - PILLAR 2: Clean Electricity - Generation	25
52	E-B+ scenario - PILLAR 3: Clean fuels - Bioenergy	25
53	E-B+ scenario - PILLAR 4: CCUS - CO2 capture	25
54	E-B+ scenario - PILLAR 4: CCUS - CO2 storage	25
55	E-B+ scenario - PILLAR 4: CCUS - CO2 pipelines	25
56	E-B+ scenario - PILLAR 6: Land sinks - Agriculture	26
57	E-B+ scenario - PILLAR 6: Land sinks - Forests	27
58	REF scenario - PILLAR 1: Efficiency/Electrification - Residential	29

59	REF scenario - PILLAR 1: Efficiency/Electrification - Transportation	29
60	REF scenario - PILLAR 1: Efficiency/Electrification - Overview	29
61	REF scenario - PILLAR 1: Efficiency/Electrification - Commercial	29
62	REF scenario - PILLAR 1: Efficiency/Electrification - Electricity demand	30
63	REF scenario - PILLAR 6: Land sinks - Forests	30
64	REF scenario - IMPACTS - Health	32

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

Item	2020	2025	2030	2035	2040	2045	2050
Residential HVAC investment in 2020s vs. REF -	0	1.25	1.28	0	0	0	0
Cumulative 5-yr (billion \$2018)							
Sales of cooking units - Electric Resistance (%)	64.2	71.8	95.2	99.8	100	100	100
Sales of cooking units - Gas (%)	35.8	28.2	4.82	0.243	0	0	0
Sales of space heating units - Electric Heat Pump	3	12.5	61.9	80.8	83.2	83.5	83.4
(%)							
Sales of space heating units - Electric Resistance	1.39	1.41	1.15	0.541	0.387	0.388	0.424
(%)							
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 Heat Pump	0	2.79	18.7	33.9	36.7	36.9	37
(%)							
Sales of water heating units - Electric Resistance	25.5	44.1	55.6	61.8	62.9	63	62.9
(%)							
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 2: E+ scenario - PILLAR 1: Efficiency/Electrification - Transportation

Item	2020	2025	2030	2035	2040	2045	2050
Light-duty vehicle capital costs - Cumulative 5-yr	0	216	554	896	1,358	1,478	1,409
(million \$2018)							
Public EV charging plugs - DC Fast (1000 units)	0.118	0	0.513	0	2.24	0	3.63
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 FC (%)	0.196	1.27	6.33	15.2	19.1	19.9	20
Vehicle sales - Medium-duty - other (%)	0.253	0.255	0.205	0.083	0.019	0.004	0

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 - Commercial

Item	2020	2025	2030	2035	2040	2045	2050
Commercial HVAC investment in 2020s -	0	2,622	2,862	0	0	0	0
Cumulative 5-yr (million \$2018)							
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

Table 4: E+ scenario -	PTI I AR 1. Efficiency	//Flectrification -	Commercial	(continued)
Table 4. LT Scellul lo	TILLAN I. LIIIGIGIIGN	// LICCUI IIICUUIUII -	COMMENTS CIUI	lcontinucui

Item	2020	2025	2030	2035	2040	2045	2050
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 5: E+ scenario - PILLAR 1: Efficiency/Electrification - Electricity demand

Item	2020	2025	2030	2035	2040	2045	2050
Electricity distribution capital invested -	0	0.631	0.64	1.22	1.29	1.26	1.32
Cumulative 5-yr (billion \$2018)							

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

Item	2020	2025	2030	2035	2040	2045	2050
				2000	2040		2030
Capital invested - Biomass power plant (billion	0	0	0.184	0	0	0	Ü
\$2018)							
Capital invested - Biomass w/ccu allam power	0	0	0	0	0	0	0
plant (billion \$2018)							
Capital invested - Biomass w/ccu power plant	0	0	0	0	0	0	0
(billion \$2018)							
Capital invested - Offshore Wind - Base (billion	0	0	0	0	0	5.07	33.7
\$2018)							
Capital invested - Solar PV - Base (billion \$2018)	0	0	0	0	0	0	4.17
Capital invested - Solar PV - Constrained (billion	0	0.114	0	0	0	0.302	5.36
\$2018)							
Capital invested - Wind - Base (billion \$2018)	0	0	0	0	0	0	0.077
Capital invested - Wind - Constrained (billion	0	0	0	0	0	0	0
\$2018)							

#### 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
OffshoreWind - Base land use assumptions (GWh)	0	0	0	0	0	15,250	127,672
OffshoreWind - Constrained land use assumptions (GWh)	0	0	0	0	0	15,250	127,672
Solar - Base land use assumptions (GWh)	176	0	0	0	0	0	8,048
Solar - Constrained land use assumptions (GWh)	176	0	0	953	588	0	5,812
Wind - Base land use assumptions (GWh)	4,130	0	0	0	0	0	175
Wind - Constrained land use assumptions (GWh)	4,130	0	0	0	0	0	0

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

Item	2020	2025	2030	2035	2040	2045	2050
Biomass purchases (million \$2018/year)	0	0.025	14.3	14.3	14.3	14.3	126
Conversion capital investment - Cumulative 5-yr	0	0.039	205	0	0	0	2,372
(million \$2018)							
Number of facilities - Allam power w ccu	0	0	0	0	0	0	0
(quantity)							
Number of facilities - Beccs hydrogen (quantity)	0	0	0	0	0	0	2
Number of facilities - Diesel (quantity)	0	0	0	0	0	0	0
Number of facilities - Diesel ccu (quantity)	0	0	0	0	0	0	0
Number of facilities - Power (quantity)	0	0	1	1	1	1	1
Number of facilities - Power ccu (quantity)	0	0	0	0	0	0	0
Number of facilities - Pyrolysis (quantity)	0	0	0	0	0	0	0
Number of facilities - Pyrolysis ccu (quantity)	0	0	0	0	0	0	0
Number of facilities - Sng (quantity)	0	1	1	1	1	1	1
Number of facilities - Sng ccu (quantity)	0	0	0	0	0	0	0

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

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

#### Table 10: E+ scenario - PILLAR 4: CCUS - CO2 storage

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

# Table 11: E+ scenario - PILLAR 4: CCUS - CO2 pipelines

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

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

Carbon sink potential - Aggressive deployment - Corn-ethanol to energy grasses (1000 tCO2e/y)  Carbon sink potential - Aggressive deployment - Cropland measures (1000 tCO2e/y)  Carbon sink potential - Aggressive deployment - Permanent conservation cover (1000 tCO2e/y)  Carbon sink potential - Aggressive deployment - Total (1000 tCO2e/y)  Carbon sink potential - Moderate deployment - Corn-ethanol to energy grasses (1000 tCO2e/y)  Carbon sink potential - Moderate deployment - Cropland measures (1000 tCO2e/y)  Carbon sink potential - Moderate deployment - Cropland measures (1000 tCO2e/y)  Carbon sink potential - Moderate deployment - Dermanent conservation cover (1000 tCO2e/y)  Carbon sink potential - Moderate deployment - Total (1000 tCO2e/y)  Land impacted for carbon sink - Aggressive deployment - Corn-ethanol to energy grasses
Carbon sink potential - Aggressive deployment - Cropland measures (1000 tC02e/y)  Carbon sink potential - Aggressive deployment - Permanent conservation cover (1000 tC02e/y)  Carbon sink potential - Aggressive deployment - Total (1000 tC02e/y)  Carbon sink potential - Moderate deployment - Corn-ethanol to energy grasses (1000 tC02e/y)  Carbon sink potential - Moderate deployment - Cropland measures (1000 tC02e/y)  Carbon sink potential - Moderate deployment - Cropland measures (1000 tC02e/y)  Carbon sink potential - Moderate deployment - Permanent conservation cover (1000 tC02e/y)  Carbon sink potential - Moderate deployment - Total (1000 tC02e/y)  Land impacted for carbon sink - Aggressive deployment - Corn-ethanol to energy grasses
Cropland measures (1000 tCO2e/y)  Carbon sink potential - Aggressive deployment - Permanent conservation cover (1000 tCO2e/y)  Carbon sink potential - Aggressive deployment - Total (1000 tCO2e/y)  Carbon sink potential - Moderate deployment - Corn-ethanol to energy grasses (1000 tCO2e/y)  Carbon sink potential - Moderate deployment - Cropland measures (1000 tCO2e/y)  Carbon sink potential - Moderate deployment - Cropland measures (1000 tCO2e/y)  Carbon sink potential - Moderate deployment - Permanent conservation cover (1000 tCO2e/y)  Carbon sink potential - Moderate deployment - Total (1000 tCO2e/y)  Land impacted for carbon sink - Aggressive deployment - Corn-ethanol to energy grasses
Carbon sink potential - Aggressive deployment - Permanent conservation cover (1000 tC02e/y)  Carbon sink potential - Aggressive deployment - Total (1000 tC02e/y)  Carbon sink potential - Moderate deployment - Corn-ethanol to energy grasses (1000 tC02e/y)  Carbon sink potential - Moderate deployment - Cropland measures (1000 tC02e/y)  Carbon sink potential - Moderate deployment - Permanent conservation cover (1000 tC02e/y)  Carbon sink potential - Moderate deployment - Total (1000 tC02e/y)  Land impacted for carbon sink - Aggressive deployment - Corn-ethanol to energy grasses
Permanent conservation cover (1000 tC02e/y)  Carbon sink potential - Aggressive deployment - Total (1000 tC02e/y)  Carbon sink potential - Moderate deployment - Corn-ethanol to energy grasses (1000 tC02e/y)  Carbon sink potential - Moderate deployment - Cropland measures (1000 tC02e/y)  Carbon sink potential - Moderate deployment - Permanent conservation cover (1000 tC02e/y)  Carbon sink potential - Moderate deployment - Potal (1000 tC02e/y)  Land impacted for carbon sink - Aggressive deployment - Corn-ethanol to energy grasses
Carbon sink potential - Aggressive deployment - Total (1000 tC02e/y)  Carbon sink potential - Moderate deployment - Corn-ethanol to energy grasses (1000 tC02e/y)  Carbon sink potential - Moderate deployment - Cropland measures (1000 tC02e/y)  Carbon sink potential - Moderate deployment - Permanent conservation cover (1000 tC02e/y)  Carbon sink potential - Moderate deployment - Potal (1000 tC02e/y)  Land impacted for carbon sink - Aggressive deployment - Corn-ethanol to energy grasses
Total (1000 tC02e/y)  Carbon sink potential - Moderate deployment - Corn-ethanol to energy grasses (1000 tC02e/y)  Carbon sink potential - Moderate deployment - Cropland measures (1000 tC02e/y)  Carbon sink potential - Moderate deployment - Permanent conservation cover (1000 tC02e/y)  Carbon sink potential - Moderate deployment - Total (1000 tC02e/y)  Land impacted for carbon sink - Aggressive deployment - Corn-ethanol to energy grasses
Carbon sink potential - Moderate deployment - Corn-ethanol to energy grasses (1000 tC02e/y)  Carbon sink potential - Moderate deployment - Cropland measures (1000 tC02e/y)  Carbon sink potential - Moderate deployment - Permanent conservation cover (1000 tC02e/y)  Carbon sink potential - Moderate deployment - Total (1000 tC02e/y)  Land impacted for carbon sink - Aggressive deployment - Corn-ethanol to energy grasses
Corn-ethanol to energy grasses (1000 tCO2e/y)  Carbon sink potential - Moderate deployment - Cropland measures (1000 tCO2e/y)  Carbon sink potential - Moderate deployment - Permanent conservation cover (1000 tCO2e/y)  Carbon sink potential - Moderate deployment - Total (1000 tCO2e/y)  Land impacted for carbon sink - Aggressive deployment - Corn-ethanol to energy grasses
Carbon sink potential - Moderate deployment - 0 0 -164 Cropland measures (1000 tC02e/y)  Carbon sink potential - Moderate deployment - 0 0 -5.04 Permanent conservation cover (1000 tC02e/y)  Carbon sink potential - Moderate deployment - 0 0 -169 Total (1000 tC02e/y)  Land impacted for carbon sink - Aggressive 0 0 0 0 deployment - Corn-ethanol to energy grasses
Cropland measures (1000 tCO2e/y)  Carbon sink potential - Moderate deployment - Permanent conservation cover (1000 tCO2e/y)  Carbon sink potential - Moderate deployment - Total (1000 tCO2e/y)  Land impacted for carbon sink - Aggressive deployment - Corn-ethanol to energy grasses
Carbon sink potential - Moderate deployment - Permanent conservation cover (1000 tCO2e/y)  Carbon sink potential - Moderate deployment - Total (1000 tCO2e/y)  Land impacted for carbon sink - Aggressive deployment - Corn-ethanol to energy grasses
Permanent conservation cover (1000 tCO2e/y)  Carbon sink potential - Moderate deployment - 0 0 -169  Total (1000 tCO2e/y)  Land impacted for carbon sink - Aggressive 0 0 0 0 deployment - Corn-ethanol to energy grasses
Carbon sink potential - Moderate deployment - 0 0 -169 Total (1000 tC02e/y)  Land impacted for carbon sink - Aggressive 0 0 0 deployment - Corn-ethanol to energy grasses
Total (1000 tC02e/y)  Land impacted for carbon sink - Aggressive 0 0 0  deployment - Corn-ethanol to energy grasses
Land impacted for carbon sink - Aggressive 0 0 0 deployment - Corn-ethanol to energy grasses
deployment - Corn-ethanol to energy grasses
(1000 hastans)
(1000 hectares)
Land impacted for carbon sink - Aggressive 0 0 173
deployment - Cropland measures (1000
hectares)
Land impacted for carbon sink - Aggressive 0 0 18.3
deployment - Permanent conservation cover
(1000 hectares)
Land impacted for carbon sink - Aggressive 0 0 191
deployment - Total (1000 hectares)
Land impacted for carbon sink - Moderate 0 0 0
deployment - Corn-ethanol to energy grasses
(1000 hectares)

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

Item	2020	2025	2050
Land impacted for carbon sink - Moderate	0	0	91.1
deployment - Cropland measures (1000			
hectares)			
Land impacted for carbon sink - Moderate	0	0	9.16
deployment - Permanent conservation cover			
(1000 hectares)			
Land impacted for carbon sink - Moderate	0	0	100
deployment - Total (1000 hectares)			

