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

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	1.87	2.24	0	0	0	0
Cumulative 5-yr (billion \$2018)							
Sales of cooking units - Electric Resistance (%)	41.9	54.2	92.2	99.6	100	100	100
Sales of cooking units - Gas (%)	58.1	45.8	7.83	0.394	0	0	0
Sales of space heating units - Electric Heat Pump	5.11	20.2	63.3	85.3	88.8	89.3	89
(%)							
Sales of space heating units - Electric Resistance	6.51	10.4	5.63	3.21	2.94	2.96	2.97
(%)							
Sales of space heating units - Fossil (%)	10.2	14.7	10.2	7.32	6.18	5.78	6.11
Sales of space heating units - Gas (%)	78.2	54.7	20.9	4.15	2.05	1.95	1.94
Sales of water heating units - Electric Heat Pump	0	7.63	42.7	57.5	59.2	59.2	59.2
(%)							
Sales of water heating units - Electric Resistance	11.7	24.2	31.3	38.3	39.4	39.5	39.5
(%)							
Sales of water heating units - Gas Furnace (%)	87.3	67	24.8	2.98	0.155	0	0
Sales of water heating units - Other (%)	1.03	1.2	1.22	1.23	1.24	1.24	1.25

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 (million \$2018)	0	350	897	1,453	2,201	2,395	2,284
Public EV charging plugs - DC Fast (1000 units)	0.099	0	0.64	0	2.8	0	4.53
Public EV charging plugs - L2 (1000 units)	0.151	0	15.4	0	67.5	0	109
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 (%)	1.71	1.95	1.32	0.424	0.077	0.013	0
Vehicle sales - Light-duty - EV (%)	3.39	13.6	44	80.8	96.2	99.3	100
Vehicle sales - Light-duty - gasoline (%)	90.8	79.8	51.4	17.5	3.42	0.594	0
Vehicle sales - Light-duty - hybrid (%)	3.91	4.17	3.04	1.15	0.276	0.059	0
Vehicle sales - Light-duty - hydrogen FC (%)	0.111	0.349	0.216	0.068	0.013	0.002	0
Vehicle sales - Light-duty - other (%)	0.109	0.105	0.07	0.025	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)	61.7	61.5	59.1	55.3	51.5	49.4	48.9
Final energy use - Industry (PJ)	35.8	36.3	35.9	36.6	38.7	39.4	40.1
Final energy use - Residential (PJ)	73.6	69.9	64.4	56.2	48.8	44.3	42
Final energy use - Transportation (PJ)	268	250	222	187	156	137	129

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

Item	2020	2025	2030	2035	2040	2045	2050
Commercial HVAC investment in 2020s -	0	5,003	5,574	0	0	0	0
Cumulative 5-yr (million \$2018)							
Sales of cooking units - Electric Resistance (%)	41.9	54.6	83	88.6	88.9	88.9	88.9
Sales of cooking units - Gas (%)	58.1	45.4	17	11.4	11.1	11.1	11.1
Sales of space heating units - Electric Heat Pump	1.58	19.8	62.6	88.7	92.5	92.6	92.7
(%)							
Sales of space heating units - Electric Resistance	1.76	3.39	4.14	6.37	6.83	6.86	6.85
(%)							
Sales of space heating units - Fossil (%)	0	0.199	0.038	0.002	0	0	0

Table 4: E+ scenario -	PTI I AR 1: Efficiency	//Flectrification -	Commercial	(continued)
Table T. L. Section to	I ILLAN I. LIIICICIICI	// LICCUI IIICUUIOII	OUITITICI CIUI	loonlinacai

			2222		2212		
Item	2020	2025	2030	2035	2040	2045	2050
Sales of space heating units - Gas Furnace (%)	96.7	76.6	33.3	4.92	0.721	0.496	0.493
Sales of water heating units - Electric Heat Pump	0.016	7.95	44.7	60.9	62.8	62.9	62.9
(%)							
Sales of water heating units - Electric Resistance	0.796	4.99	22.9	34.8	36.6	36.7	36.7
(%)							
Sales of water heating units - Gas Furnace (%)	99	86.7	32.1	3.86	0.201	0	0
Sales of water heating units - Other (%)	0.192	0.382	0.382	0.383	0.381	0.382	0.382

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

Item	2020	2025	2030	2035	2040	2045	2050
Electricity distribution capital invested -	0	1.12	1.17	2.25	2.43	2.16	2.28
Cumulative 5-yr (billion \$2018)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Capital invested - Biomass power plant (billion	0	0	0	0	0	0	0
\$2018)							
Capital invested - Biomass w/ccu allam power	0	0	0	0	0	0.01	0.021
plant (billion \$2018)							
Capital invested - Biomass w/ccu power plant	0	0	0	0	0	0.014	0.004
(billion \$2018)							
Capital invested - Solar PV - Base (billion \$2018)	0	7.83	9.25	11.1	5.38	3.26	1.97
Capital invested - Solar PV - Constrained (billion	0	0.876	0	0	1.04	1.02	1.11
\$2018)							
Capital invested - Wind - Base (billion \$2018)	0	14.4	19	20.7	13.5	8.91	13.5
Capital invested - Wind - Constrained (billion	0	14.6	12.8	18.5	13.6	5.1	14.3
\$2018)							

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

Item	2020	2025	2030	2035	2040	2045	2050
Biomass power plant (GWh)	0	0	0	0	0	0	0
Biomass w/ccu allam power plant (GWh)	0	0	0	0	0	9.98	30.8
Biomass w/ccu power plant (GWh)	0	0	0	0	0	16	20.1
Solar - Base land use assumptions (GWh)	2,269	14,000	18,491	24,169	12,382	7,953	5,065
Solar - Constrained land use assumptions (GWh)	1,588	463	0	1,545	4,041	1,086	1,321
Wind - Base land use assumptions (GWh)	24,562	31,717	44,413	49,298	32,992	23,613	36,789
Wind - Constrained land use assumptions (GWh)	24,176	25,574	24,629	36,843	21,893	7,728	28,372

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

Item	2020	2025	2030	2035	2040	2045	2050
Biomass purchases (million \$2018/year)	0	0	0	0	14.2	85.6	195
Conversion capital investment - Cumulative 5-yr	0	0	0	0	203	1,035	1,602
(million \$2018)							
Number of facilities - Allam power w ccu	0	0	0	0	0	1	1
(quantity)							
Number of facilities - Beccs hydrogen (quantity)	0	0	0	0	1	3	6
Number of facilities - Diesel (quantity)	0	0	0	0	0	0	0
Number of facilities - Diesel ccu (quantity)	0	0	0	0	0	1	1
Number of facilities - Power (quantity)	0	0	0	0	0	0	0
Number of facilities - Power ccu (quantity)	0	0	0	0	0	1	1
Number of facilities - Pyrolysis (quantity)	0	0	0	0	0	0	0
Number of facilities - Pyrolysis ccu (quantity)	0	0	0	0	0	1	1
Number of facilities - Sng (quantity)	0	0	0	0	0	0	0
Number of facilities - Sng ccu (quantity)	0	0	0	0	0	1	1