Item	2020	2025	2050
Carbon sink potential - High - Accelerate	0	0	107
regeneration (1000 tCO2e/y)			
Carbon sink potential - High - All (not counting overlap) (1000 tC02e/y)	0	0	26,905
Carbon sink potential - High - Avoid deforestation (1000 tCO2e/y)	0	0	538
Carbon sink potential - High - Extend rotation length (1000 tC02e/y)	0	0	10,590
Carbon sink potential - High - Improve plantations (1000 tC02e/y)	0	0	309
Carbon sink potential - High - Increase retention	0	0	10,909
of HWP (1000 tCO2e/y)			10,707
Carbon sink potential - High - Increase trees outside forests (1000 tC02e/y)	0	0	133
Carbon sink potential - High - Reforest cropland (1000 tCO2e/y)	0	0	401
Carbon sink potential - High - Reforest pasture (1000 tCO2e/y)	0	0	373
Carbon sink potential - High - Restore productivity (1000 tC02e/y)	0	0	3,545
Carbon sink potential - Low - Accelerate regeneration (1000 tCO2e/y)	0	0	53.7
Carbon sink potential - Low - All (not counting	0	0	9,475
overlap) (1000 tC02e/y) Carbon sink potential - Low - Avoid deforestation	0	0	89.7
(1000 tCO2e/y)  Carbon sink potential - Low - Extend rotation	0	0	4,068
length (1000 tC02e/y)			
Carbon sink potential - Low - Improve plantations (1000 tCO2e/y)	0	0	157
Carbon sink potential - Low - Increase retention of HWP (1000 tCO2e/y)	0	0	3,636
Carbon sink potential - Low - Increase trees outside forests (1000 tCO2e/y)	0	0	46.4
Carbon sink potential - Low - Reforest cropland (1000 tCO2e/y)	0	0	201
Carbon sink potential - Low - Reforest pasture (1000 tC02e/y)	0	0	28.2
Carbon sink potential - Low - Restore productivity (1000 tC02e/y)	0	0	1,195
Carbon sink potential - Mid - Accelerate regeneration (1000 tCO2e/y)	0	0	80.5
Carbon sink potential - Mid - All (not counting overlap) (1000 tC02e/y)	0	0	18,187
Carbon sink potential - Mid - Avoid deforestation	0	0	314
(1000 tC02e/y)  Carbon sink potential - Mid - Extend rotation	0	0	7,329
length (1000 tC02e/y) Carbon sink potential - Mid - Improve plantations (1000 tC02e/y)	0	0	230
Carbon sink potential - Mid - Increase retention of HWP (1000 tCO2e/y)	0	0	7,273