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

Item	2020	2025	2030	2035	2040	2045	2050
Annual - All (MMT)	0	0	0	0	0.26	1.57	3.58
Annual - BECCS (MMT)	0	0	0	0	0.26	1.57	3.58
Annual - Cement and lime (MMT)	0	0	0	0	0	0	0
Annual - NGCC (MMT)	0	0	0	0	0	0	0
Cumulative - All (MMT)	0	0	0	0	0.26	1.83	5.41
Cumulative - BECCS (MMT)	0	0	0	0	0.26	1.83	5.41
Cumulative - Cement and lime (MMT)	0	0	0	0	0	0	0
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	3.52	5.42	10.3	13.1
Injection wells (wells)	0	0	0	4	6	12	14
Resource characterization, appraisal, permitting	0	5.15	92.7	147	147	147	147
costs (million \$2020)							
Wells and facilities construction costs (million	0	0	28.4	111	197	330	410
\$2020)							

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

Item	2020	2025	2030	2035	2040	2045	2050
All (km)	0	0	0	0	35.9	681	1,245
Cumulative investment - All (million \$2018)	0	0	0	0	20.2	379	709
Cumulative investment - Spur (million \$2018)	0	0	0	0	20.2	379	709
Cumulative investment - Trunk (million \$2018)	0	0	0	0	0	0	0
Spur (km)	0	0	0	0	35.9	681	1,245
Trunk (km)	0	0	0	0	0	0	0

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 - Permanent conservation cover (1000 tCO2e/y) Carbon sink potential - Aggressive deployment - Corn-ethanol to energy grasses (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 - 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 (1000 hectares) Land impacted for carbon sink - Aggressive deployment - Cropland measures (1000 hectares) Land impacted for carbon sink - Aggressive deployment - Permanent conservation cover (1000 hectares) Land impacted for carbon sink - Aggressive deployment - Permanent conservation cover (1000 hectares) Land impacted for carbon sink - Aggressive deployment - Total (1000 hectares)	Item	2020	2025	2050
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 - O O O -538 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 (1000 hectares) Land impacted for carbon sink - Aggressive deployment - Cropland measures (1000 hectares) Land impacted for carbon sink - Aggressive deployment - Permanent conservation cover (1000 hectares) Land impacted for carbon sink - Aggressive deployment - Permanent conservation cover (1000 hectares) Land impacted for carbon sink - Aggressive O O O 48.6 deployment - Permanent conservation cover (1000 hectares) Land impacted for carbon sink - Aggressive O O O 739	Carbon sink potential - Aggressive deployment -	0	0	0
Cropland measures (1000 tCO2e/y) Carbon sink potential - Aggressive deployment - Permanent conservation cover (1000 tCO2e/y) Carbon sink potential - Aggressive deployment - O O -538 Total (1000 tCO2e/y) Carbon sink potential - Moderate deployment - O O O O O O O O O O O O O O O O O O	Corn-ethanol to energy grasses (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 (1000 hectares) Land impacted for carbon sink - Aggressive deployment - Cropland measures (1000 hectares) Land impacted for carbon sink - Aggressive deployment - Permanent conservation cover (1000 hectares) Land impacted for carbon sink - Aggressive deployment - Permanent conservation cover (1000 hectares) Land impacted for carbon sink - Aggressive deployment - Permanent conservation cover (1000 hectares) Land impacted for carbon sink - Aggressive 0 0 739	Carbon sink potential - Aggressive deployment -	0	0	-506
Permanent conservation cover (1000 tCO2e/y) Carbon sink potential - Aggressive deployment - 0 0 0 -538 Total (1000 tCO2e/y) Carbon sink potential - Moderate deployment - 0 0 0 0 0 Corn-ethanol to energy grasses (1000 tCO2e/y) Carbon sink potential - Moderate deployment - 0 0 0 -261 Cropland measures (1000 tCO2e/y) Carbon sink potential - Moderate deployment - 0 0 -15.8 Permanent conservation cover (1000 tCO2e/y) Carbon sink potential - Moderate deployment - 0 0 -277 Total (1000 tCO2e/y) Land impacted for carbon sink - Aggressive 0 0 0 0 deployment - Corn-ethanol to energy grasses (1000 hectares) Land impacted for carbon sink - Aggressive 0 0 0 691 deployment - Cropland measures (1000 hectares) Land impacted for carbon sink - Aggressive 0 0 0 48.6 deployment - Permanent conservation cover (1000 hectares) Land impacted for carbon sink - Aggressive 0 0 0 739	Cropland measures (1000 tCO2e/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 (1000 hectares) Land impacted for carbon sink - Aggressive deployment - Cropland measures (1000 hectares) Land impacted for carbon sink - Aggressive deployment - Permanent conservation cover (1000 hectares) Land impacted for carbon sink - Aggressive deployment - Permanent conservation cover (1000 hectares) Land impacted for carbon sink - Aggressive 0 0 739	Carbon sink potential - Aggressive deployment -	0	0	-31.7
Total (1000 tC02e/y) Carbon sink potential - Moderate deployment - 0 0 0 0 Corn-ethanol to energy grasses (1000 tC02e/y) Carbon sink potential - Moderate deployment - 0 0 -261 Cropland measures (1000 tC02e/y) Carbon sink potential - Moderate deployment - 0 0 -15.8 Permanent conservation cover (1000 tC02e/y) Carbon sink potential - Moderate deployment - 0 0 -277 Total (1000 tC02e/y) Land impacted for carbon sink - Aggressive 0 0 0 0 deployment - Corn-ethanol to energy grasses (1000 hectares) Land impacted for carbon sink - Aggressive 0 0 0 691 deployment - Cropland measures (1000 hectares) Land impacted for carbon sink - Aggressive 0 0 739 Land impacted for carbon sink - Aggressive 0 0 739				
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 - 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 (1000 hectares) Land impacted for carbon sink - Aggressive deployment - Cropland measures (1000 hectares) Land impacted for carbon sink - Aggressive deployment - Permanent conservation cover (1000 hectares) Land impacted for carbon sink - Aggressive 0 0 739	Carbon sink potential - Aggressive deployment -	0	0	-538
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 (1000 hectares) Land impacted for carbon sink - Aggressive deployment - Cropland measures (1000 hectares) Land impacted for carbon sink - Aggressive deployment - Permanent conservation cover (1000 hectares) Land impacted for carbon sink - Aggressive 0 0 739 Land impacted for carbon sink - Aggressive 0 0 739	Total (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 (1000 hectares) Land impacted for carbon sink - Aggressive deployment - Cropland measures (1000 hectares) Land impacted for carbon sink - Aggressive deployment - Permanent conservation cover (1000 hectares) Land impacted for carbon sink - Aggressive deployment - Permanent conservation cover (1000 hectares) Land impacted for carbon sink - Aggressive 0 0 739	Carbon sink potential - Moderate deployment -	0	0	0
Cropland measures (1000 tCO2e/y) Carbon sink potential - Moderate deployment - Permanent conservation cover (1000 tCO2e/y) Carbon sink potential - Moderate deployment - OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO				
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 (1000 hectares) Land impacted for carbon sink - Aggressive deployment - Cropland measures (1000 hectares) Land impacted for carbon sink - Aggressive deployment - Permanent conservation cover (1000 hectares) Land impacted for carbon sink - Aggressive 0 0 739 Land impacted for carbon sink - Aggressive 0 0 739	Carbon sink potential - Moderate deployment -	0	0	-261
Permanent conservation cover (1000 tCO2e/y) Carbon sink potential - Moderate deployment -				
Carbon sink potential - Moderate deployment - Total (1000 tC02e/y) Land impacted for carbon sink - Aggressive deployment - Corn-ethanol to energy grasses (1000 hectares) Land impacted for carbon sink - Aggressive deployment - Cropland measures (1000 hectares) Land impacted for carbon sink - Aggressive deployment - Permanent conservation cover (1000 hectares) Land impacted for carbon sink - Aggressive 0 0 739		0	0	-15.8
Total (1000 tCO2e/y) Land impacted for carbon sink - Aggressive 0 0 0 0 0 0 deployment - Corn-ethanol to energy grasses (1000 hectares) Land impacted for carbon sink - Aggressive 0 0 691 deployment - Cropland measures (1000 hectares) Land impacted for carbon sink - Aggressive 0 0 48.6 deployment - Permanent conservation cover (1000 hectares) Land impacted for carbon sink - Aggressive 0 0 739				
Land impacted for carbon sink - Aggressive deployment - Corn-ethanol to energy grasses (1000 hectares) Land impacted for carbon sink - Aggressive deployment - Cropland measures (1000 hectares) Land impacted for carbon sink - Aggressive deployment - Permanent conservation cover (1000 hectares) Land impacted for carbon sink - Aggressive 0 739 Land impacted for carbon sink - Aggressive 0 739		0	0	-277
deployment - Corn-ethanol to energy grasses (1000 hectares) Land impacted for carbon sink - Aggressive deployment - Cropland measures (1000 hectares) Land impacted for carbon sink - Aggressive deployment - Permanent conservation cover (1000 hectares) Land impacted for carbon sink - Aggressive 0 0 739				
(1000 hectares) Land impacted for carbon sink - Aggressive		0	0	0
Land impacted for carbon sink - Aggressive 0 0 691 deployment - Cropland measures (1000 hectares) Land impacted for carbon sink - Aggressive 0 0 48.6 deployment - Permanent conservation cover (1000 hectares) Land impacted for carbon sink - Aggressive 0 0 739				
deployment - Cropland measures (1000 hectares) Land impacted for carbon sink - Aggressive deployment - Permanent conservation cover (1000 hectares) Land impacted for carbon sink - Aggressive 0 0 739				
hectares) Land impacted for carbon sink - Aggressive 0 48.6 deployment - Permanent conservation cover (1000 hectares) Land impacted for carbon sink - Aggressive 0 0 739		0	0	691
Land impacted for carbon sink - Aggressive 0 0 48.6 deployment - Permanent conservation cover (1000 hectares) Land impacted for carbon sink - Aggressive 0 0 739				
deployment - Permanent conservation cover [1000 hectares] Land impacted for carbon sink - Aggressive 0 0 739	•			
(1000 hectares) Land impacted for carbon sink - Aggressive 0 0 739		0	0	48.6
Land impacted for carbon sink - Aggressive 0 0 739	• •			
	· ·			
deployment - Total (1000 hectares)		0	0	739
	deployment - Total (1000 hectares)			
Land impacted for carbon sink - Moderate 0 0 0		0	0	0
deployment - Corn-ethanol to energy grasses	· ·			
(1000 hectares)	(1000 hectares)			