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

Team	Table 13: E+ scenario - PILLAR 6: Land sinks - Fo	rests (contin	ued)	
Dutside forests (1000 tC02e/y)   Carbon sink potential - Mid - Reforest cropland (1000 tC02e/y)   Carbon sink potential - Mid - Reforest pasture (1000 tC02e/y)   Carbon sink potential - Mid - Restore productivity (1000 tC02e/y)   Carbon sink potential - Mid - Restore productivity (1000 tC02e/y)   Carbon sink potential - Mid - Restore productivity (1000 tC02e/y)   Carbon sink potential - Migh - Accelerate regeneration (1000 hectares)   Carbon sink potential - High - Accelerate regeneration (1000 hectares)   Carbon sink potential - High - Accelerate regeneration (1000 hectares)   Carbon sink potential - High - Avoid deforestation (over 30 years) (1000 hectares)   Carbon sink potential - High - Carbon sink potential - High - Carbon sink potential - High - Improve plantations (1000 hectares)   Carbon sink potential - High - Carbon sink potential - Low - Carbon sink potenti		2020	2025	2050
Carbon sink potential - Mid - Reforest cropland   0		0	0	89.4
Carbon sink potential - Mid - Reforest pasture   0   0   200   (1000 tcO2e/y)   Carbon sink potential - Mid - Restore productivity (1000 tcO2e/y)   0   0   2,370   2,370   0   2,370	outside forests (1000 tCO2e/y)			
Carbon sink potential - Mid - Reforest pasture   0	Carbon sink potential - Mid - Reforest cropland	0	0	301
Carbon sink potential - Mid - Restore				
Carbon sink potential - Mid - Restore productivity (1000 tCO2e/v)   2,370	Carbon sink potential - Mid - Reforest pasture	0	0	200
Decounts				
Decounts	Carbon sink potential - Mid - Restore	0	0	2,370
Land impacted for carbon sink potential - High - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - High - Avoid deforestation (over 30 years) (1000 hectares)  Land impacted for carbon sink potential - High - Extend rotation length (1000 hectares)  Land impacted for carbon sink potential - High - O O O O O O O O O O O O O O O O O O				
Land impacted for carbon sink potential - High -	Land impacted for carbon sink potential - High -	0	0	17.5
Land impacted for carbon sink potential - High -				
Avoid deforestation (over 30 years) (1000 hectares)  Land impacted for carbon sink potential - High - Extend rotation length (1000 hectares)  Land impacted for carbon sink potential - High - Improve plantations (1000 hectares)  Land impacted for carbon sink potential - High - Increase retention of HWP (1000 hectares)  Land impacted for carbon sink potential - High - Increase retention of HWP (1000 hectares)  Land impacted for carbon sink potential - High - Increase trees outside forests (1000 hectares)  Land impacted for carbon sink potential - High - Increase trees outside forests (1000 hectares)  Land impacted for carbon sink potential - High - Increase trees outside forests (1000 hectares)  Land impacted for carbon sink potential - High - Important of the potential - Low - Important of the potential - Mid - Important of the pote		0	0	72.9
Land impacted for carbon sink potential - High -	•			
Extend rotation length (1000 hectares)				
Extend rotation length (1000 hectares) Land impacted for carbon sink potential - High- Improve plantations (1000 hectares) Land impacted for carbon sink potential - High - Increase retention of HWP (1000 hectares) Land impacted for carbon sink potential - High - Increase retention of HWP (1000 hectares) Land impacted for carbon sink potential - High - Increase trees outside forests (1000 hectares) Land impacted for carbon sink potential - High - Reforest cropland (1000 hectares) Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares) Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares) Land impacted for carbon sink potential - High - Restore productivity (1000 hectares) Land impacted for carbon sink potential - High - Total impacted (over 30 years) (1000 hectares) Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares) Land impacted for carbon sink potential - Low - Avoid deforestation (over 30 years) (1000 hectares) Land impacted for carbon sink potential - Low - Avoid deforestation (over 30 years) (1000 hectares) Land impacted for carbon sink potential - Low - Extend rotation length (1000 hectares) Land impacted for carbon sink potential - Low - Improve plantations (1000 hectares) Land impacted for carbon sink potential - Low - Increase retention of HWP (1000 hectares) Land impacted for carbon sink potential - Low - Increase retention of HWP (1000 hectares) Land impacted for carbon sink potential - Low - Reforest cropland (1000 hectares) Land impacted for carbon sink potential - Low - Reforest cropland (1000 hectares) Land impacted for carbon sink potential - Low - Reforest cropland (1000 hectares) Land impacted for carbon sink potential - Low - Reforest pasture (1000 hectares) Land impacted for carbon sink potential - Low - Reforest cropland (1000 hectares) Land impacted for carbon sink potential - Mid - Avoid deforestation (over 30 years) (1000 hectares) Land impacted for carbon sink potential - Mid - Avoid deforestation		0	0	5,400
Land impacted for carbon sink potential - High - Improve plantations (1000 hectares)   Decided to the provided to the provid				,
Improve plantations (1000 hectares)		0	0	114
Land impacted for carbon sink potential - High - Increase retention of HWP (1000 hectares)   Comparison of the HWP (1000 hectares)   Comparison sink potential - High - Increase trees outside forests (1000 hectares)   Comparison sink potential - High - Increase trees outside forests (1000 hectares)   Comparison sink potential - High - Reforest cropland (1000 hectares)   Comparison sink potential - High - Reforest cropland (1000 hectares)   Comparison sink potential - High - Reforest pasture (1000 hectares)   Comparison sink potential - High - Restore productivity (1000 hectares)   Comparison sink potential - High - Comparison sink potential - High - Comparison sink potential - High - Comparison sink potential - Low - Comparison sink potential - Mid - Comparison sink potential				
Increase retention of HWP (1000 hectares)		0	0	0
Land impacted for carbon sink potential - High -			<u> </u>	0
Increase trees outside forests (1000 hectares)   Land impacted for carbon sink potential - High - Reforest cropland (1000 hectares)   Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares)   Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares)   Land impacted for carbon sink potential - High - Restore productivity (1000 hectares)   Land impacted for carbon sink potential - High - Restore productivity (1000 hectares)   Land impacted (over 30 years) (1000 hectares)   Land impacted for carbon sink potential - Low - Received for carbon sink potential - Low - Received for carbon sink potential - Low - Reforest continuous received for carbon sink potential - Low - Reforest continuous received for carbon sink potential - Low - Reforest continuous received for carbon sink potential - Low - Reforest continuous received for carbon sink potential - Low - Reforest continuous received for carbon sink potential - Low - Reforest continuous received for carbon sink potential - Low - Reforest compland (1000 hectares)   Land impacted for carbon sink potential - Low - Reforest cropland (1000 hectares)   Land impacted for carbon sink potential - Low - Reforest cropland (1000 hectares)   Land impacted for carbon sink potential - Low - Reforest poutside for carbon sink potential - Low - Reforest poutside for carbon sink potential - Low - Reforest poutside for carbon sink potential - Low - Reforest poutside for carbon sink potential - Low - Reforest poutside for carbon sink potential - Low - Reforest poutside for carbon sink potential - Low - Reforest poutside for carbon sink potential - Low - Reforest cropland (1000 hectares)   Land impacted for carbon sink potential - Mid - Restore productivity (1000 hectares)   Land impacted for carbon sink potential - Mid - Restore productivity (1000 hectares)   Land impacted for carbon sink potential - Mid - Restore productivity (1000 hectares)   Land impacted for carbon sink potential - Mid - Restore plantations (1000 hectares)   Land im		n	0	12.6
Land impacted for carbon sink potential - High - Reforest cropland (1000 hectares) Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares) Land impacted for carbon sink potential - High - Restore productivity (1000 hectares) Land impacted for carbon sink potential - High - Restore productivity (1000 hectares) Land impacted for carbon sink potential - High - Total impacted (over 30 years) (1000 hectares) Land impacted for carbon sink potential - Low - Restore productivity (1000 hectares) Land impacted for carbon sink potential - Low - Restore productivity (1000 hectares) Land impacted for carbon sink potential - Low - Restore productivity (1000 hectares) Land impacted for carbon sink potential - Low - Restore productivity (1000 hectares) Land impacted for carbon sink potential - Low - Restore productivity (1000 hectares) Land impacted for carbon sink potential - Low - Restore productivity (1000 hectares) Land impacted for carbon sink potential - Low - Restore productivity (1000 hectares) Land impacted for carbon sink potential - Low - Restorest cropland (1000 hectares) Land impacted for carbon sink potential - Low - Restorest cropland (1000 hectares) Land impacted for carbon sink potential - Low - Restorest cropland (1000 hectares) Land impacted for carbon sink potential - Low - Restore productivity (1000 hectares) Land impacted for carbon sink potential - Low - Restore productivity (1000 hectares) Land impacted for carbon sink potential - Low - Restore productivity (1000 hectares) Land impacted for carbon sink potential - Low - Restore productivity (1000 hectares) Land impacted for carbon sink potential - Low - Restore productivity (1000 hectares) Land impacted for carbon sink potential - Mid - Restore productivity (1000 hectares) Land impacted for carbon sink potential - Mid - Restore productivity (1000 hectares) Land impacted for carbon sink potential - Mid - Restore productivity (1000 hectares) Land impacted for carbon sink potential - Mid - Restore plantations (1000 hectares) Land			0	12.0
Reforest cropland (1000 hectares)   Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares)   Land impacted for carbon sink potential - High - Restore productivity (1000 hectares)   Land impacted for carbon sink potential - High - Total impacted for carbon sink potential - High - Total impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)   Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)   Land impacted for carbon sink potential - Low - Avoid deforestation (over 30 years) (1000 hectares)   Land impacted for carbon sink potential - Low - Avoid deforestation (over 30 years) (1000 hectares)   Land impacted for carbon sink potential - Low - Lo		0	0	24.5
Land impacted for carbon sink potential - High - Reforest pasture (1000 hectares)  Land impacted for carbon sink potential - High - Restore productivity (1000 hectares)  Land impacted for carbon sink potential - High - Restore productivity (1000 hectares)  Land impacted for carbon sink potential - High - O O O O O O O O O O O O O O O O O O		0	0	20.5
Reforest pasture (1000 hectares)  Land impacted for carbon sink potential - High - Restore productivity (1000 hectares)  Land impacted for carbon sink potential - High - Total impacted (over 30 years) (1000 hectares)  Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - Low - Avoid deforestation (over 30 years) (1000 hectares)  Land impacted for carbon sink potential - Low - Avoid deforestation (over 30 years) (1000 hectares)  Land impacted for carbon sink potential - Low - O O O O O O O O O O O O O O O O O O		0	0	10.7
Land impacted for carbon sink potential - High - Restore productivity (1000 hectares)  Land impacted for carbon sink potential - High - Total impacted for carbon sink potential - High - Total impacted (over 30 years) (1000 hectares)  Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - Low - Avoid deforestation (over 30 years) (1000 hectares)  Land impacted for carbon sink potential - Low - Avoid deforestation (over 30 years) (1000 hectares)  Land impacted for carbon sink potential - Low - December 2		0	U	10.6
Restore productivity (1000 hectares)   Land impacted for carbon sink potential - High - Total impacted (over 30 years) (1000 hectares)   Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)   Land impacted for carbon sink potential - Low - Avoid deforestation (over 30 years) (1000 hectares)   Land impacted for carbon sink potential - Low - Avoid deforestation (over 30 years) (1000 hectares)   Land impacted for carbon sink potential - Low - Extend rotation length (1000 hectares)   Land impacted for carbon sink potential - Low - Improve plantations (1000 hectares)   Land impacted for carbon sink potential - Low - Increase retention of HWP (1000 hectares)   Land impacted for carbon sink potential - Low - Increase trees outside forests (1000 hectares)   Land impacted for carbon sink potential - Low - O O O O O O O O O O O O O O O O O O		0	0	1 175
Land impacted for carbon sink potential - High - Total impacted (over 30 years) (1000 hectares)  Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - Low - Avoid deforestation (over 30 years) (1000 hectares)  Land impacted for carbon sink potential - Low - Avoid deforestation (over 30 years) (1000 hectares)  Land impacted for carbon sink potential - Low - Detail of the provided for carbon sink potential - Low - Detail of the provided for carbon sink potential - Low - Detail of the provided for carbon sink potential - Low - Detail of the provided for carbon sink potential - Low - Detail of the provided for carbon sink potential - Low - Detail of the provided for carbon sink potential - Low - Detail of the provided for carbon sink potential - Low - Detail of the provided for carbon sink potential - Low - Detail of the provided for carbon sink potential - Low - Detail of the provided for carbon sink potential - Low - Detail of the provided for carbon sink potential - Low - Detail of the provided for carbon sink potential - Low - Detail of the provided for carbon sink potential - Low - Detail of the provided for carbon sink potential - Low - Detail of the provided for carbon sink potential - Low - Detail of the provided for carbon sink potential - Low - Detail of the provided for carbon sink potential - Mid - Detail Detail of the provided deforestation (1000 hectares) - Detail Detail of the provided deforestation (1000 hectares) - Detail Detail of the provided deforestation (1000 hectares) - Detail of the provided deforestation (1000 hectares) - Detail Detail of the provided for carbon sink potential - Mid - Detail Detail of the provided for carbon sink potential - Mid - Detail Detail of the provided for carbon sink potential - Mid - Detail Detail of the provided for carbon sink potential - Mid - Detail of the provided for carbon sink potential - Mid - Detail of the provided for carbon sink potential - Mid - Detail of the provided for car		U	U	1,175
Total impacted (over 30 years) (1000 hectares)  Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - Low - O O O O O O O O O O O O O O O O O O				
Land impacted for carbon sink potential - Low - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - Low - Avoid deforestation (over 30 years) (1000 hectares)  Land impacted for carbon sink potential - Low - Dextend rotation length (1000 hectares)  Land impacted for carbon sink potential - Low - Dextend rotation length (1000 hectares)  Land impacted for carbon sink potential - Low - Dextend impacted for carbon sink potential - Low - Dextend impacted for carbon sink potential - Low - Dextend impacted for carbon sink potential - Low - Dextend impacted for carbon sink potential - Low - Dextend impacted for carbon sink potential - Low - Dextend impacted for carbon sink potential - Low - Dextend impacted for carbon sink potential - Low - Dextend impacted for carbon sink potential - Low - Dextend impacted for carbon sink potential - Low - Dextend impacted for carbon sink potential - Low - Dextend impacted for carbon sink potential - Low - Dextend impacted for carbon sink potential - Low - Dextend impacted for carbon sink potential - Low - Dextend impacted for carbon sink potential - Low - Dextend impacted (over 30 years) (1000 hectares)  Land impacted for carbon sink potential - Mid - Dextend impacted for carbon sink potential - Mid - Dextend impacted for carbon sink potential - Mid - Dextend impacted for carbon sink potential - Mid - Dextend impacted for carbon sink potential - Mid - Dextend impacted for carbon sink potential - Mid - Dextend impacted for carbon sink potential - Mid - Dextend impacted for carbon sink potential - Mid - Dextend impacted for carbon sink potential - Mid - Dextend impacted for carbon sink potential - Mid - Dextend impacted for carbon sink potential - Mid - Dextend impacted for carbon sink potential - Mid - Dextend impacted for carbon sink potential - Mid - Dextend impacted for carbon sink potential - Mid - Dextend impacted for carbon sink potential - Mid - Dextend impacted for carbon sink potential - Mid - Dextend impacted for carbon sink potential - Mid - De		U	U	6,829
Accelerate regeneration (1000 hectares) Land impacted for carbon sink potential - Low -		_	_	
Land impacted for carbon sink potential - Low - Avoid deforestation (over 30 years) (1000 hectares)  Land impacted for carbon sink potential - Low - Extend rotation length (1000 hectares)  Land impacted for carbon sink potential - Low - Description of the potential - Low - Description of HWP (1000 hectares)  Land impacted for carbon sink potential - Low - Description of HWP (1000 hectares)  Land impacted for carbon sink potential - Low - Description of HWP (1000 hectares)  Land impacted for carbon sink potential - Low - Description of the potential - Low - Description of the potential - Low - Description of HWP (1000 hectares)  Land impacted for carbon sink potential - Low - Description of the potential - Mid - Description of Descriptio		0	0	8.77
Avoid deforestation (over 30 years) (1000 hectares)  Land impacted for carbon sink potential - Low - Extend rotation length (1000 hectares)  Land impacted for carbon sink potential - Low - 0 0 56.9  Improve plantations (1000 hectares)  Land impacted for carbon sink potential - Low - 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				
hectares) Land impacted for carbon sink potential - Low -		0	0	68.4
Land impacted for carbon sink potential - Low - Extend rotation length (1000 hectares)  Land impacted for carbon sink potential - Low - Improve plantations (1000 hectares)  Land impacted for carbon sink potential - Low - Increase retention of HWP (1000 hectares)  Land impacted for carbon sink potential - Low - Increase trees outside forests (1000 hectares)  Land impacted for carbon sink potential - Low - Increase trees outside forests (1000 hectares)  Land impacted for carbon sink potential - Low - Reforest cropland (1000 hectares)  Land impacted for carbon sink potential - Low - Reforest pasture (1000 hectares)  Land impacted for carbon sink potential - Low - Restore productivity (1000 hectares)  Land impacted for carbon sink potential - Low - Total impacted (over 30 years) (1000 hectares)  Land impacted for carbon sink potential - Mid - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - Mid - Avoid deforestation (over 30 years) (1000 hectares)  Land impacted for carbon sink potential - Mid - Avoid deforestation (over 30 years) (1000 hectares)  Land impacted for carbon sink potential - Mid - Avoid deforestation (over 30 years) (1000 hectares)  Land impacted for carbon sink potential - Mid - Improve plantations (1000 hectares)  Land impacted for carbon sink potential - Mid - Improve plantations (1000 hectares)  Land impacted for carbon sink potential - Mid - Increase retention of HWP (1000 hectares)  Land impacted for carbon sink potential - Mid - Increase retention of HWP (1000 hectares)				
Extend rotation length (1000 hectares)  Land impacted for carbon sink potential - Low - Improve plantations (1000 hectares)  Land impacted for carbon sink potential - Low - Increase retention of HWP (1000 hectares)  Land impacted for carbon sink potential - Low - Increase trees outside forests (1000 hectares)  Land impacted for carbon sink potential - Low - Increase trees outside forests (1000 hectares)  Land impacted for carbon sink potential - Low - Increase trees outside forests (1000 hectares)  Land impacted for carbon sink potential - Low - Increase trees outside forest (1000 hectares)  Land impacted for carbon sink potential - Low - Increase trees outside for carbon sink potential - Low - Increase trees outside for carbon sink potential - Low - Increase trees outside for carbon sink potential - Low - Increase trees outside for carbon sink potential - Mid - Increase retention of HWP (1000 hectares)  Land impacted for carbon sink potential - Mid - Increase retention of HWP (1000 hectares)  Land impacted for carbon sink potential - Mid - Increase retention of HWP (1000 hectares)  Land impacted for carbon sink potential - Mid - Increase retention of HWP (1000 hectares)  Land impacted for carbon sink potential - Mid - Increase retention of HWP (1000 hectares)  Land impacted for carbon sink potential - Mid - Increase retention of HWP (1000 hectares)  Land impacted for carbon sink potential - Mid - Increase retention of HWP (1000 hectares)				
Land impacted for carbon sink potential - Low - Improve plantations (1000 hectares)  Land impacted for carbon sink potential - Low - Increase retention of HWP (1000 hectares)  Land impacted for carbon sink potential - Low - Increase trees outside forests (1000 hectares)  Land impacted for carbon sink potential - Low - Increase trees outside forests (1000 hectares)  Land impacted for carbon sink potential - Low - Increase trees outside forests (1000 hectares)  Land impacted for carbon sink potential - Low - Increase trees outside forests (1000 hectares)  Land impacted for carbon sink potential - Low - Increase trees of Increase (1000 hectares)  Land impacted for carbon sink potential - Low - Increase (1000 hectares)  Land impacted for carbon sink potential - Low - Increase (1000 hectares)  Land impacted for carbon sink potential - Mid - Increase retention (1000 hectares)  Land impacted for carbon sink potential - Mid - Increase retention of HWP (1000 hectares)  Land impacted for carbon sink potential - Mid - Increase retention of HWP (1000 hectares)  Land impacted for carbon sink potential - Mid - Increase retention of HWP (1000 hectares)  Land impacted for carbon sink potential - Mid - Increase retention of HWP (1000 hectares)  Land impacted for carbon sink potential - Mid - Increase retention of HWP (1000 hectares)  Land impacted for carbon sink potential - Mid - Increase retention of HWP (1000 hectares)	·	0	0	2,069
Improve plantations (1000 hectares)  Land impacted for carbon sink potential - Low - Increase retention of HWP (1000 hectares)  Land impacted for carbon sink potential - Low - O O O O O O O O O O O O O O O O O O				
Land impacted for carbon sink potential - Low - Increase retention of HWP (1000 hectares)  Land impacted for carbon sink potential - Low - Increase trees outside forests (1000 hectares)  Land impacted for carbon sink potential - Low - O O O O O O O O O O O O O O O O O O		0	0	56.9
Increase retention of HWP (1000 hectares)  Land impacted for carbon sink potential - Low -	Improve plantations (1000 hectares)			
Land impacted for carbon sink potential - Low - Increase trees outside forests (1000 hectares)  Land impacted for carbon sink potential - Low - Reforest cropland (1000 hectares)  Land impacted for carbon sink potential - Low - Reforest pasture (1000 hectares)  Land impacted for carbon sink potential - Low - Restore productivity (1000 hectares)  Land impacted for carbon sink potential - Low - O O O O O O O O O O O O O O O O O O		0	0	0
Increase trees outside forests (1000 hectares)  Land impacted for carbon sink potential - Low - Reforest cropland (1000 hectares)  Land impacted for carbon sink potential - Low - Reforest pasture (1000 hectares)  Land impacted for carbon sink potential - Low - Restore productivity (1000 hectares)  Land impacted for carbon sink potential - Low - OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO	Increase retention of HWP (1000 hectares)			
Land impacted for carbon sink potential - Low - Reforest cropland (1000 hectares)  Land impacted for carbon sink potential - Low - Reforest pasture (1000 hectares)  Land impacted for carbon sink potential - Low - Restore productivity (1000 hectares)  Land impacted for carbon sink potential - Low - Restore productivity (1000 hectares)  Land impacted for carbon sink potential - Low - Restore productivity (1000 hectares)  Land impacted (over 30 years) (1000 hectares)  Land impacted for carbon sink potential - Mid - Restore regeneration (1000 hectares)  Land impacted for carbon sink potential - Mid - Restore restore to a sink potential - Mid - Restore restore restore to a sink potential - Mid - Restore re	Land impacted for carbon sink potential - Low -	0	0	6.63
Reforest cropland (1000 hectares)  Land impacted for carbon sink potential - Low - Reforest pasture (1000 hectares)  Land impacted for carbon sink potential - Low - Restore productivity (1000 hectares)  Land impacted for carbon sink potential - Low - O O O O O O O O O O O O O O O O O O				
Land impacted for carbon sink potential - Low - Reforest pasture (1000 hectares)  Land impacted for carbon sink potential - Low - Restore productivity (1000 hectares)  Land impacted for carbon sink potential - Low - O O O O O O O O O O O O O O O O O O	Land impacted for carbon sink potential - Low -	0	0	13.3
Reforest pasture (1000 hectares)  Land impacted for carbon sink potential - Low - Restore productivity (1000 hectares)  Land impacted for carbon sink potential - Low - O O O O O O O O O O O O O O O O O O	Reforest cropland (1000 hectares)			
Land impacted for carbon sink potential - Low - Restore productivity (1000 hectares)  Land impacted for carbon sink potential - Low - Total impacted (over 30 years) (1000 hectares)  Land impacted for carbon sink potential - Mid - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - Mid - Avoid deforestation (over 30 years) (1000 hectares)  Land impacted for carbon sink potential - Mid - Extend rotation length (1000 hectares)  Land impacted for carbon sink potential - Mid - Improve plantations (1000 hectares)  Land impacted for carbon sink potential - Mid - Increase retention of HWP (1000 hectares)  Land impacted for carbon sink potential - Mid - Increase retention of HWP (1000 hectares)  Land impacted for carbon sink potential - Mid - Increase retention of HWP (1000 hectares)  Land impacted for carbon sink potential - Mid - Increase retention of HWP (1000 hectares)  Land impacted for carbon sink potential - Mid - Increase retention of HWP (1000 hectares)	Land impacted for carbon sink potential - Low -	0	0	1.84
Restore productivity (1000 hectares)  Land impacted for carbon sink potential - Low - Total impacted (over 30 years) (1000 hectares)  Land impacted for carbon sink potential - Mid - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - Mid - Avoid deforestation (over 30 years) (1000 hectares)  Land impacted for carbon sink potential - Mid - Extend rotation length (1000 hectares)  Land impacted for carbon sink potential - Mid - Improve plantations (1000 hectares)  Land impacted for carbon sink potential - Mid - Increase retention of HWP (1000 hectares)  Land impacted for carbon sink potential - Mid - Increase retention of HWP (1000 hectares)  Land impacted for carbon sink potential - Mid - Increase retention of HWP (1000 hectares)  Land impacted for carbon sink potential - Mid - Increase retention of HWP (1000 hectares)  Land impacted for carbon sink potential - Mid - Increase retention of HWP (1000 hectares)	Reforest pasture (1000 hectares)			
Restore productivity (1000 hectares)  Land impacted for carbon sink potential - Low - Total impacted (over 30 years) (1000 hectares)  Land impacted for carbon sink potential - Mid - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - Mid - Avoid deforestation (over 30 years) (1000 hectares)  Land impacted for carbon sink potential - Mid - Extend rotation length (1000 hectares)  Land impacted for carbon sink potential - Mid - Improve plantations (1000 hectares)  Land impacted for carbon sink potential - Mid - Increase retention of HWP (1000 hectares)  Land impacted for carbon sink potential - Mid - Increase retention of HWP (1000 hectares)  Land impacted for carbon sink potential - Mid - Increase retention of HWP (1000 hectares)  Land impacted for carbon sink potential - Mid - Increase retention of HWP (1000 hectares)  Land impacted for carbon sink potential - Mid - Increase retention of HWP (1000 hectares)		0	0	711
Land impacted for carbon sink potential - Low - Total impacted (over 30 years) (1000 hectares)  Land impacted for carbon sink potential - Mid - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - Mid - Avoid deforestation (over 30 years) (1000 hectares)  Land impacted for carbon sink potential - Mid - Extend rotation length (1000 hectares)  Land impacted for carbon sink potential - Mid - Improve plantations (1000 hectares)  Land impacted for carbon sink potential - Mid - Increase retention of HWP (1000 hectares)  Land impacted for carbon sink potential - Mid - Increase retention of HWP (1000 hectares)  Land impacted for carbon sink potential - Mid - Increase retention of HWP (1000 hectares)  Land impacted for carbon sink potential - Mid - Increase retention of HWP (1000 hectares)				
Total impacted (over 30 years) (1000 hectares)  Land impacted for carbon sink potential - Mid -		0	0	2.936
Land impacted for carbon sink potential - Mid - Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - Mid - O O O O O O O O O O O O O O O O O O				_,,,,,
Accelerate regeneration (1000 hectares)  Land impacted for carbon sink potential - Mid -		0	0	13.2
Land impacted for carbon sink potential - Mid - Avoid deforestation (over 30 years) (1000 hectares)  Land impacted for carbon sink potential - Mid - Extend rotation length (1000 hectares)  Land impacted for carbon sink potential - Mid - Improve plantations (1000 hectares)  Land impacted for carbon sink potential - Mid - Increase retention of HWP (1000 hectares)  Land impacted for carbon sink potential - Mid - Increase retention of HWP (1000 hectares)  Land impacted for carbon sink potential - Mid - O O 9.61				.0.2
Avoid deforestation (over 30 years) (1000 hectares)  Land impacted for carbon sink potential - Mid -		0	0	70.6
hectares)  Land impacted for carbon sink potential - Mid -			0	10.0
Land impacted for carbon sink potential - Mid -				
Extend rotation length (1000 hectares)  Land impacted for carbon sink potential - Mid - 0 0 85.7  Improve plantations (1000 hectares)  Land impacted for carbon sink potential - Mid - 0 0 0  Increase retention of HWP (1000 hectares)  Land impacted for carbon sink potential - Mid - 0 0 9.61		n	n	272/.
Land impacted for carbon sink potential - Mid - 0 0 85.7  Improve plantations (1000 hectares)  Land impacted for carbon sink potential - Mid - 0 0 0  Increase retention of HWP (1000 hectares)  Land impacted for carbon sink potential - Mid - 0 0 9.61		"	U	3,134
Improve plantations (1000 hectares)  Land impacted for carbon sink potential - Mid - 0 0 0  Increase retention of HWP (1000 hectares)  Land impacted for carbon sink potential - Mid - 0 0 9.61		0	0	05.7
Land impacted for carbon sink potential - Mid - 0 0 0 Increase retention of HWP (1000 hectares) Land impacted for carbon sink potential - Mid - 0 0 9.61		U	U	7.08
Increase retention of HWP (1000 hectares)  Land impacted for carbon sink potential - Mid - 0 9.61				
Land impacted for carbon sink potential - Mid - 0 9.61		U	U	U
				0.11
THE THE SOUTSIDE TO PESTS (1000 NECTA PEST)		U	U	9.61
	increase trees outside forests (1000 hectares)			