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

Item	2020	2025	2050
Land impacted for carbon sink - Moderate	0	0	358
deployment - Cropland measures (1000			
hectares)			
Land impacted for carbon sink - Moderate	0	0	24.3
deployment - Permanent conservation cover			
(1000 hectares)			
Land impacted for carbon sink - Moderate	0	0	382
deployment - Total (1000 hectares)			

Table 13: E+ scenario - PILLAR 6: Land sinks - Fo	rests		
Item	2020	2025	2050
Carbon sink potential - High - Accelerate regeneration (1000 tCO2e/y)	0	0	3,236
Carbon sink potential - High - All (not counting overlap) (1000 tCO2e/y)	0	0	27,508
Carbon sink potential - High - Avoid deforestation (1000 tCO2e/y)	0	0	1,156
Carbon sink potential - High - Extend rotation length (1000 tCO2e/y)	0	0	9,681
Carbon sink potential - High - Improve plantations (1000 tCO2e/y)	0	0	11.6
Carbon sink potential - High - Increase retention of HWP (1000 tCO2e/y)	0	0	103
Carbon sink potential - High - Increase trees outside forests (1000 tC02e/y)	0	0	365
Carbon sink potential - High - Reforest cropland (1000 tCO2e/y)	0	0	5,360
Carbon sink potential - High - Reforest pasture (1000 tCO2e/y)	0	0	1,215
Carbon sink potential - High - Restore productivity (1000 tC02e/y)	0	0	6,378
Carbon sink potential - Low - Accelerate regeneration (1000 tCO2e/y)	0	0	1,622
Carbon sink potential - Low - All (not counting overlap) (1000 tC02e/y)	0	0	10,623
Carbon sink potential - Low - Avoid deforestation (1000 tCO2e/y)	0	0	193
Carbon sink potential - Low - Extend rotation length (1000 tCO2e/y)	0	0	3,718
Carbon sink potential - Low - Improve plantations (1000 tC02e/y)	0	0	5.92
Carbon sink potential - Low - Increase retention of HWP (1000 tCO2e/y)	0	0	34.4
Carbon sink potential - Low - Increase trees outside forests (1000 tC02e/y)	0	0	128
Carbon sink potential - Low - Reforest cropland (1000 tCO2e/y)	0	0	2,680
Carbon sink potential - Low - Reforest pasture (1000 tCO2e/y)	0	0	92.1
Carbon sink potential - Low - Restore productivity (1000 tC02e/y)	0	0	2,150
Carbon sink potential - Mid - Accelerate regeneration (1000 tCO2e/y)	0	0	2,429
Carbon sink potential - Mid - All (not counting overlap) (1000 tCO2e/y)	0	0	19,065
Carbon sink potential - Mid - Avoid deforestation (1000 tCO2e/y)	0	0	674
Carbon sink potential - Mid - Extend rotation length (1000 tCO2e/y)	0	0	6,700
Carbon sink potential - Mid - Improve plantations (1000 tCO2e/y)	0	0	8.68
Carbon sink potential - Mid - Increase retention of HWP (1000 tC02e/y)	0	0	68.9

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

Tem	Table 13: E+ scenario - PILLAR 6: Land sinks - Fo	rests (contin	ued)	
Dutside forests (1000 tO20e/y) Carbon sink potential - Mid - Reforest cropland 0		2020	2025	2050
Carbon sink potential - Mid - Reforest cropland 0		0	0	247
Carbon sink potential - Mid - Reforest pasture 0	outside forests (1000 tCO2e/y)			
Carbon sink potential - Mid - Reforest pasture 0	Carbon sink potential - Mid - Reforest cropland	0	0	4,020
Carbon sink potential - Mid - Restore				
Carbon sink potential - Mid - Restore productivity (1000 tC02e/v) 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 - 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 - Land impacted for carbon sink potential - High - Land impacted for carbon sink potential - High - Land impacted for carbon sink potential - High - Land impacted for carbon sink potential - High - Land impacted for carbon sink potential - High - Land impacted for carbon sink potential - High - Land impacted for carbon sink potential - High - 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 for carbon sink potential - Low - O	Carbon sink potential - Mid - Reforest pasture	0	0	654
Department Company C				
Department Company C	Carbon sink potential - Mid - Restore	0	0	4,264
Land impacted for carbon sink potential - High - Avoid deforestation (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 - Detaction length (1000 hectares) Land impacted for carbon sink potential - High - Detaction length (1000 hectares) Land impacted for carbon sink potential - High - Detaction of HWP (1000 hectares) Land impacted for carbon sink potential - High - Detaction of HWP (1000 hectares) Land impacted for carbon sink potential - High - Detaction of HWP (1000 hectares) Land impacted for carbon sink potential - High - Detaction of HWP (1000 hectares) Land impacted for carbon sink potential - High - Detaction of HWP (1000 hectares) Land impacted for carbon sink potential - High - Detaction of HWP (1000 hectares) Land impacted for carbon sink potential - High - Detaction of HWP (1000 hectares) Land impacted for carbon sink potential - High - Detaction of HWP (1000 hectares) Land impacted for carbon sink potential - Low - Detaction of HWP (1000 hectares) Land impacted for carbon sink potential - Low - Detaction of HWP (1000 hectares) Land impacted for carbon sink potential - Low - Detaction of HWP (1000 hectares) Land impacted for carbon sink potential - Low - Detaction of HWP (1000 hectares) Land impacted for carbon sink potential - Low - Detaction of HWP (1000 hectares) Land impacted for carbon sink potential - Low - Detaction of HWP (1000 hectares) Land impacted for carbon sink potential - Low - Detaction of HWP (1000 hectares) Land impacted for carbon sink potential - Low - Detaction of HWP (1000 hectares) Land impacted for carbon sink potential - Low - Detaction of HWP (1000 hectares) Land impacted for carbon sink potential - Low - Detaction of HWP (1000 hectares) Land impacted for carbon sink potential - Low - Detaction of HWP (1000 hectares) Land impacted for carbon sink potential - Mid - Detaction of				
Land impacted for carbon sink potential - High - Avoid deforestation (over 30 years) (1000 hectares)		0	0	529
Land impacted for carbon sink potential - High - Avoid deforestation (over 30 years) (1000 hectares)				
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 - 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 - Low -		0	0	157
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 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 - 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 - Reforest pasture (1000 hectares) Land impacted for carbon sink potential - High - Total impacted (over 30 years) (1000 hectares) Land impacted for carbon sink potential - Low - O	·			
Extend rotation length (1000 hectares)				
Extend rotation length (1000 hectares)		0	0	4.937
Land impacted for carbon sink potential - High - Improve plantations (1000 hectares) Decided to the provided to the provid				, -
Improve plantations (1000 hectares)		0	0	4.29
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 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 - 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 - Land impacted for carbon sink potential - Low - Land impacted for carbon sink potential - Low - Land impacted for carbon sink potential - Low - Land impacted for carbon sink potential - Low - Land impacted for carbon sink potential - Low - Land impacted for carbon sink potential - Low - Land impacted for carbon sink potential - Low - Land impacted for carbon sink potential - Low - 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 pasture (1000 hectares) Land impacted for carbon sink potential - Low - Reforest pasture (1000 hectares) Land impacted for carbon sink potential - Mid - Avoid deforestation (1000 hectares) Land impacted for carbon sink potential - Mid - Avoid deforestation (1000 hectares) Land impacted for carbon sink potential - Mid -				
Increase retention of HWP (1000 hectares)		0	0	0
Land impacted for carbon sink potential - High -			0	١
Increase trees outside forests (1000 hectares)		n	n	34.7
Land impacted for carbon sink potential - High - Reforest cropland (1000 hectares) Reforest cropland (1000 hectares) Reforest pasture (1000 hectares) Land impacted for carbon sink potential - High - Restore productivity (1000 hectares) Reforest pasture (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 - 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 - Reforest 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 - 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 impacted for carbon sink potential - Mid - Restore plantations			0	0-1.1
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 - Land impacted for carbon sink potential - Low - Land impacted for carbon sink potential - Low - Land impacted for carbon sink potential - Low - Land impacted for carbon sink potential - Low - Land impacted for carbon sink potential - Low - Land impacted for carbon sink potential - Low - Land impacted for carbon sink potential - Low - Land impacted for carbon sink potential - Low - Land impacted for carbon sink potential - Low - Reforest cropland (1000 hectares) Land impacted for carbon sink potential - Low - Land impacted for carbon sink potential - Low - Reforest poductivity (1000 hectares) Land impacted for carbon sink potential - Low - Restore productivity (1000 hectares) Land impacted for carbon sink potential - Low - O O 3,786 Total impacted for carbon sink potential - Mid - Accelerate regeneration (1000 hectares) Land impacted for carbon sink potential - Mid - Accelerate regeneration (1000 hectares) Land impacted for carbon sink potential - Mid - Accelerate regeneration (1000 hectares) Land impacted for carbon sink potential - Mid - O O 3,414 Extend rotation length (1000 hectares) Land impacted for carbon sink potential - Mid - O O 3.23 Land impacted for carbon sink potential - Mid - O O O C Improve plantations (1000 hectares) Land impacted for carbon sink potential - Mid - O O O O O O O O O O		0	0	25/.
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 - 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 - Land impacted for carbon sink potential - Low - Land impacted for carbon sink potential - Low - Land impacted for carbon sink potential - Low - Land impacted for carbon sink potential - Low - Land impacted for carbon sink potential - Low - Land impacted for carbon sink potential - Low - Land impacted for carbon sink potential - Low - Land impacted for carbon sink potential - Low - 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 pasture (1000 hectares) Land impacted for carbon sink potential - Low - Reforest pasture (1000 hectares) Land impacted for carbon sink potential - Low - Reforest pasture (1000 hectares) Land impacted for carbon sink potential - Mid - Accelerate regeneration (1000 hectares) Land impacted for carbon sink potential - Mid - Accelerate regeneration (1000 hectares) Land impacted for carbon sink potential - Mid - Land impacted for carbon sink potential - Mid - Land impacted for carbon sink potential - Mid - Land impacted for carbon sink potential - Mid - Land impacted for carbon sink potential - Mid - Land impacted for carbon sink potential - Mid - Land impacted for carbon sink potential - Mid - Land impacted for carbon sink potential	·	"	0	354
Reforest pasture (1000 hectares) Land impacted for carbon sink potential - High - Restore productivity (1000 hectares) 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 - Lo		0	0	27. E
Land impacted for carbon sink potential - High - Restore productivity (1000 hectares) Land 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 - Down - Low		"	0	34.5
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 - 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 - Land impacted for carbon sink potential - Mid - Land impacted for carbon sink potential - Mid - Land impacted for carbon sink potential - Mid - Land impacted for carbon sink potential - Mid - Land impacted for carbon sink potential - Mid - Land impacted for carbon sink potential - Mid - Land impacted for carbon sink potential - Mid - Land impacted for carbon sink potential - Mid - Land impacted for carbon sink potential - Mid - Land impacted for carbon sink potential - Mid - Land impacted for carbon sink potential - Mid - Land impacted for carbon sink potential - Mid - Land impacted for carbon sink potential -			0	0.117