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

Item	2020	2025	2050
Land impacted for carbon sink potential - Mid -	0	0	19.9
Reforest cropland (1000 hectares)			
Land impacted for carbon sink potential - Mid -	0	0	13.3
Reforest pasture (1000 hectares)			
Land impacted for carbon sink potential - Mid -	0	0	1,432
Restore productivity (1000 hectares)			
Land impacted for carbon sink potential - Mid -	0	0	5,379
Total impacted (over 30 years) (1000 hectares)			

#### Table 14: E+ scenario - IMPACTS - Health

Item	2020	2025	2030	2035	2040	2045	2050
Monetary damages from air pollution - Coal (million 2019\$)	0	125	0.148	0.147	0.14	0.083	0.004
Monetary damages from air pollution - Natural Gas (million 2019\$)	0	35	19.7	12.6	11.6	7.15	3.33
Monetary damages from air pollution - Transportation (million 2019\$)	0	163	149	111	62.7	27.6	10.1
Premature deaths from air pollution - Coal (deaths)	0	14	0.017	0.017	0.016	0.009	0
Premature deaths from air pollution - Natural Gas (deaths)	0	3.96	2.23	1.42	1.31	0.807	0.376
Premature deaths from air pollution - Transportation (deaths)	0	18.4	16.8	12.5	7.05	3.11	1.14

# Table 15: E+ scenario - IMPACTS - Jobs

Item	2020	2025	2030	2035	2040	2045	2050
By economic sector - Agriculture (jobs)	208	239	499	219	173	129	249
By economic sector - Construction (jobs)	1,460	1,355	1,129	1,060	1,250	3,284	25,058
By economic sector - Manufacturing (jobs)	827	1,081	1,609	1,419	1,554	2,377	6,655
By economic sector - Mining (jobs)	794	648	485	333	220	145	94.3
By economic sector - Other (jobs)	133	120	82.8	92.9	112	295	2,892
By economic sector - Pipeline (jobs)	99.9	98.9	121	72.1	70.3	56.4	70.6
By economic sector - Professional (jobs)	1,146	1,236	1,126	763	790	1,963	14,696
By economic sector - Trade (jobs)	789	771	608	502	491	1,100	8,347
By economic sector - Utilities (jobs)	859	896	767	786	1,279	3,800	28,080
By education level - All sectors - Associates	1,835	1,878	1,835	1,561	1,834	4,211	28,051
degree or some college (jobs)							
By education level - All sectors - Bachelors	1,442	1,471	1,398	1,110	1,218	2,649	17,210
degree (jobs)							
By education level - All sectors - Doctoral degree	57.9	59.8	54.3	38.8	40	90.9	644
(jobs)							
By education level - All sectors - High school	2,624	2,670	2,798	2,275	2,560	5,544	35,775
diploma or less (jobs)							
By education level - All sectors - Masters or	358	366	341	263	288	655	4,462
professional degree (jobs)							
By resource sector - Biomass (jobs)	861	1,028	1,375	623	520	472	1,063
By resource sector - CO2 (jobs)	0	0	272	0	112	111	313
By resource sector - Grid (jobs)	1,228	1,095	853	1,349	1,965	7,333	56,654
By resource sector - Natural Gas (jobs)	524	701	421	242	523	296	262
By resource sector - Nuclear (jobs)	0	0	0	0	0	0	0
By resource sector - Oil (jobs)	2,096	1,867	1,546	1,179	872	650	481
By resource sector - Solar (jobs)	966	985	948	666	878	1,418	6,882
By resource sector - Wind (jobs)	641	769	1,012	1,188	1,071	2,870	20,488
Median wages - Annual - All (\$2019 per job)	57,131	57,717	57,407	57,892	58,493	59,594	60,830
On-Site or In-Plant Training - Total jobs - 1 to 4	971	984	959	811	945	2,166	14,470
years (jobs)							
On-Site or In-Plant Training - Total jobs - 4 to 10	394	392	356	305	366	894	6,362
years (jobs)							
On-Site or In-Plant Training - Total jobs - None	1,051	1,076	1,080	864	966	2,107	13,716
(jobs)							

Table 15:	E+ scenario -	IMPACTS	Johs	(continued)
Table 10.	L' SCCHUITO	11'11 7010		i Continuaca.

Item	2020	2025	2030	2035	2040	2045	2050
On-Site or In-Plant Training - Total jobs - Over 10	47.4	48.8	47	40.8	49.5	118	807
years (jobs)							
On-Site or In-Plant Training - Total jobs - Up to 1	3,853	3,944	3,985	3,226	3,613	7,864	50,787
year (jobs)							
On-the-Job Training - All sectors - 1 to 4 years	1,236	1,251	1,208	1,027	1,207	2,796	18,808
_(jobs)							
On-the-Job Training - All sectors - 4 to 10 years	373	371	335	290	354	884	6,380
(jobs)							
On-the-Job Training - All sectors - None (jobs)	363	366	353	285	314	683	4,496
On-the-Job Training - All sectors - Over 10 years	59.1	60.4	60.5	51.4	57.8	122	751
(jobs)							
On-the-Job Training - All sectors - Up to 1 year	4,286	4,396	4,470	3,594	4,008	8,666	55,708
(jobs)							
Related work experience - All sectors - 1 to 4	2,310	2,351	2,323	1,890	2,132	4,726	31,063
years (jobs)							
Related work experience - All sectors - 4 to 10	1,453	1,479	1,425	1,182	1,357	3,072	20,371
years (jobs)							
Related work experience - All sectors - None	893	913	925	753	860	1,903	12,539
(jobs)							
Related work experience - All sectors - Over 10	384	394	387	325	371	820	5,254
years (jobs)							
Related work experience - All sectors - Up to 1	1,276	1,308	1,366	1,096	1,219	2,629	16,916
year (jobs)							
Wage income - All (million \$2019)	361	372	369	304	347	784	5,241

# Table 16: E+ scenario - IMPACTS - Fossil fuel industries

Item	2020	2025	2030	2035	2040	2045	2050
Natural gas consumption - Annual (tcf)	35.4	36	30.3	24.3	18.3	11.5	7.99
Natural gas consumption - Cumulative (tcf)	0	0	0	0	0	0	732
Natural gas production - Annual (tcf)	0	0	0	0	0	0	0
Oil consumption - Annual (million bbls)	43	42	37.9	31.3	24.9	19.9	15.7
Oil consumption - Cumulative (million bbls)	0	0	0	0	0	0	956
Oil production - Annual (million bbls)	0	0	0	0	0	0	0

#### Table 17: E- scenario - PILLAR 1: Efficiency/Electrification - Residential

Item	2020	2025	2030	2035	2040	2045	2050
Residential HVAC investment in 2020s vs. REF -	0	1.25	1.38	0	0	0	0
Cumulative 5-yr (billion \$2018)							
Sales of cooking units - Electric Resistance (%)	64.1	65	68.3	77	89	96.5	99
Sales of cooking units - Gas (%)	35.9	35	31.7	23	11	3.54	0.953
Sales of space heating units - Electric Heat Pump	3	2.62	5.43	13.6	26.9	36.8	40.8
(%)							
Sales of space heating units - Electric Resistance	1.39	1.43	1.43	1.44	1.28	1.11	1.03
(%)							
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 Heat Pump	0	0.324	1.24	4.01	9.3	14.5	17.2
(%)							
Sales of water heating units - Electric Resistance	25.5	41.9	42.4	44.6	47.8	50.5	51.8
(%)							
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 18: E- scenario - PILLAR 1: Efficiency/Electrification - Transportation

Item	2020	2025	2030	2035	2040	2045	2050
Light-duty vehicle capital costs - Cumulative 5-yr	0	0	35	73.4	248	780	1,136
(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 18: E- scenario -	PTI I AR 1: Efficienc	v/Flectrification - `	Transnortation	(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 FC (%)	0.166	0.485	1.37	3.58	7.86	13.2	17
Vehicle sales - Medium-duty - other (%)	0.253	0.266	0.279	0.286	0.258	0.184	0.102

#### 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 - 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 Resistance (%)	36.9	40.7	44.7	56.5	72.7	82.9	86.4
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 Heat Pump	2.33	6.89	8.48	13.3	22.8	32.7	38.1
(%)							
Sales of space heating units - Electric Resistance	1.31	1.76	2.43	4.48	7.93	10.5	11.3
(%)							
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 Heat Pump	4.05	2.68	3.38	5.63	11.1	17.9	22
(%)							
Sales of water heating units - Electric Resistance	19.4	11.6	11.9	14.5	19.6	26	29.9
(%)							
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 21: E- scenario - PILLAR 1: Efficiency/Electrification - Electricity demand

Item	2020	2025	2030	2035	2040	2045	2050
Electricity distribution capital invested -	0	0.484	0.475	0.654	0.668	1.11	1.17
Cumulative 5-yr (billion \$2018)							

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

Item	2020	2025	2050
Carbon sink potential - Aggressive deployment -	0	0	0
Corn-ethanol to energy grasses (1000 tCO2e/y)			
Carbon sink potential - Aggressive deployment -	0	0	-312
Cropland measures (1000 tCO2e/y)			
Carbon sink potential - Aggressive deployment -	0	0	-10.1
Permanent conservation cover (1000 tCO2e/y)			
Carbon sink potential - Aggressive deployment -	0	0	-322
Total (1000 tC02e/y)			

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

Table 22. E Scenario I IEEAN O. Earla Siliko 7	igi icaitai c (c	ontinacaj	
Item	2020	2025	2050
Carbon sink potential - Moderate deployment -	0	0	0
Corn-ethanol to energy grasses (1000 tCO2e/y)			
Carbon sink potential - Moderate deployment -	0	0	-164
Cropland measures (1000 tCO2e/y)			
Carbon sink potential - Moderate deployment -	0	0	-5.04
Permanent conservation cover (1000 tC02e/y)			
Carbon sink potential - Moderate deployment -	0	0	-169
Total (1000 tC02e/y)			
Land impacted for carbon sink - Aggressive	0	0	0
deployment - Corn-ethanol to energy grasses			
(1000 hectares)			
Land impacted for carbon sink - Aggressive	0	0	173
deployment - Cropland measures (1000			
hectares)			
Land impacted for carbon sink - Aggressive	0	0	18.3
deployment - Permanent conservation cover			
(1000 hectares)			
Land impacted for carbon sink - Aggressive	0	0	191
deployment - Total (1000 hectares)			
Land impacted for carbon sink - Moderate	0	0	0
deployment - Corn-ethanol to energy grasses			
(1000 hectares)			
Land impacted for carbon sink - Moderate	0	0	91.1
deployment - Cropland measures (1000			
hectares)			
Land impacted for carbon sink - Moderate	0	0	9.16
deployment - Permanent conservation cover			
(1000 hectares)			
Land impacted for carbon sink - Moderate	0	0	100
deployment - Total (1000 hectares)			