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		U	U	2,114
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 - Extend rotation length (1000 hectares) Land impacted for carbon sink potential - Low - Improve plantations (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 - 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 - Total impacted for carbon sink potential - Low - Total impacted for carbon sink potential - Mid - Accelerate regeneration (1000 hectares) Land impacted for carbon sink potential - Mid - Accelerate regeneration (1000 hectares) Land impacted for carbon sink potential - Mid - Extend rotation length (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)				0.1/5
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 - O O O O O O O O O O O O O O O O O O		0	U	8,165
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 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 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 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 - Mid - Description of HWP (1000 hectares) Land impacted for carbon sink potential - Mid - Description of HWP (1000 hectares) Land impacted for carbon sink potential - Mid - Description of HWP (1000 hectares) Land impacted for carbon sink potential - Mid - Description of HWP (1000 hectares) Land impacted for carbon sink potential - Mid - Description of HWP (1000 hectares) Land impacted for carbon sink potential - Mid - Description of HWP (1000 hectares) Land impacted for carbon sink potential - Mid - Description of HWP (1000 hectares) Land impacted for carbon sink potential - Mid - Description of HWP (1000 hectares) Land impacted for carbon sink potential - Mid - Description of HWP (1000 hectares) Land impacted for carbon sink potential - Mid - Description of HWP (1000 hectares) Land impacted for carbon sink potential - Mid - Description of HWP (1000 hectares) Land impacted for carbon sink potential - Mid - Description of HWP (1000 hectares) Land impacted for carbon sink potential - Mid - Description of HWP (1000 hectares) Land impa		0	0	265
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 2.15 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				
Land impacted for carbon sink potential - Low -		0	0	147
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 - 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 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 - 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)				
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 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 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 of Increase trees outside forest (1000 hectares) Land impacted for carbon sink potential - Low - 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) Land impacted for carbon sink potential - Mid - Increase retention of HWP (1000 hectares)		0	0	1,891
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 I8.3 Increase trees outside forests (1000 hectares) Land impacted for carbon sink potential - Low - O O O I77 Reforest cropland (1000 hectares) Land impacted for carbon sink potential - Low - O O O I77 Reforest pasture (1000 hectares) Land impacted for carbon sink potential - Low - O O O I,279 Restore productivity (1000 hectares) Land impacted for carbon sink potential - Low - O O O I,279 Restore productivity (1000 hectares) Land impacted for carbon sink potential - Low - O O O I,279 Restore productivity (1000 hectares) Land impacted for carbon sink potential - Mid - O O O I,279 Accelerate regeneration (1000 hectares) Land impacted for carbon sink potential - Mid - O O I52 Avoid deforestation (over 30 years) (1000 hectares) Land impacted for carbon sink potential - Mid - O O I52 Avoid deforestation length (1000 hectares) Land impacted for carbon sink potential - Mid - O O I3,414 Extend rotation length (1000 hectares) Land impacted for carbon sink potential - Mid - O O O I3,23 Improve plantations (1000 hectares) Land impacted for carbon sink potential - Mid - O O O I0 Increase retention of HWP (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				
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 posture (1000 hectares) Land impacted for carbon sink potential - Low - Increase tree for carbon sink potential - Low - Increase tree for carbon sink potential - Low - 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 - Mid - Increase retention of HWP (1000 hectares)	·	0	0	2.15
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 - OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO		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 - O O S.99 Reforest pasture (1000 hectares) Land impacted for carbon sink potential - Low - O O O I,279 Restore productivity (1000 hectares) Land impacted for carbon sink potential - Low - O O O J,786 Total impacted (over 30 years) (1000 hectares) Land impacted for carbon sink potential - Mid - O O J,787 Accelerate regeneration (1000 hectares) Land impacted for carbon sink potential - Mid - O O J,787 Avoid deforestation (over 30 years) (1000 hectares) Land impacted for carbon sink potential - Mid - O O J,7414 Extend rotation length (1000 hectares) Land impacted for carbon sink potential - Mid - O O J,7414 Extend rotation sink potential - Mid - O O J,7414 Extend rotation sink potential - Mid - O O J,7414 Extend rotation sink potential - Mid - O O J,7414 Extend rotation sink potential - Mid - O O J,7414 Extend impacted for carbon sink potential - Mid - O O J,7414 Extend rotation sink potential - Mid - O O J,7414 Extend rotation sink potential - Mid - O O J,7414 Extend rotation sink potential - Mid - O O J,7414 Extend rotation sink potential - Mid - O O O J,7414 Extend rotation sink potential - Mid - O O O J,7414 Extend rotation sink potential - Mid - O O O O O O O O O O O O O O O O O O	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 - ORTO ORTO ORTO ORTO ORTO ORTO ORTO OR	Land impacted for carbon sink potential - Low -	0	0	18.3
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 trees outside forests (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 - 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	177
Reforest pasture (1000 hectares) Land impacted for carbon sink potential - Low - Restore productivity (1000 hectares) Land impacted for carbon sink potential - Low - OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO	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 - O 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	5.99
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 - O O O O O O O O O O O O O O O O O O O	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 - O 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	1,279
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 - Extend rotation 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 O O O O O O O O O O O O O O O O O	·			
Total impacted (over 30 years) (1000 hectares) Land impacted for carbon sink potential - Mid -		0	0	3.786
Land impacted for carbon sink potential - Mid - OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO				7, 33
Accelerate regeneration (1000 hectares) Land impacted for carbon sink potential - Mid -		0	0	397
Land impacted for carbon sink potential - Mid - O O 152 Avoid deforestation (over 30 years) (1000 hectares) Land impacted for carbon sink potential - Mid - O O O 3,414 Extend rotation length (1000 hectares) Land impacted for carbon sink potential - Mid - O O O 3.23 Improve plantations (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				07.
Avoid deforestation (over 30 years) (1000 hectares) Land impacted for carbon sink potential - Mid -		0	n	152
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 - 0 0 26.5			0	102
Land impacted for carbon sink potential - Mid -	· · · · · · · · · · · · · · · · · · ·			
Extend rotation length (1000 hectares) Land impacted for carbon sink potential - Mid - 0 0 3.23 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 26.5		0	n	2 /,1/.
Land impacted for carbon sink potential - Mid - 0 0 3.23 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 26.5		"	U	3,414
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 26.5		0	0	2.00
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 26.5		U	U	3.23
Increase retention of HWP (1000 hectares) Land impacted for carbon sink potential - Mid - 0 0 26.5				
Land impacted for carbon sink potential - Mid - 0 0 26.5		0	U	U
				27.
THE THE SET THE SOUTSIDE TO PESTS (IUUU NECTA PEST)		U	U	26.5
	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	266
Reforest cropland (1000 hectares)			
Land impacted for carbon sink potential - Mid -	0	0	43.3
Reforest pasture (1000 hectares)			
Land impacted for carbon sink potential - Mid -	0	0	2,576
Restore productivity (1000 hectares)			
Land impacted for carbon sink potential - Mid -	0	0	6,878
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	0	99.3	0.084	0.084	0.061	0.039	0
(million 2019\$)							
Monetary damages from air pollution - Natural	0	28.2	18.7	13.7	12.7	7.88	3.46
Gas (million 2019\$)							
Monetary damages from air pollution -	0	215	204	159	93.1	43	16.9
Transportation (million 2019\$)							
Premature deaths from air pollution - Coal	0	11.1	0.009	0.009	0.007	0.004	0
(deaths)							
Premature deaths from air pollution - Natural	0	3.19	2.12	1.55	1.43	0.89	0.391
Gas (deaths)							
Premature deaths from air pollution -	0	24.2	23	17.8	10.5	4.84	1.9
Transportation (deaths)							