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

Table 23: E- scenario - PILLAR 6: Lana sinks - Fo	rests		
Item	2020	2025	2050
Carbon sink potential - High - Accelerate	0	0	107
regeneration (1000 tCO2e/y)			
Carbon sink potential - High - All (not counting	0	0	26,905
overlap) (1000 tCO2e/y)			
Carbon sink potential - High - Avoid deforestation	0	0	538
(1000 tC02e/y)			
Carbon sink potential - High - Extend rotation	0	0	10,590
length (1000 tCO2e/y)			
Carbon sink potential - High - Improve	0	0	309
plantations (1000 tC02e/y)			
Carbon sink potential - High - Increase retention	0	0	10,909
of HWP (1000 tC02e/y)			
Carbon sink potential - High - Increase trees	0	0	133
outside forests (1000 tCO2e/y)			
Carbon sink potential - High - Reforest cropland	0	0	401
(1000 tC02e/y)			
Carbon sink potential - High - Reforest pasture	0	0	373
(1000 tC02e/y)		_	
Carbon sink potential - High - Restore	0	0	3,545
productivity (1000 tC02e/y)			
Carbon sink potential - Low - Accelerate	0	0	53.7
regeneration (1000 tC02e/y)		_	
Carbon sink potential - Low - All (not counting	0	0	9,475
overlap) (1000 tCO2e/y)			
Carbon sink potential - Low - Avoid deforestation	0	0	89.7
(1000 tCO2e/y)			
Carbon sink potential - Low - Extend rotation	0	0	4,068
length (1000 tC02e/y)			
Carbon sink potential - Low - Improve	0	0	157
plantations (1000 tC02e/y)			

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

Table 23: E- scenario - PILLAR 6: Land sinks - Fo			2050
Item Carbon sink potential - Low - Increase retention	2020	2025	2050 3,636
of HWP (1000 tCO2e/y)		0	3,030
Carbon sink potential - Low - Increase trees	0	0	46.4
outside forests (1000 tCO2e/y)			
Carbon sink potential - Low - Reforest cropland	0	0	201
(1000 tC02e/y)			
Carbon sink potential - Low - Reforest pasture	0	0	28.2
(1000 tC02e/y)			
Carbon sink potential - Low - Restore	0	0	1,195
productivity (1000 tCO2e/y)			
Carbon sink potential - Mid - Accelerate	0	0	80.5
regeneration (1000 tC02e/y)			10 107
Carbon sink potential - Mid - All (not counting	0	0	18,187
overlap) (1000 tC02e/y)	0	0	01/
Carbon sink potential - Mid - Avoid deforestation (1000 tCO2e/y)	0	0	314
Carbon sink potential - Mid - Extend rotation	0	0	7,329
length (1000 tC02e/y)	0	0	1,329
Carbon sink potential - Mid - Improve plantations	0	0	230
(1000 tC02e/y)		0	200
Carbon sink potential - Mid - Increase retention	0	0	7,273
of HWP (1000 tCO2e/y)			1,210
Carbon sink potential - Mid - Increase trees	0	0	89.4
outside forests (1000 tC02e/y)			• • • • • • • • • • • • • • • • • • • •
Carbon sink potential - Mid - Reforest cropland	0	0	301
(1000 tC02e/y)			
Carbon sink potential - Mid - Reforest pasture	0	0	200
(1000 tC02e/y)			
Carbon sink potential - Mid - Restore	0	0	2,370
productivity (1000 tCO2e/y)			
Land impacted for carbon sink potential - High -	0	0	17.5
Accelerate regeneration (1000 hectares)			
Land impacted for carbon sink potential - High -	0	0	72.9
Avoid deforestation (over 30 years) (1000			
hectares)			F / 00
Land impacted for carbon sink potential - High -	0	0	5,400
Extend rotation length (1000 hectares)	0	0	11/
Land impacted for carbon sink potential - High - Improve plantations (1000 hectares)	0	0	114
Land impacted for carbon sink potential - High -	0	0	0
Increase retention of HWP (1000 hectares)		0	U
Land impacted for carbon sink potential - High -	0	0	12.6
Increase trees outside forests (1000 hectares)		0	12.0
Land impacted for carbon sink potential - High -	0	0	26.5
Reforest cropland (1000 hectares)			
Land impacted for carbon sink potential - High -	0	0	10.6
Reforest pasture (1000 hectares)			
Land impacted for carbon sink potential - High -	0	0	1,175
Restore productivity (1000 hectares)			,
Land impacted for carbon sink potential - High -	0	0	6,829
Total impacted (over 30 years) (1000 hectares)			
Land impacted for carbon sink potential - Low -	0	0	8.77
Accelerate regeneration (1000 hectares)			
Land impacted for carbon sink potential - Low -	0	0	68.4
Avoid deforestation (over 30 years) (1000			
hectares)			
Land impacted for carbon sink potential - Low -	0	0	2,069
Extend rotation length (1000 hectares)			
Land impacted for carbon sink potential - Low -	0	0	56.9
Improve plantations (1000 hectares)			
Land impacted for carbon sink potential - Low -	0	0	0
Increase retention of HWP (1000 hectares)			

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

Item	2020	2025	2050
Land impacted for carbon sink potential - Low -	0	0	6.63
Increase trees outside forests (1000 hectares)			
Land impacted for carbon sink potential - Low -	0	0	13.3
Reforest cropland (1000 hectares)			
Land impacted for carbon sink potential - Low -	0	0	1.84
Reforest pasture (1000 hectares)			
Land impacted for carbon sink potential - Low -	0	0	711
Restore productivity (1000 hectares)			
Land impacted for carbon sink potential - Low -	0	0	2,936
Total impacted (over 30 years) (1000 hectares)			
Land impacted for carbon sink potential - Mid -	0	0	13.2
Accelerate regeneration (1000 hectares)			
Land impacted for carbon sink potential - Mid -	0	0	70.6
Avoid deforestation (over 30 years) (1000			
hectares)			
Land impacted for carbon sink potential - Mid -	0	0	3,734
Extend rotation length (1000 hectares)			
Land impacted for carbon sink potential - Mid -	0	0	85.7
Improve plantations (1000 hectares)			
Land impacted for carbon sink potential - Mid -	0	0	0
Increase retention of HWP (1000 hectares)			
Land impacted for carbon sink potential - Mid -	0	0	9.61
Increase trees outside forests (1000 hectares)			
Land impacted for carbon sink potential - Mid -	0	0	19.9
Reforest cropland (1000 hectares)			
Land impacted for carbon sink potential - Mid -	0	0	13.3
Reforest pasture (1000 hectares)			
Land impacted for carbon sink potential - Mid -	0	0	1,432
Restore productivity (1000 hectares)			
Land impacted for carbon sink potential - Mid -	0	0	5,379
Total impacted (over 30 years) (1000 hectares)			

Table 24: E- scenario - IMPACTS - Health

Item	2020	2025	2030	2035	2040	2045	2050
Monetary damages from air pollution - Coal	0	125	0.148	0.147	0.14	0.083	0.004
(million 2019\$)							
Monetary damages from air pollution - Natural	0	34.2	16.1	6.11	2.58	0.798	0.887
Gas (million 2019\$)							
Monetary damages from air pollution -	0	166	164	156	138	107	71.8
Transportation (million 2019\$)							
Premature deaths from air pollution - Coal	0	14	0.017	0.017	0.016	0.009	0
(deaths)							
Premature deaths from air pollution - Natural	0	3.86	1.81	0.691	0.292	0.09	0.1
Gas (deaths)							
Premature deaths from air pollution -	0	18.7	18.5	17.6	15.5	12.1	8.08
Transportation (deaths)							

 ${\it Table~25: E+RE+scenario-PILLAR~1: Efficiency/Electrification-Residential}$ 

Item	2020	2025	2030	2035	2040	2045	2050
Residential HVAC investment in 2020s vs. REF -	0	1.25	1.28	0	0	0	0
Cumulative 5-yr (billion \$2018)							
Sales of cooking units - Electric Resistance (%)	64.2	71.8	95.2	99.8	100	100	100
Sales of cooking units - Gas (%)	35.8	28.2	4.82	0.243	0	0	0
Sales of space heating units - Electric Heat Pump	3	12.5	61.9	80.8	83.2	83.5	83.4
(%)							
Sales of space heating units - Electric Resistance	1.39	1.41	1.15	0.541	0.387	0.388	0.424
(%)							
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 Heat Pump	0	2.79	18.7	33.9	36.7	36.9	37
[%]							

Table 25: E+RE+ scenario - PILLAR 1: Efficiency/Electrification - Residential (continued)

Item	2020	2025	2030	2035	2040	2045	2050
Sales of water heating units - Electric Resistance	25.5	44.1	55.6	61.8	62.9	63	62.9
(%)							
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 26: E+RE+ scenario - PILLAR 1: Efficiency/Electrification - Transportation

Item	2020	2025	2030	2035	2040	2045	2050
Light-duty vehicle capital costs - Cumulative 5-yr	0	216	554	896	1,358	1,478	1,409
(million \$2018)							
Public EV charging plugs - DC Fast (1000 units)	0.118	0	0.513	0	2.24	0	3.63
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 FC (%)	0.196	1.27	6.33	15.2	19.1	19.9	20
Vehicle sales - Medium-duty - other (%)	0.253	0.255	0.205	0.083	0.019	0.004	0

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 - Commercial

Item	2020	2025	2030	2035	2040	2045	2050
Commercial HVAC investment in 2020s -	0	2,622	2,862	0	0	0	0
Cumulative 5-yr (million \$2018)							
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 29: E+RE+ scenario - PILLAR 1: Efficiency/Electrification - Electricity demand

Item	2020	2025	2030	2035	2040	2045	2050
Electricity distribution capital invested -	0	0.631	0.64	1.22	1.29	1.26	1.32
Cumulative 5-yr (billion \$2018)							

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

	-	_					
Item	2020	2025	2030	2035	2040	2045	2050
Capital invested - Offshore Wind - Base (billion \$2018)	0	0	0	0	0.583	20.6	44.7
Capital invested - Solar PV - Base (billion \$2018)	0	0	0	0.434	0.33	3.49	8.83
Capital invested - Wind - Base (billion \$2018)	0	0	0	0	0	0	0.077

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

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

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

Itom	2020	2025	2050
Item			
Carbon sink potential - Aggressive deployment -	0	0	0
Corn-ethanol to energy grasses (1000 tC02e/y)			010
Carbon sink potential - Aggressive deployment -	0	0	-312
Cropland measures (1000 tC02e/y)			
Carbon sink potential - Aggressive deployment -	0	0	-10.1
Permanent conservation cover (1000 tCO2e/y)			
Carbon sink potential - Aggressive deployment -	0	0	-322
Total (1000 tCO2e/y)			
Carbon sink potential - Moderate deployment -	0	0	0
Corn-ethanol to energy grasses (1000 tC02e/y)			
Carbon sink potential - Moderate deployment -	0	0	-164
Cropland measures (1000 tCO2e/y)			
Carbon sink potential - Moderate deployment -	0	0	-5.04
Permanent conservation cover (1000 tCO2e/y)			
Carbon sink potential - Moderate deployment -	0	0	-169
Total (1000 tC02e/y)			
Land impacted for carbon sink - Aggressive	0	0	0
deployment - Corn-ethanol to energy grasses			
(1000 hectares)			
Land impacted for carbon sink - Aggressive	0	0	173
deployment - Cropland measures (1000			
hectares)			
Land impacted for carbon sink - Aggressive	0	0	18.3
deployment - Permanent conservation cover			
(1000 hectares)			
Land impacted for carbon sink - Aggressive	0	0	191
deployment - Total (1000 hectares)			
Land impacted for carbon sink - Moderate	0	0	0
deployment - Corn-ethanol to energy grasses			
(1000 hectares)			
Land impacted for carbon sink - Moderate	0	0	91.1
deployment - Cropland measures (1000			
hectares)			
Land impacted for carbon sink - Moderate	0	0	9.16
deployment - Permanent conservation cover			
(1000 hectares)			
Land impacted for carbon sink - Moderate	0	0	100
deployment - Total (1000 hectares)		-	

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

Table 33: E+RE+ scenario - PILLAR 6: Land sinks		0005	2050
Item	2020	2025	2050
Carbon sink potential - High - Accelerate	0	0	107
regeneration (1000 tCO2e/y)  Carbon sink potential - High - All (not counting	0	0	26,905
overlap) (1000 tC02e/y)	U	U	20,903
Carbon sink potential - High - Avoid deforestation	0	0	538
(1000 tCO2e/y)	0	0	336
Carbon sink potential - High - Extend rotation	0	0	10,590
length (1000 tC02e/y)	0	0	10,370
Carbon sink potential - High - Improve	0	0	309
plantations (1000 tCO2e/y)	Ŭ	0	007
Carbon sink potential - High - Increase retention	0	0	10,909
of HWP (1000 tCO2e/y)	Ŭ	0	10,707
Carbon sink potential - High - Increase trees	0	0	133
outside forests (1000 tCO2e/y)			.00
Carbon sink potential - High - Reforest cropland	0	0	401
(1000 tC02e/y)			
Carbon sink potential - High - Reforest pasture	0	0	373
(1000 tC02e/y)			
Carbon sink potential - High - Restore	0	0	3,545
productivity (1000 tCO2e/y)			.,.
Carbon sink potential - Low - Accelerate	0	0	53.7
regeneration (1000 tCO2e/y)			
Carbon sink potential - Low - All (not counting	0	0	9,475
overlap) (1000 tC02e/y)			
Carbon sink potential - Low - Avoid deforestation	0	0	89.7
(1000 tC02e/y)			
Carbon sink potential - Low - Extend rotation	0	0	4,068
length (1000 tC02e/y)			
Carbon sink potential - Low - Improve	0	0	157
plantations (1000 tCO2e/y)			
Carbon sink potential - Low - Increase retention	0	0	3,636
of HWP (1000 tCO2e/y)			
Carbon sink potential - Low - Increase trees	0	0	46.4
outside forests (1000 tCO2e/y)			
Carbon sink potential - Low - Reforest cropland	0	0	201
(1000 tC02e/y)			
Carbon sink potential - Low - Reforest pasture	0	0	28.2
(1000 tC02e/y)			
Carbon sink potential - Low - Restore	0	0	1,195
productivity (1000 tCO2e/y)			
Carbon sink potential - Mid - Accelerate	0	0	80.5
regeneration (1000 tCO2e/y)			
Carbon sink potential - Mid - All (not counting	0	0	18,187
overlap) (1000 tCO2e/y)			
Carbon sink potential - Mid - Avoid deforestation	0	0	314
(1000 tCO2e/y)			
Carbon sink potential - Mid - Extend rotation	0	0	7,329
length (1000 tC02e/y)			
Carbon sink potential - Mid - Improve plantations	0	0	230
(1000 tC02e/y)			
Carbon sink potential - Mid - Increase retention	0	0	7,273
of HWP (1000 tCO2e/y)			
Carbon sink potential - Mid - Increase trees	0	0	89.4
outside forests (1000 tC02e/y)			
Carbon sink potential - Mid - Reforest cropland	0	0	301
(1000 tC02e/y)			
Carbon sink potential - Mid - Reforest pasture	0	0	200
(1000 tC02e/y)			
Carbon sink potential - Mid - Restore	0	0	2,370
productivity (1000 tCO2e/y)			
Land impacted for carbon sink potential - High -	0	0	17.5
Accelerate regeneration (1000 hectares)			