Table 15: E+ scenario - IMPACTS - Jobs

Item	2020	2025	2030	2035	2040	2045	2050
By economic sector - Agriculture (jobs)	1.46	1.68	3.41	1.3	20.1	94.9	178
By economic sector - Construction (jobs)	9,113	21,265	27,580	34,988	33,874	32,502	33,505
By economic sector - Manufacturing (jobs)	8,862	10,184	12,452	14,361	12,846	11,240	11,099
By economic sector - Mining (jobs)	14,801	12,759	10,124	7,932	5,181	3,363	1,824
By economic sector - Other (jobs)	544	2,099	3,112	4,344	4,297	4,329	4,834
By economic sector - Pipeline (jobs)	1,140	1,194	1,122	1,031	808	649	521
By economic sector - Professional (jobs)	5,801	11,806	15,764	20,749	21,352	21,511	23,142
By economic sector - Trade (jobs)	7,413	10,057	11,661	14,036	13,627	13,359	14,029
By economic sector - Utilities (jobs)	5,241	13,265	17,083	23,185	24,978	25,343	27,310
By education level - All sectors - Associates	15,243	25,056	30,537	37,788	37,021	35,777	37,351
degree or some college (jobs)							
By education level - All sectors - Bachelors	12,775	18,410	21,446	25,657	24,722	23,672	24,391
degree (jobs)							
By education level - All sectors - Doctoral degree	433	679	822	1,009	991	967	1,011
(jobs)							
By education level - All sectors - High school	21,461	33,988	40,785	49,725	47,948	45,869	47,332
diploma or less (jobs)							
By education level - All sectors - Masters or	3,003	4,497	5,311	6,448	6,301	6,105	6,357
professional degree (jobs)							
By resource sector - Biomass (jobs)	6.04	7.22	9.41	3.72	60.4	346	761
By resource sector - CO2 (jobs)	0	2.01	52.4	65.5	75.4	394	1,115
By resource sector - Coal (jobs)	1,734	742	121	10.2	7.55	5.87	4.93
By resource sector - Grid (jobs)	5,007	20,811	28,724	41,454	45,355	46,918	50,936
By resource sector - Natural Gas (jobs)	11,644	11,032	9,084	6,953	5,555	3,588	2,149
By resource sector - Nuclear (jobs)	0	0	0	0	0	0	0
By resource sector - Oil (jobs)	25,695	24,959	22,653	20,474	14,926	11,195	6,939
By resource sector - Solar (jobs)	3,984	11,105	15,166	20,050	16,842	15,307	16,591
By resource sector - Wind (jobs)	4,845	13,972	23,091	31,616	34,162	34,636	37,946
Median wages - Annual - All (\$2019 per job)	59,775	58,972	59,066	59,477	60,349	61,243	62,042
On-Site or In-Plant Training - Total jobs - 1 to 4	8,217	13,295	16,045	19,702	19,196	18,478	19,179
years (jobs)							
On-Site or In-Plant Training - Total jobs - 4 to 10	3,192	5,570	6,808	8,453	8,310	8,051	8,381
years (jobs)							
On-Site or In-Plant Training - Total jobs - None	8,583	13,402	16,097	19,642	19,035	18,292	18,998
(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	372	664	825	1,037	1,028	1,001	1,049
years (jobs)							
On-Site or In-Plant Training - Total jobs - Up to 1	32,552	49,699	59,127	71,792	69,414	66,569	68,834
year (jobs)							
On-the-Job Training - All sectors - 1 to 4 years	10,435	17,067	20,655	25,428	24,838	23,946	24,898
(jobs)							
On-the-Job Training - All sectors - 4 to 10 years	2,904	5,321	6,592	8,270	8,178	7,955	8,322
(jobs)							
On-the-Job Training - All sectors - None (jobs)	3,068	4,647	5,501	6,644	6,382	6,106	6,310
On-the-Job Training - All sectors - Over 10 years	517	803	965	1,162	1,105	1,043	1,069
(jobs)							
On-the-Job Training - All sectors - Up to 1 year	35,991	54,792	65,188	79,121	76,481	73,340	75,844
(jobs)							
Related work experience - All sectors - 1 to 4	19,667	30,250	35,995	43,757	42,409	40,730	42,129
years (jobs)							
Related work experience - All sectors - 4 to 10	12,390	19,445	23,287	28,431	27,660	26,611	27,594
years (jobs)							
Related work experience - All sectors - None	7,322	11,670	14,033	17,192	16,719	16,098	16,713
(jobs)							
Related work experience - All sectors - Over 10	3,454	5,209	6,175	7,469	7,218	6,906	7,133
years (jobs)							
Related work experience - All sectors - Up to 1	10,082	16,055	19,412	23,778	22,977	22,045	22,872
year (jobs)							
Wage income - All (million \$2019)	3,163	4,873	5,842	7,175	7,061	6,884	7,225

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

Item	2020	2025	2030	2035	2040	2045	2050
Natural gas consumption - Annual (tcf)	207	210	177	142	107	67.3	46.7
Natural gas consumption - Cumulative (tcf)	0	0	0	0	0	0	4,279
Natural gas production - Annual (tcf)	1,498	1,660	1,569	1,367	1,156	917	712
Oil consumption - Annual (million bbls)	48.3	45.5	39.3	30	21.1	14.1	8.13
Oil consumption - Cumulative (million bbls)	0	0	0	0	0	0	919
Oil production - Annual (million bbls)	298	323	324	323	256	208	139

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	1.86	2.24	0	0	0	0
Cumulative 5-yr (billion \$2018)							
Sales of cooking units - Electric Resistance (%)	41.7	43.2	48.5	62.6	82.2	94.2	98.5
Sales of cooking units - Gas (%)	58.3	56.8	51.5	37.4	17.8	5.75	1.55
Sales of space heating units - Electric Heat Pump	5.11	12.8	17.7	32.4	57.3	77.2	85.4
(%)							
Sales of space heating units - Electric Resistance	6.51	11.2	10.6	9.06	6.48	4.32	3.36
(%)							
Sales of space heating units - Fossil (%)	10.2	15.5	15.4	13.1	9.22	6.81	6.5
Sales of space heating units - Gas (%)	78.2	60.4	56.3	45.5	27	11.7	4.76
Sales of water heating units - Electric Heat Pump	0	1.41	5.41	17.1	36.2	50.8	56.8
(%)							
Sales of water heating units - Electric Resistance	11.7	23.2	24.2	26.7	31.4	36	38.4
(%)							
Sales of water heating units - Gas Furnace (%)	87.3	74.1	69.2	55	31.1	12	3.54
Sales of water heating units - Other (%)	1.03	1.2	1.22	1.23	1.24	1.24	1.25

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 (million \$2018)	0	0	56.7	119	402	1,263	1,841
Public EV charging plugs - DC Fast (1000 units)	0.099	0	0.199	0	1.04	0	2.9
Public EV charging plugs - L2 (1000 units)	0.151	0	4.8	0	25.1	0	69.9
Vehicle sales - Heavy-duty - diesel (%)	97.4	96	91.3	79.8	58.2	32.1	13.7

Table 18: E- scenario -	- PILLAR 1 [,] Efficient	rv/Flectrification -	Transportation	(continued)

Item	2020	2025	2030	2035	2040	2045	2050
Vehicle sales - Heavy-duty - EV (%)	0.498	1.45	4.11	10.8	23.6	39.5	51
Vehicle sales - Heavy-duty - gasoline (%)	0.228	0.236	0.239	0.225	0.179	0.109	0.051
Vehicle sales - Heavy-duty - hybrid (%)	0.083	0.094	0.104	0.107	0.092	0.06	0.03
Vehicle sales - Heavy-duty - hydrogen FC (%)	0.332	0.969	2.74	7.17	15.7	26.3	34
Vehicle sales - Heavy-duty - other (%)	1.5	1.28	1.46	1.95	2.25	1.96	1.14
Vehicle sales - Light-duty - diesel (%)	1.72	2.1	2.09	1.67	1.08	0.558	0.238
Vehicle sales - Light-duty - EV (%)	1.7	4.28	11	24.5	46.9	71.1	87.2
Vehicle sales - Light-duty - gasoline (%)	92.3	88.2	80.9	68.4	47.9	25.9	11.4
Vehicle sales - Light-duty - hybrid (%)	4.04	4.88	5.53	5.11	3.91	2.35	1.15
Vehicle sales - Light-duty - hydrogen FC (%)	0.113	0.385	0.335	0.259	0.186	0.104	0.048
Vehicle sales - Light-duty - other (%)	0.11	0.113	0.104	0.091	0.066	0.037	0.017
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)	61.7	61.6	61.1	60.2	58.4	56.2	54.2
Final energy use - Industry (PJ)	35.8	36.3	36.1	37.2	39.6	40.4	41.1
Final energy use - Residential (PJ)	73.6	70.2	68	65.4	60.8	55.1	49.4
Final energy use - Transportation (PJ)	268	252	231	214	201	186	169