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

Table 33: E+RE+ scenario - PILLAR 6: Land sinks	•		
Item	2020	2025	2050
Land impacted for carbon sink potential - High -	0	0	72.9
Avoid deforestation (over 30 years) (1000			
hectares)			
Land impacted for carbon sink potential - High -	0	0	5,400
Extend rotation length (1000 hectares)		-	-,
Land impacted for carbon sink potential - High -	0	0	114
	U	١	114
Improve plantations (1000 hectares)			
Land impacted for carbon sink potential - High -	0	0	0
Increase retention of HWP (1000 hectares)			
Land impacted for carbon sink potential - High -	0	0	12.6
Increase trees outside forests (1000 hectares)			
Land impacted for carbon sink potential - High -	0	0	26.5
Reforest cropland (1000 hectares)			
Land impacted for carbon sink potential - High -	0	0	10.6
	U	١	10.6
Reforest pasture (1000 hectares)			
Land impacted for carbon sink potential - High -	0	0	1,175
Restore productivity (1000 hectares)			
Land impacted for carbon sink potential - High -	0	0	6,829
Total impacted (over 30 years) (1000 hectares)			
Land impacted for carbon sink potential - Low -	0	0	8.77
Accelerate regeneration (1000 hectares)			<b></b>
Land impacted for carbon sink potential - Low -	0	0	68.4
	U	0	66.4
Avoid deforestation (over 30 years) (1000			
hectares)			
Land impacted for carbon sink potential - Low -	0	0	2,069
Extend rotation length (1000 hectares)			
Land impacted for carbon sink potential - Low -	0	0	56.9
Improve plantations (1000 hectares)			00.7
Land impacted for carbon sink potential - Low -	0	0	0
	U	0	U
Increase retention of HWP (1000 hectares)			
Land impacted for carbon sink potential - Low -	0	0	6.63
Increase trees outside forests (1000 hectares)			
Land impacted for carbon sink potential - Low -	0	0	13.3
Reforest cropland (1000 hectares)			
Land impacted for carbon sink potential - Low -	0	0	1.84
Reforest pasture (1000 hectares)	ŭ	•	
Land impacted for carbon sink potential - Low -	0	0	711
	0	U	711
Restore productivity (1000 hectares)			
Land impacted for carbon sink potential - Low -	0	0	2,936
Total impacted (over 30 years) (1000 hectares)			
Land impacted for carbon sink potential - Mid -	0	0	13.2
Accelerate regeneration (1000 hectares)			
Land impacted for carbon sink potential - Mid -	0	0	70.6
	o	١	10.0
Avoid deforestation (over 30 years) (1000			
hectares)			
Land impacted for carbon sink potential - Mid -	0	0	3,734
Extend rotation length (1000 hectares)			
Land impacted for carbon sink potential - Mid -	0	0	85.7
Improve plantations (1000 hectares)			
Land impacted for carbon sink potential - Mid -	0	0	0
	U	١	U
Increase retention of HWP (1000 hectares)			
Land impacted for carbon sink potential - Mid -	0	0	9.61
Increase trees outside forests (1000 hectares)			
Land impacted for carbon sink potential - Mid -	0	0	19.9
Reforest cropland (1000 hectares)			
Land impacted for carbon sink potential - Mid -	0	0	13.3
Reforest pasture (1000 hectares)	ŭ	٦	10.0
Motor Got hastar & (1000 HERIAI ES)			1,432
Land impacted for contanging assertial Add			1437
Land impacted for carbon sink potential - Mid -	0	0	1, 102
Restore productivity (1000 hectares)			
	0	0	5,379

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

Item	2020	2025	2030	2035	2040	2045	2050
Monetary damages from air pollution - Coal	0	125	0.148	0.147	0.14	0.083	0.004
(million 2019\$)							
Monetary damages from air pollution - Natural	0	32.6	17.5	9.62	7.51	2.54	0.915
Gas (million 2019\$)							
Monetary damages from air pollution -	0	163	149	111	62.7	27.6	10.1
Transportation (million 2019\$)							
Premature deaths from air pollution - Coal	0	14	0.017	0.017	0.016	0.009	0
(deaths)							
Premature deaths from air pollution - Natural	0	3.68	1.98	1.09	0.848	0.287	0.103
Gas (deaths)							
Premature deaths from air pollution -	0	18.4	16.8	12.5	7.05	3.11	1.14
Transportation (deaths)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Residential HVAC investment in 2020s vs. REF -	0	1.25	1.28	0	0	0	0
Cumulative 5-yr (billion \$2018)							
Sales of cooking units - Electric Resistance (%)	64.2	71.8	95.2	99.8	100	100	100
Sales of cooking units - Gas (%)	35.8	28.2	4.82	0.243	0	0	0
Sales of space heating units - Electric Heat Pump	3	12.5	61.9	80.8	83.2	83.5	83.4
(%)							
Sales of space heating units - Electric Resistance	1.39	1.41	1.15	0.541	0.387	0.388	0.424
(%)							
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 Heat Pump	0	2.79	18.7	33.9	36.7	36.9	37
(%)							
Sales of water heating units - Electric Resistance	25.5	44.1	55.6	61.8	62.9	63	62.9
(%)							
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 36: E+RE- scenario - PILLAR 1: Efficiency/Electrification - Transportation

Item	2020	2025	2030	2035	2040	2045	2050
Light-duty vehicle capital costs - Cumulative 5-yr	0	216	554	896	1,358	1,478	1,409
(million \$2018)							
Public EV charging plugs - DC Fast (1000 units)	0.118	0	0.513	0	2.24	0	3.63
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 FC (%)	0.196	1.27	6.33	15.2	19.1	19.9	20
Vehicle sales - Medium-duty - other (%)	0.253	0.255	0.205	0.083	0.019	0.004	0

#### 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
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 - Commercial

Item	2020	2025	2030	2035	2040	2045	2050
Commercial HVAC investment in 2020s -	0	2,622	2,862	0	0	0	0
Cumulative 5-yr (million \$2018)							
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 39: E+RE- scenario - PILLAR 1: Efficiency/Electrification - Electricity demand

Item	2020	2025	2030	2035	2040	2045	2050
Electricity distribution capital invested -	0	0.631	0.64	1.22	1.29	1.26	1.32
Cumulative 5-yr (billion \$2018)							

#### 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	0
Capital invested - Solar PV - Constrained (billion \$2018)	0	0	0	0	0	0	0
Capital invested - Wind - Base (billion \$2018)	0	0	0	0	0	0	0
Capital invested - Wind - Constrained (billion \$2018)	0	0	0	0	0	0	0

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

	-	
Item	2020	2025
Solar - Base land use assumptions (GWh)	176	0
Solar - Constrained land use assumptions (GWh)	176	0
Wind - Base land use assumptions (GWh)	4,130	0
Wind - Constrained land use assumptions (GWh)	4,130	0

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

Item	2020	2025	2050
Carbon sink potential - Aggressive deployment -	0	0	0
Corn-ethanol to energy grasses (1000 tCO2e/y)			
Carbon sink potential - Aggressive deployment -	0	0	-312
Cropland measures (1000 tCO2e/y)			
Carbon sink potential - Aggressive deployment -	0	0	-10.1
Permanent conservation cover (1000 tCO2e/y)			
Carbon sink potential - Aggressive deployment -	0	0	-322
Total (1000 tC02e/y)			
Carbon sink potential - Moderate deployment -	0	0	0
Corn-ethanol to energy grasses (1000 tCO2e/y)			

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

Item	2020	2025	2050
Carbon sink potential - Moderate deployment -	0	0	-164
Cropland measures (1000 tC02e/y)			5.07
Carbon sink potential - Moderate deployment -	0	0	-5.04
Permanent conservation cover (1000 tC02e/y)		_	
Carbon sink potential - Moderate deployment -	0	0	-169
Total (1000 tC02e/y)			
Land impacted for carbon sink - Aggressive	0	0	0
deployment - Corn-ethanol to energy grasses			
(1000 hectares)			
Land impacted for carbon sink - Aggressive	0	0	173
deployment - Cropland measures (1000			
hectares)			
Land impacted for carbon sink - Aggressive	0	0	18.3
deployment - Permanent conservation cover			
(1000 hectares)			
Land impacted for carbon sink - Aggressive	0	0	191
deployment - Total (1000 hectares)			
Land impacted for carbon sink - Moderate	0	0	0
deployment - Corn-ethanol to energy grasses			_
(1000 hectares)			
Land impacted for carbon sink - Moderate	0	0	91.1
deployment - Cropland measures (1000			
hectares)			
Land impacted for carbon sink - Moderate	0	0	9.16
deployment - Permanent conservation cover			
(1000 hectares)			
Land impacted for carbon sink - Moderate	0	0	100
deployment - Total (1000 hectares)			
adployment Total (1000 Hodda ob)			

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

Thom	2020	2025	2050
Item			
Carbon sink potential - High - Accelerate	0	0	107
regeneration (1000 tC02e/y)			
Carbon sink potential - High - All (not counting	0	0	26,905
overlap) (1000 tCO2e/y)			
Carbon sink potential - High - Avoid deforestation	0	0	538
(1000 tC02e/y)			
Carbon sink potential - High - Extend rotation	0	0	10,590
length (1000 tCO2e/y)			
Carbon sink potential - High - Improve	0	0	309
plantations (1000 tCO2e/y)			
Carbon sink potential - High - Increase retention	0	0	10,909
of HWP (1000 tCO2e/y)			
Carbon sink potential - High - Increase trees	0	0	133
outside forests (1000 tCO2e/y)			
Carbon sink potential - High - Reforest cropland	0	0	401
(1000 tCO2e/y)			
Carbon sink potential - High - Reforest pasture	0	0	373
(1000 tC02e/y)			
Carbon sink potential - High - Restore	0	0	3,545
productivity (1000 tCO2e/y)			
Carbon sink potential - Low - Accelerate	0	0	53.7
regeneration (1000 tCO2e/y)			
Carbon sink potential - Low - All (not counting	0	0	9,475
overlap) (1000 tCO2e/y)			.,
Carbon sink potential - Low - Avoid deforestation	0	0	89.7
(1000 tC02e/y)			<b>3</b> 7
Carbon sink potential - Low - Extend rotation	0	0	4,068
length (1000 tC02e/y)			1,000
Carbon sink potential - Low - Improve	0	0	157
plantations (1000 tCO2e/y)		0	101
Carbon sink potential - Low - Increase retention	0	0	3,636
of HWP (1000 tCO2e/y)		0	3,030
01 11001 (1000 (0026/9)			

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

Table 43: E+RE- scenario - PILLAR 6: Land sinks	- Forests (co	intinued)	
Item	2020	2025	2050
Carbon sink potential - Low - Increase trees	0	0	46.4
outside forests (1000 tCO2e/y)			
Carbon sink potential - Low - Reforest cropland	0	0	201
(1000 tC02e/y)			
Carbon sink potential - Low - Reforest pasture	0	0	28.2
(1000 tC02e/y)			
Carbon sink potential - Low - Restore	0	0	1,195
productivity (1000 tCO2e/y)	0	0	1,170
Carbon sink potential - Mid - Accelerate	0	0	80.5
	U	0	60.5
regeneration (1000 tC02e/y)	0	0	10 107
Carbon sink potential - Mid - All (not counting	0	0	18,187
overlap) (1000 tC02e/y)			047
Carbon sink potential - Mid - Avoid deforestation	0	0	314
(1000 tC02e/y)	_		
Carbon sink potential - Mid - Extend rotation	0	0	7,329
length (1000 tCO2e/y)			
Carbon sink potential - Mid - Improve plantations	0	0	230
(1000 tC02e/y)			
Carbon sink potential - Mid - Increase retention	0	0	7,273
of HWP (1000 tCO2e/y)			
Carbon sink potential - Mid - Increase trees	0	0	89.4
outside forests (1000 tCO2e/y)			
Carbon sink potential - Mid - Reforest cropland	0	0	301
(1000 tC02e/y)			-
Carbon sink potential - Mid - Reforest pasture	0	0	200
(1000 tC02e/y)		Ŭ	200
Carbon sink potential - Mid - Restore	0	0	2,370
productivity (1000 tCO2e/y)	0	0	2,310
Land impacted for carbon sink potential - High -	0	0	17.5
	U	U	17.5
Accelerate regeneration (1000 hectares)	0	0	70.0
Land impacted for carbon sink potential - High -	0	0	72.9
Avoid deforestation (over 30 years) (1000			
hectares)			
Land impacted for carbon sink potential - High -	0	0	5,400
Extend rotation length (1000 hectares)			
Land impacted for carbon sink potential - High -	0	0	114
Improve plantations (1000 hectares)			
Land impacted for carbon sink potential - High -	0	0	0
Increase retention of HWP (1000 hectares)			
Land impacted for carbon sink potential - High -	0	0	12.6
Increase trees outside forests (1000 hectares)			
Land impacted for carbon sink potential - High -	0	0	26.5
Reforest cropland (1000 hectares)			
Land impacted for carbon sink potential - High -	0	0	10.6
Reforest pasture (1000 hectares)			10.0
Land impacted for carbon sink potential - High -	0	0	1,175
Restore productivity (1000 hectares)	0	0	1,110
Land impacted for carbon sink potential - High -	0	0	6,829
	U	0	0,029
Total impacted (over 30 years) (1000 hectares)	0	0	0.77
Land impacted for carbon sink potential - Low -	0	0	8.77
Accelerate regeneration (1000 hectares)			
Land impacted for carbon sink potential - Low -	0	0	68.4
Avoid deforestation (over 30 years) (1000			
hectares)			
Land impacted for carbon sink potential - Low -	0	0	2,069
Extend rotation length (1000 hectares)	0	0	56.9
Extend rotation length (1000 hectares)  Land impacted for carbon sink potential - Low -	0		
	U		
Land impacted for carbon sink potential - Low - Improve plantations (1000 hectares)	0	0	0
Land impacted for carbon sink potential - Low - Improve plantations (1000 hectares) Land impacted for carbon sink potential - Low -		0	0
Land impacted for carbon sink potential - Low - Improve plantations (1000 hectares)		0	6.63