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

Item	2020	2025	2030	2035	2040	2045	2050
Commercial HVAC investment in 2020s -	0	5,000	5,547	0	0	0	0
Cumulative 5-yr (million \$2018)							
Sales of cooking units - Electric Resistance (%)	41.9	46.2	50.2	60.8	75.4	84.6	87.8
Sales of cooking units - Gas (%)	58.1	53.8	49.8	39.2	24.6	15.4	12.2
Sales of space heating units - Electric Heat Pump	1.58	12.8	17.7	32.2	57.3	78.6	88.4
(%)							
Sales of space heating units - Electric Resistance	1.76	3.37	3.45	3.77	4.61	5.79	6.51
(%)							
Sales of space heating units - Fossil (%)	0	0.23	0.214	0.159	0.078	0.025	0.007
Sales of space heating units - Gas Furnace (%)	96.7	83.6	78.7	63.9	38	15.6	5.05
Sales of water heating units - Electric Heat Pump	0.016	1.51	5.7	18	38.2	53.7	60.3
(%)							
Sales of water heating units - Electric Resistance	0.796	2.19	4.23	10.3	21	30.4	34.7
(%)							
Sales of water heating units - Gas Furnace (%)	99	95.9	89.7	71.3	40.4	15.6	4.61
Sales of water heating units - Other (%)	0.192	0.382	0.382	0.383	0.381	0.382	0.382
	-	-					

Table 21: E- scenario - PILLAR 1: Efficiency/Electrification - Electricity demand

Item	2020	2025	2030	2035	2040	2045	2050
Electricity distribution capital invested -	0	0.866	0.891	1.24	1.3	1.97	2.11
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	-506
Cropland measures (1000 tCO2e/y)			
Carbon sink potential - Aggressive deployment -	0	0	-31.7
Permanent conservation cover (1000 tC02e/y)			
Carbon sink potential - Aggressive deployment -	0	0	-538
Total (1000 tC02e/y)			

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

Table 22. E Scenario I IEEAN O. Earla Siliko P	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	-261
Cropland measures (1000 tC02e/y)			
Carbon sink potential - Moderate deployment -	0	0	-15.8
Permanent conservation cover (1000 tC02e/y)			
Carbon sink potential - Moderate deployment -	0	0	-277
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	691
deployment - Cropland measures (1000			
hectares)			
Land impacted for carbon sink - Aggressive	0	0	48.6
deployment - Permanent conservation cover			
(1000 hectares)			
Land impacted for carbon sink - Aggressive	0	0	739
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	358
deployment - Cropland measures (1000			
hectares)			
Land impacted for carbon sink - Moderate	0	0	24.3
deployment - Permanent conservation cover			
(1000 hectares)			
Land impacted for carbon sink - Moderate	0	0	382
deployment - Total (1000 hectares)			

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

Table 25: E- Scendro - Pillar 6: Lunu Sinks - Fu			
Item	2020	2025	2050
Carbon sink potential - High - Accelerate	0	0	3,236
regeneration (1000 tCO2e/y)			
Carbon sink potential - High - All (not counting	0	0	27,508
overlap) (1000 tCO2e/y)			
Carbon sink potential - High - Avoid deforestation	0	0	1,156
(1000 tC02e/y)			
Carbon sink potential - High - Extend rotation	0	0	9,681
length (1000 tCO2e/y)			
Carbon sink potential - High - Improve	0	0	11.6
plantations (1000 tCO2e/y)			
Carbon sink potential - High - Increase retention	0	0	103
of HWP (1000 tCO2e/y)			
Carbon sink potential - High - Increase trees	0	0	365
outside forests (1000 tCO2e/y)			
Carbon sink potential - High - Reforest cropland	0	0	5,360
(1000 tC02e/y)			
Carbon sink potential - High - Reforest pasture	0	0	1,215
(1000 tC02e/y)			
Carbon sink potential - High - Restore	0	0	6,378
productivity (1000 tCO2e/y)			
Carbon sink potential - Low - Accelerate	0	0	1,622
regeneration (1000 tCO2e/y)			
Carbon sink potential - Low - All (not counting	0	0	10,623
overlap) (1000 tCO2e/y)			
Carbon sink potential - Low - Avoid deforestation	0	0	193
(1000 tCO2e/y)			
Carbon sink potential - Low - Extend rotation	0	0	3,718
length (1000 tCO2e/y)			
Carbon sink potential - Low - Improve	0	0	5.92
plantations (1000 tCO2e/y)			

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

Table 23: E- scenario - PILLAR 6: Land sinks - Fo	2020		2050
Item Carbon sink potential - Low - Increase retention	2020	2025	2050 34.4
of HWP (1000 tCO2e/y)		0	04.4
Carbon sink potential - Low - Increase trees	0	0	128
outside forests (1000 tCO2e/y)			
Carbon sink potential - Low - Reforest cropland	0	0	2,680
(1000 tC02e/y)			
Carbon sink potential - Low - Reforest pasture	0	0	92.1
(1000 tC02e/y)			
Carbon sink potential - Low - Restore	0	0	2,150
productivity (1000 tCO2e/y)			
Carbon sink potential - Mid - Accelerate	0	0	2,429
regeneration (1000 tCO2e/y)			
Carbon sink potential - Mid - All (not counting	0	0	19,065
overlap) (1000 tCO2e/y)	_	_	
Carbon sink potential - Mid - Avoid deforestation	0	0	674
(1000 tC02e/y)			. 700
Carbon sink potential - Mid - Extend rotation	0	0	6,700
length (1000 tC02e/y)	0	0	0.70
Carbon sink potential - Mid - Improve plantations	0	0	8.68
(1000 tCO2e/y)	0	0	/00
Carbon sink potential - Mid - Increase retention	0	0	68.9
of HWP (1000 tCO2e/y) Carbon sink potential - Mid - Increase trees	0	0	247
outside forests (1000 tCO2e/y)	0	0	241
Carbon sink potential - Mid - Reforest cropland	0	0	4,020
(1000 tCO2e/y)	0	0	4,020
Carbon sink potential - Mid - Reforest pasture	0	0	654
(1000 tC02e/y)		0	054
Carbon sink potential - Mid - Restore	0	0	4,264
productivity (1000 tC02e/y)		0	4,204
Land impacted for carbon sink potential - High -	0	0	529
Accelerate regeneration (1000 hectares)			027
Land impacted for carbon sink potential - High -	0	0	157
Avoid deforestation (over 30 years) (1000			
hectares)			
Land impacted for carbon sink potential - High -	0	0	4,937
Extend rotation length (1000 hectares)			
Land impacted for carbon sink potential - High -	0	0	4.29
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	34.7
Increase trees outside forests (1000 hectares)			
Land impacted for carbon sink potential - High -	0	0	354
Reforest cropland (1000 hectares)			
Land impacted for carbon sink potential - High -	0	0	34.5
Reforest pasture (1000 hectares)			
Land impacted for carbon sink potential - High -	0	0	2,114
Restore productivity (1000 hectares)			
Land impacted for carbon sink potential - High -	0	0	8,165
Total impacted (over 30 years) (1000 hectares)			
Land impacted for carbon sink potential - Low -	0	0	265
Accelerate regeneration (1000 hectares)			
Land impacted for carbon sink potential - Low -	0	0	147
Avoid deforestation (over 30 years) (1000			
hectares)			
Land impacted for carbon sink potential - Low -	0	0	1,891
Extend rotation length (1000 hectares)			
Land impacted for carbon sink potential - Low -	0	0	2.15
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)