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

	7 07 0010 (01		
Item	2020	2025	2050
Land impacted for carbon sink potential - Low -	0	0	13.3
Reforest cropland (1000 hectares)			
Land impacted for carbon sink potential - Low -	0	0	1.84
Reforest pasture (1000 hectares)			
Land impacted for carbon sink potential - Low -	0	0	711
Restore productivity (1000 hectares)			
Land impacted for carbon sink potential - Low -	0	0	2,936
Total impacted (over 30 years) (1000 hectares)			
Land impacted for carbon sink potential - Mid -	0	0	13.2
Accelerate regeneration (1000 hectares)			
Land impacted for carbon sink potential - Mid -	0	0	70.6
Avoid deforestation (over 30 years) (1000			
hectares)			
Land impacted for carbon sink potential - Mid -	0	0	3,734
Extend rotation length (1000 hectares)			
Land impacted for carbon sink potential - Mid -	0	0	85.7
Improve plantations (1000 hectares)			
Land impacted for carbon sink potential - Mid -	0	0	0
Increase retention of HWP (1000 hectares)			
Land impacted for carbon sink potential - Mid -	0	0	9.61
Increase trees outside forests (1000 hectares)			
Land impacted for carbon sink potential - Mid -	0	0	19.9
Reforest cropland (1000 hectares)			
Land impacted for carbon sink potential - Mid -	0	0	13.3
Reforest pasture (1000 hectares)			
Land impacted for carbon sink potential - Mid -	0	0	1,432
Restore productivity (1000 hectares)			
Land impacted for carbon sink potential - Mid -	0	0	5,379
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	0	125	0.148	0.147	0.14	0.083	0.004
(million 2019\$)							
Monetary damages from air pollution - Natural	0	34.7	19.4	21	15.7	7.44	1.74
Gas (million 2019\$)							
Monetary damages from air pollution -	0	163	149	111	62.7	27.6	10.1
Transportation (million 2019\$)							
Premature deaths from air pollution - Coal	0	14	0.017	0.017	0.016	0.009	0
(deaths)							
Premature deaths from air pollution - Natural	0	3.92	2.19	2.37	1.77	0.84	0.197
Gas (deaths)							
Premature deaths from air pollution -	0	18.4	16.8	12.5	7.05	3.11	1.14
Transportation (deaths)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Residential HVAC investment in 2020s vs. REF -	0	1.25	1.38	0	0	0	0
Cumulative 5-yr (billion \$2018)							
Sales of cooking units - Electric Resistance (%)	64.1	65	68.3	77	89	96.5	99
Sales of cooking units - Gas (%)	35.9	35	31.7	23	11	3.54	0.953
Sales of space heating units - Electric Heat Pump	3	2.62	5.43	13.6	26.9	36.8	40.8
(%)							
Sales of space heating units - Electric Resistance	1.39	1.43	1.43	1.44	1.28	1.11	1.03
(%)							
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 Heat Pump	0	0.324	1.24	4.01	9.3	14.5	17.2
(%)							
Sales of water heating units - Electric Resistance	25.5	41.9	42.4	44.6	47.8	50.5	51.8
(%)							

#### Table 45: E-B+ scenario - PILLAR 1: Efficiency/Electrification - Residential (continued)

Item	2020	2025	2030	2035	2040	2045	2050
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 46: E-B+ scenario - PILLAR 1: Efficiency/Electrification - Transportation

Item	2020	2025	2030	2035	2040	2045	2050
Light-duty vehicle capital costs - Cumulative 5-yr (million \$2018)	0	0	35	73.4	248	780	1,136
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
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 FC (%)	0.166	0.485	1.37	3.58	7.86	13.2	17
Vehicle sales - Medium-duty - other (%)	0.253	0.266	0.279	0.286	0.258	0.184	0.102

#### 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 - Commercial

2020	2025	2030	2035	2040	2045	2050
0	2,622	2,866	0	0	0	0
36.9	40.7	44.7	56.5	72.7	82.9	86.4
63.1	59.3	55.3	43.5	27.3	17.1	13.6
2.33	6.89	8.48	13.3	22.8	32.7	38.1
1.31	1.76	2.43	4.48	7.93	10.5	11.3
84.1	39.2	38.1	33.9	26.8	22.3	21
12.2	52.1	51	48.4	42.5	34.6	29.5
4.05	2.68	3.38	5.63	11.1	17.9	22
19.4	11.6	11.9	14.5	19.6	26	29.9
58.2	79.9	79.4	75.1	65.2	52.6	44.8
18.4	5.77	5.34	4.75	4.17	3.55	3.28
	36.9 63.1 2.33 1.31 84.1 12.2 4.05	0 2,622  36.9 40.7 63.1 59.3 2.33 6.89  1.31 1.76  84.1 39.2 12.2 52.1 4.05 2.68  19.4 11.6  58.2 79.9	0     2,622     2,866       36.9     40.7     44.7       63.1     59.3     55.3       2.33     6.89     8.48       1.31     1.76     2.43       84.1     39.2     38.1       12.2     52.1     51       4.05     2.68     3.38       19.4     11.6     11.9       58.2     79.9     79.4	0     2,622     2,866     0       36.9     40.7     44.7     56.5       63.1     59.3     55.3     43.5       2.33     6.89     8.48     13.3       1.31     1.76     2.43     4.48       84.1     39.2     38.1     33.9       12.2     52.1     51     48.4       4.05     2.68     3.38     5.63       19.4     11.6     11.9     14.5       58.2     79.9     79.4     75.1	0       2,622       2,866       0       0         36.9       40.7       44.7       56.5       72.7         63.1       59.3       55.3       43.5       27.3         2.33       6.89       8.48       13.3       22.8         1.31       1.76       2.43       4.48       7.93         84.1       39.2       38.1       33.9       26.8         12.2       52.1       51       48.4       42.5         4.05       2.68       3.38       5.63       11.1         19.4       11.6       11.9       14.5       19.6         58.2       79.9       79.4       75.1       65.2	0       2,622       2,866       0       0       0         36.9       40.7       44.7       56.5       72.7       82.9         63.1       59.3       55.3       43.5       27.3       17.1         2.33       6.89       8.48       13.3       22.8       32.7         1.31       1.76       2.43       4.48       7.93       10.5         84.1       39.2       38.1       33.9       26.8       22.3         12.2       52.1       51       48.4       42.5       34.6         4.05       2.68       3.38       5.63       11.1       17.9         19.4       11.6       11.9       14.5       19.6       26         58.2       79.9       79.4       75.1       65.2       52.6

#### Table 49: E-B+ scenario - PILLAR 1: Efficiency/Electrification - Electricity demand

	•		,				
Item	2020	2025	2030	2035	2040	2045	2050
Electricity distribution capital invested -	0	0.484	0.475	0.654	0.668	1.11	1.17
Cumulative 5-yr (billion \$2018)							

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

•	0,						
Item	2020	2025	2030	2035	2040	2045	2050
Biomass purchases (million \$2018/year)	0	0.052	136	136	136	136	457
Conversion capital investment - Cumulative 5-yr	0	0.047	1,023	0	0	0	3,664
(million \$2018)							
Number of facilities - Allam power w ccu	0	0	0	0	0	0	1
(quantity)							
Number of facilities - Beccs hydrogen (quantity)	0	0	0	0	0	0	4
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 (quantity)	0	0	0	0	0	0	1
Number of facilities - Pyrolysis (quantity)	0	0	0	0	0	0	0
Number of facilities - Pyrolysis ccu (quantity)	0	0	0	0	0	0	1
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	0	3.32	3.42	8.05
Annual - BECCS (MMT)	0	0	0	0	0	0	4.52
Annual - Cement and lime (MMT)	0	0	0	0	3.32	3.42	3.53
Annual - NGCC (MMT)	0	0	0	0	0	0	0
Cumulative - All (MMT)	0	0	0	0	3.32	6.74	14.8
Cumulative - BECCS (MMT)	0	0	0	0	0	0	4.52
Cumulative - Cement and lime (MMT)	0	0	0	0	3.32	6.74	10.3
Cumulative - NGCC (MMT)	0	0	0	0	0	0	0

#### Table 54: 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	0
Injection wells (wells)	0	0	0	0	0	0	0
Resource characterization, appraisal, permitting costs (million \$2020)	0	0	0	0	0	0	0
Wells and facilities construction costs (million \$2020)	0	0	0	0	0	0	0

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

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

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

Table 56: E-B+ scenario - PILLAR 6: Land sinks	- Agriculture		
Item	2020	2025	2050
Carbon sink potential - Aggressive deployment -	0	0	0
Corn-ethanol to energy grasses (1000 tCO2e/y)			
Carbon sink potential - Aggressive deployment -	0	0	-312
Cropland measures (1000 tCO2e/y)			
Carbon sink potential - Aggressive deployment -	0	0	0
Cropland to woody energy crops (1000 tCO2e/y)			
Carbon sink potential - Aggressive deployment -	0	0	0
Pasture to energy crops (1000 tC02e/y)			
Carbon sink potential - Aggressive deployment -	0	0	-10.1
Permanent conservation cover (1000 tC02e/y)			
Carbon sink potential - Aggressive deployment -	0	0	-322
Total (1000 tC02e/y)			
Carbon sink potential - Moderate deployment -	0	0	0
Corn-ethanol to energy grasses (1000 tC02e/y)			
Carbon sink potential - Moderate deployment -	0	0	-164
Cropland measures (1000 tCO2e/y)			
Carbon sink potential - Moderate deployment -	0	0	0
Cropland to woody energy crops (1000 tCO2e/y)			
Carbon sink potential - Moderate deployment -	0	0	0
Pasture to energy crops (1000 tCO2e/y)			
Carbon sink potential - Moderate deployment -	0	0	-5.04
Permanent conservation cover (1000 tC02e/y)			110
Carbon sink potential - Moderate deployment -	0	0	-169
Total (1000 tC02e/y)			
Land impacted for carbon sink - Aggressive	0	0	0
deployment - Corn-ethanol to energy grasses			
(1000 hectares)		0	
Land impacted for carbon sink - Aggressive	0	0	427
deployment - Cropland measures (1000			
hectares)		0	0
Land impacted for carbon sink - Aggressive	0	0	0
deployment - Cropland to woody energy crops			
(1000 hectares)	0	0	0.741
Land impacted for carbon sink - Aggressive	"	U	0.741
deployment - Pasture to energy crops (1000 hectares)			
Land impacted for carbon sink - Aggressive	0	0	18.3
deployment - Permanent conservation cover		U	10.5
(1000 hectares)			
Land impacted for carbon sink - Aggressive	0	0	446
deployment - Total (1000 hectares)		U	440
Land impacted for carbon sink - Moderate	0	0	0
deployment - Corn-ethanol to energy grasses		U	0
(1000 hectares)			
Land impacted for carbon sink - Moderate	0	0	91.1
deployment - Cropland measures (1000		0	21.1
hectares)			
Land impacted for carbon sink - Moderate	0	0	0
deployment - Cropland to woody energy crops		0	0
(1000 hectares)			
Land impacted for carbon sink - Moderate	0	0	0.742
deployment - Pasture to energy crops (1000		U	0.142
hectares)			
Land impacted for carbon sink - Moderate	0	0	9.16
deployment - Permanent conservation cover		U	7.10
(1000 hectares)			
Land impacted for carbon sink - Moderate	0	0	101
deployment - Total (1000 hectares)		U	101
acpicyment - rotal (1000 neotal 88)			

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

Table 57: E-B+ scenario - PILLAR 6: Land sinks -	- Forests		
Item	2020	2025	2050
Carbon sink potential - High - Accelerate	0	0	107
regeneration (1000 tCO2e/y)			
Carbon sink potential - High - All (not counting	0	0	26,905
overlap) (1000 tC02e/y)			
Carbon sink potential - High - Avoid deforestation	0	0	538
(1000 tCO2e/y)  Carbon sink potential - High - Extend rotation	0	0	10,590
length (1000 tCO2e/y)	0	U	10,590
Carbon sink potential - High - Improve	0	0	309
plantations (1000 tCO2e/y)		0	307
Carbon sink potential - High - Increase retention	0	0	10,909
of HWP (1000 tC02e/y)		,	,
Carbon sink potential - High - Increase trees	0	0	133
outside forests (1000 tCO2e/y)			
Carbon sink potential - High - Reforest cropland	0	0	401
(1000 tCO2e/y)			
Carbon sink potential - High - Reforest pasture	0	0	373
(1000 tC02e/y)			
Carbon sink potential - High - Restore	0	0	3,545
productivity (1000 tC02e/y)			F0 =
Carbon sink potential - Low - Accelerate	0	0	53.7
regeneration (1000 tCO2e/y)  Carbon sink potential - Low - All (not counting	0	0	9,475
overlap) (1000 tCO2e/y)		U	9,413
Carbon sink potential - Low - Avoid deforestation	0	0	89.7
(1000 tC02e/y)			07.1
Carbon sink potential - Low - Extend rotation	0	0	4,068
length (1000 tC02e/y)			,
Carbon sink potential - Low - Improve	0	0	157
plantations (1000 tCO2e/y)			
Carbon sink potential - Low - Increase retention	0	0	3,636
of HWP (1000 tCO2e/y)			
Carbon sink potential - Low - Increase trees	0	0	46.4
outside forests (1000 tC02e/y)			001
Carbon sink potential - Low - Reforest cropland	0	0	201
(1000 tCO2e/y)  Carbon sink potential - Low - Reforest pasture	0	0	28.2
(1000 tCO2e/y)		U	20.2
Carbon sink potential - Low - Restore	0	0	1,195
productivity (1000 tC02e/y)			1,170
Carbon sink potential - Mid - Accelerate	0	0	80.5
regeneration (1000 tCO2e/y)		-	
Carbon sink potential - Mid - All (not counting	0	0	18,187
overlap) (1000 tC02e/y)			
Carbon sink potential - Mid - Avoid deforestation	0	0	314
(1000 tC02e/y)			
Carbon sink potential - Mid - Extend rotation	0	0	7,329
length (1000 tC02e/y)			
Carbon sink potential - Mid - Improve plantations	0	0	230
(1000 tC02e/y)			7.070
Carbon sink potential - Mid - Increase retention of HWP (1000 tCO2e/y)	0	0	7,273
Carbon sink potential - Mid - Increase trees	0	0	89.4
outside forests (1000 tCO2e/y)	"	U	07.4
Carbon sink potential - Mid - Reforest cropland	0	0	301
(1000 tC02e/y)		0	301
Carbon sink potential - Mid - Reforest pasture	0	0	200
(1000 tCO2e/y)		١	200
Carbon sink potential - Mid - Restore	0	0	2,370
productivity (1000 tCO2e/y)		•	_,5.0
	+	0	17.5
Land impacted for carbon sink potential - High -	0	U	11.5

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

Table 57: E-B+ scenario - PILLAR 6: Land sinks	- Forests (con	tinued)	
Item	2020	2025	2050
Land impacted for carbon sink potential - High -	0	0	72.9
Avoid deforestation (over 30 years) (1000			
hectares)			
Land impacted for carbon sink potential - High -	0	0	5,400
Extend rotation length (1000 hectares)			
Land impacted for carbon sink potential - High -	0	0	114
Improve plantations (1000 hectares)			
Land impacted for carbon sink potential - High -	0	0	0
Increase retention of HWP (1000 hectares)		0	U
Land impacted for carbon sink potential - High -	0	0	12.6
Increase trees outside forests (1000 hectares)	0	0	12.0
	0	0	0/ 5
Land impacted for carbon sink potential - High -	0	0	26.5
Reforest cropland (1000 hectares)		-	10 (
Land impacted for carbon sink potential - High -	0	0	10.6
Reforest pasture (1000 hectares)		_	
Land impacted for carbon sink potential - High -	0	0	1,175
Restore productivity (1000 hectares)			
Land impacted for carbon sink potential - High -	0	0	6,829
Total impacted (over 30 years) (1000 hectares)			
Land impacted for carbon sink potential - Low -	0	0	8.77
Accelerate regeneration (1000 hectares)			
Land impacted for carbon sink potential - Low -	0	0	68.4
Avoid deforestation (over 30 years) (1000			
hectares)			
Land impacted for carbon sink potential - Low -	0	0	2,069
Extend rotation length (1000 hectares)			_, -,
Land impacted for carbon sink potential - Low -	0	0	56.9
Improve plantations (1000 hectares)		0	30.7
Land impacted for carbon sink potential - Low -	0	0	0
	0	0	U
Increase retention of HWP (1000 hectares)	0	0	/ / 0
Land impacted for carbon sink potential - Low -	0	0	6.63
Increase trees outside forests (1000 hectares)			
Land impacted for carbon sink potential - Low -	0	0	13.3
Reforest cropland (1000 hectares)			
Land impacted for carbon sink potential - Low -	0	0	1.84
Reforest pasture (1000 hectares)			
Land impacted for carbon sink potential - Low -	0	0	711
Restore productivity (1000 hectares)			
Land impacted for carbon sink potential - Low -	0	0	2,936
Total impacted (over 30 years) (1000 hectares)			
Land impacted for carbon sink potential - Mid -	0	0	13.2
Accelerate regeneration (1000 hectares)			
Land impacted for carbon sink potential - Mid -	0	0	70.6
Avoid deforestation (over 30 years) (1000		0	10.0
hectares)			
Land impacted for carbon sink potential - Mid -	0	0	3,734
	0	U	3,734
Extend rotation length (1000 hectares)			
Land impacted for carbon sink potential - Mid -	0	0	85.7
Improve plantations (1000 hectares)			
Land impacted for carbon sink potential - Mid -	0	0	0
Increase retention of HWP (1000 hectares)			
Land impacted for carbon sink potential - Mid -	0	0	9.61
Increase trees outside forests (1000 hectares)			
Land impacted for carbon sink potential - Mid -	0	0	19.9
Reforest cropland (1000 hectares)			
Land impacted for carbon sink potential - Mid -	0	0	13.3
Reforest pasture (1000 hectares)		-	.5.5
Land impacted for carbon sink potential - Mid -	0	0	1,432
Restore productivity (1000 hectares)		0	1,402
Land impacted for carbon sink potential - Mid -	0	0	5,379
		0	0,017
Total impacted (over 30 years) (1000 hectares)			

Table CO DCC assessia	DILLADA EEC-!	/F1 4 - 161 41	Desidential
Table 58: REF scenario -	PILLAR I: Efficiency	/Electrification -	Kesiaentiai

Item	2020	2025	2030	2035	2040	2045	2050
Residential HVAC investment in 2020s vs. REF -	0	1.23	1.26	0	0	0	0
Cumulative 5-yr (billion \$2018)							
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 59: 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 FC (%)	0.175	0.208	0.242	0.285	0.339	0.409	0.487
Vehicle sales - Medium-duty - other (%)	0.255	0.271	0.298	0.345	0.42	0.528	0.671

# Table 60: 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 61: REF scenario - PILLAR 1: Efficiency/Electrification - Commercial

Item	2020	2025	2030	2035	2040	2045	2050
Commercial HVAC investment in 2020s -	0	2,590	2,664	0	0	0	0
Cumulative 5-yr (million \$2018)							
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
(%)							

Table 61: REF scenario - PILLAR 1: Efficiency/Electrification - Commercial (continued)

Item	2020	2025	2030	2035	2040	2045	2050
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 62: REF scenario - PILLAR 1: Efficiency/Electrification - Electricity demand

Item	2020	2025	2030	2035	2040	2045	2050
Electricity distribution capital invested -	0	0.574	0.576	0.751	0.773	0.756	0.774
Cumulative 5-yr (billion \$2018)							

Table 63: REF scenario - PILLAR 6: Land sinks - Forests

Table 63: REF scenario - PILLAR 6: Land sinks - F				
Item	2020	2025	2030	2050
Business-as-usual carbon sink - Natural uptake (Mt CO2e/y)	-6.38	0	-15.3	-13.7
Business-as-usual carbon sink - Retained in Hardwood Products (Mt CO2e/y)	-2.97	0	-5.34	-5.55
Business-as-usual carbon sink - Total (Mt CO2e/y)	-9.35	0	-20.6	-19.2
Carbon sink potential - High - Accelerate	0	0	0	107
regeneration (1000 tCO2e/y)	0	0	0	-
Carbon sink potential - High - All (not counting overlap) (1000 tCO2e/y)	0	0	0	26,905
Carbon sink potential - High - Avoid deforestation (1000 tCO2e/y)	0	0	0	538
Carbon sink potential - High - Extend rotation length (1000 tC02e/y)	0	0	0	10,590
Carbon sink potential - High - Improve plantations (1000 tC02e/y)	0	0	0	309
Carbon sink potential - High - Increase retention of HWP (1000 tCO2e/y)	0	0	0	10,909
Carbon sink potential - High - Increase trees outside forests (1000 tCO2e/y)	0	0	0	133
Carbon sink potential - High - Reforest cropland (1000 tCO2e/y)	0	0	0	401
Carbon sink potential - High - Reforest pasture (1000 tC02e/y)	0	0	0	373
Carbon sink potential - High - Restore productivity (1000 tC02e/y)	0	0	0	3,545
Carbon sink potential - Low - Accelerate regeneration (1000 tCO2e/y)	0	0	0	53.7
Carbon sink potential - Low - All (not counting overlap) (1000 tCO2e/y)	0	0	0	9,475
Carbon sink potential - Low - Avoid deforestation (1000 tC02e/y)	0	0	0	89.7
Carbon sink potential - Low - Extend rotation length (1000 tCO2e/y)	0	0	0	4,068
Carbon sink potential - Low - Improve plantations (1000 tC02e/y)	0	0	0	157
Carbon sink potential - Low - Increase retention of HWP (1000 tCO2e/y)	0	0	0	3,636
Carbon sink potential - Low - Increase trees outside forests (1000 tCO2e/y)	0	0	0	46.4
Carbon sink potential - Low - Reforest cropland (1000 tCO2e/y)	0	0	0	201
Carbon sink potential - Low - Reforest pasture (1000 tCO2e/y)	0	0	0	28.2
Carbon sink potential - Low - Restore productivity (1000 tCO2e/y)	0	0	0	1,195
Carbon sink potential - Mid - Accelerate regeneration (1000 tCO2e/y)	0	0	0	80.5
Carbon sink potential - Mid - All (not counting overlap) (1000 tC02e/y)	0	0	0	18,187

Table 63: REF scenario - PILLAR 6: Land sinks - Forests (continued)

Table 63: REF scenario - PILLAR 6: Land sinks - I	•	ntınuedJ		
Item	2020	2025	2030	2050
Carbon sink potential - Mid - Avoid deforestation	0	0	0	314
(1000 tC02e/y)				
Carbon sink potential - Mid - Extend rotation	0	0	0	7,329
length (1000 tCO2e/y)				
Carbon sink potential - Mid - Improve plantations	0	0	0	230
(1000 tCO2e/y)				
Carbon sink potential - Mid - Increase retention	0	0	0	7,273
of HWP (1000 tCO2e/y)				
Carbon sink potential - Mid - Increase trees	0	0	0	89.4
outside forests (1000 tCO2e/y)				
Carbon sink potential - Mid - Reforest cropland	0	0	0	301
(1000 tCO2e/y)		0		301
Carbon sink potential - Mid - Reforest pasture	0	0	0	200
		U		200
(1000 tC02e/y)	0	0		0.070
Carbon sink potential - Mid - Restore	0	0	0	2,370
productivity (1000 tC02e/y)			_	
Land impacted for carbon sink potential - High -	0	0	0	17.5
Accelerate regeneration (1000 hectares)				
Land impacted for carbon sink potential - High -	0	0	0	72.9
Avoid deforestation (over 30 years) (1000				
hectares)				
Land impacted for carbon sink potential - High -	0	0	0	5,400
Extend rotation length (1000 hectares)				
Land impacted for carbon sink potential - High -	0	0	0	114
Improve plantations (1000 hectares)		Ü		
Land impacted for carbon sink potential - High -	0	0	0	0
		U		
Increase retention of HWP (1000 hectares)	0			10 (
Land impacted for carbon sink potential - High -	0	0	0	12.6
Increase trees outside forests (1000 hectares)				
Land impacted for carbon sink potential - High -	0	0	0	26.5
Reforest cropland (1000 hectares)				
Land impacted for carbon sink potential - High -	0	0	0	10.6
Reforest pasture (1000 hectares)				
Land impacted for carbon sink potential - High -	0	0	0	1,175
Restore productivity (1000 hectares)				
Land impacted for carbon sink potential - High -	0	0	0	6,829
Total impacted (over 30 years) (1000 hectares)				,
Land impacted for carbon sink potential - Low -	0	0	0	8.77
Accelerate regeneration (1000 hectares)		J		0.11
Land impacted for carbon sink potential - Low -	0	0	0	68.4
		U		00.4
Avoid deforestation (over 30 years) (1000				
hectares)				0.070
Land impacted for carbon sink potential - Low -	0	0	0	2,069
Extend rotation length (1000 hectares)				
Land impacted for carbon sink potential - Low -	0	0	0	56.9
Improve plantations (1000 hectares)				
Land impacted for carbon sink potential - Low -	0	0	0	0
Increase retention of HWP (1000 hectares)				
Land impacted for carbon sink potential - Low -	0	0	0	6.63
Increase trees outside forests (1000 hectares)				
Land impacted for carbon sink potential - Low -	0	0	0	13.3
Reforest cropland (1000 hectares)		Ü		10.0
Land impacted for carbon sink potential - Low -	0	0	0	1.84
	0	U	"	1.04
Reforest pasture (1000 hectares)				744
Land impacted for carbon sink potential - Low -	0	0	0	711
Restore productivity (1000 hectares)				_
Land impacted for carbon sink potential - Low -	0	0	0	2,936
Total impacted (over 30 years) (1000 hectares)				
Land impacted for carbon sink potential - Mid -	0	0	0	13.2
Accelerate regeneration (1000 hectares)				
Land impacted for carbon sink potential - Mid -	0	0	0	70.6
Avoid deforestation (over 30 years) (1000			]	
hectares)				
	1			

Table 63: REF scenario - PILLAR 6: Land sinks - Forests (continued)

Item	2020	2025	2030	2050
Land impacted for carbon sink potential - Mid -	0	0	0	3,734
Extend rotation length (1000 hectares)				
Land impacted for carbon sink potential - Mid -	0	0	0	85.7
Improve plantations (1000 hectares)				
Land impacted for carbon sink potential - Mid -	0	0	0	0
Increase retention of HWP (1000 hectares)				
Land impacted for carbon sink potential - Mid -	0	0	0	9.61
Increase trees outside forests (1000 hectares)				
Land impacted for carbon sink potential - Mid -	0	0	0	19.9
Reforest cropland (1000 hectares)				
Land impacted for carbon sink potential - Mid -	0	0	0	13.3
Reforest pasture (1000 hectares)				
Land impacted for carbon sink potential - Mid -	0	0	0	1,432
Restore productivity (1000 hectares)				
Land impacted for carbon sink potential - Mid -	0	0	0	5,379
Total impacted (over 30 years) (1000 hectares)				

# Table 64: REF scenario - IMPACTS - Health

Item	2020	2025	2030	2035	2040	2045	2050
Monetary damages from air pollution - Coal (million 2019\$)	0	352	221	204	200	196	170
Monetary damages from air pollution - Natural Gas (million 2019\$)	0	26.8	21.7	27	27.6	25.4	23.6
Monetary damages from air pollution - Transportation (million 2019\$)	0	166	166	167	167	168	168
Premature deaths from air pollution - Coal (deaths)	0	39.5	24.9	22.9	22.4	22	19.1
Premature deaths from air pollution - Natural Gas (deaths)	0	3.03	2.45	3.05	3.12	2.86	2.67
Premature deaths from air pollution - Transportation (deaths)	0	18.6	18.7	18.7	18.8	18.9	18.9