Table 25. L- Scendillo - FILLAN O. Lund Sinks - 1 C			
Item	2020	2025	2050
Land impacted for carbon sink potential - Low -	0	0	18.3
Increase trees outside forests (1000 hectares)			
Land impacted for carbon sink potential - Low -	0	0	177
Reforest cropland (1000 hectares)			
Land impacted for carbon sink potential - Low -	0	0	5.99
Reforest pasture (1000 hectares)			
Land impacted for carbon sink potential - Low -	0	0	1,279
Restore productivity (1000 hectares)			
Land impacted for carbon sink potential - Low -	0	0	3,786
Total impacted (over 30 years) (1000 hectares)			
Land impacted for carbon sink potential - Mid -	0	0	397
Accelerate regeneration (1000 hectares)			
Land impacted for carbon sink potential - Mid -	0	0	152
Avoid deforestation (over 30 years) (1000			
hectares)			
Land impacted for carbon sink potential - Mid -	0	0	3,414
Extend rotation length (1000 hectares)			
Land impacted for carbon sink potential - Mid -	0	0	3.23
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	26.5
Increase trees outside forests (1000 hectares)			
Land impacted for carbon sink potential - Mid -	0	0	266
Reforest cropland (1000 hectares)			
Land impacted for carbon sink potential - Mid -	0	0	43.3
Reforest pasture (1000 hectares)			
Land impacted for carbon sink potential - Mid -	0	0	2,576
Restore productivity (1000 hectares)			• • •
Land impacted for carbon sink potential - Mid -	0	0	6,878
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	99.3	0.084	0.084	0.061	0.039	0
(million 2019\$)							
Monetary damages from air pollution - Natural	0	28.7	14.7	9.33	5.49	2.56	1.47
Gas (million 2019\$)							
Monetary damages from air pollution -	0	218	224	223	205	167	117
Transportation (million 2019\$)							
Premature deaths from air pollution - Coal	0	11.1	0.009	0.009	0.007	0.004	0
(deaths)							
Premature deaths from air pollution - Natural	0	3.24	1.65	1.05	0.62	0.289	0.166
Gas (deaths)							
Premature deaths from air pollution -	0	24.5	25.2	25.1	23.1	18.8	13.1
Transportation (deaths)							

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	1.87	2.24	0	0	0	0
Cumulative 5-yr (billion \$2018)							
Sales of cooking units - Electric Resistance (%)	41.9	54.2	92.2	99.6	100	100	100
Sales of cooking units - Gas (%)	58.1	45.8	7.83	0.394	0	0	0
Sales of space heating units - Electric Heat Pump	5.11	20.2	63.3	85.3	88.8	89.3	89
(%)							
Sales of space heating units - Electric Resistance	6.51	10.4	5.63	3.21	2.94	2.96	2.97
(%)							
Sales of space heating units - Fossil (%)	10.2	14.7	10.2	7.32	6.18	5.78	6.11
Sales of space heating units - Gas (%)	78.2	54.7	20.9	4.15	2.05	1.95	1.94
Sales of water heating units - Electric Heat Pump	0	7.63	42.7	57.5	59.2	59.2	59.2
(%)							

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	11.7	24.2	31.3	38.3	39.4	39.5	39.5
(%)							
Sales of water heating units - Gas Furnace (%)	87.3	67	24.8	2.98	0.155	0	0
Sales of water heating units - Other (%)	1.03	1.2	1.22	1.23	1.24	1.24	1.25

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	350	897	1,453	2,201	2,395	2,284
(million \$2018)							
Public EV charging plugs - DC Fast (1000 units)	0.099	0	0.64	0	2.8	0	4.53
Public EV charging plugs - L2 (1000 units)	0.151	0	15.4	0	67.5	0	109
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 (%)	1.71	1.95	1.32	0.424	0.077	0.013	0
Vehicle sales - Light-duty - EV (%)	3.39	13.6	44	80.8	96.2	99.3	100
Vehicle sales - Light-duty - gasoline (%)	90.8	79.8	51.4	17.5	3.42	0.594	0
Vehicle sales - Light-duty - hybrid (%)	3.91	4.17	3.04	1.15	0.276	0.059	0
Vehicle sales - Light-duty - hydrogen FC (%)	0.111	0.349	0.216	0.068	0.013	0.002	0
Vehicle sales - Light-duty - other (%)	0.109	0.105	0.07	0.025	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)	61.7	61.5	59.1	55.3	51.5	49.4	48.9
Final energy use - Industry (PJ)	35.8	36.3	35.9	36.6	38.7	39.4	40.1
Final energy use - Residential (PJ)	73.6	69.9	64.4	56.2	48.8	44.3	42
Final energy use - Transportation (PJ)	268	250	222	187	156	137	129

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

Item	2020	2025	2030	2035	2040	2045	2050
Commercial HVAC investment in 2020s -	0	5,003	5,574	0	0	0	0
Cumulative 5-yr (million \$2018)							
Sales of cooking units - Electric Resistance (%)	41.9	54.6	83	88.6	88.9	88.9	88.9
Sales of cooking units - Gas (%)	58.1	45.4	17	11.4	11.1	11.1	11.1
Sales of space heating units - Electric Heat Pump	1.58	19.8	62.6	88.7	92.5	92.6	92.7
(%)							
Sales of space heating units - Electric Resistance	1.76	3.39	4.14	6.37	6.83	6.86	6.85
(%)							
Sales of space heating units - Fossil (%)	0	0.199	0.038	0.002	0	0	0
Sales of space heating units - Gas Furnace (%)	96.7	76.6	33.3	4.92	0.721	0.496	0.493
Sales of water heating units - Electric Heat Pump	0.016	7.95	44.7	60.9	62.8	62.9	62.9
(%)							
Sales of water heating units - Electric Resistance	0.796	4.99	22.9	34.8	36.6	36.7	36.7
(%)							
Sales of water heating units - Gas Furnace (%)	99	86.7	32.1	3.86	0.201	0	0
Sales of water heating units - Other (%)	0.192	0.382	0.382	0.383	0.381	0.382	0.382

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

Item	2020	2025	2030	2035	2040	2045	2050
Electricity distribution capital invested -	0	1.12	1.17	2.25	2.43	2.16	2.28
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 - Solar PV - Base (billion \$2018)	0	8.47	15.1	7.55	2.52	8.42	7.45
Capital invested - Wind - Base (billion \$2018)	0	19.3	19.8	27.2	19.8	11.5	22.3

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

Item	2020	2025	2030	2035	2040	2045	2050
Solar - Base land use assumptions (GWh)	2,269	15,139	30,135	16,396	5,770	20,508	19,154
Solar - Constrained land use assumptions (GWh)	2,269	275	0	0	4,768	20,586	25,601
Wind - Base land use assumptions (GWh)	19,677	42,328	45,814	64,282	49,417	29,300	59,387
Wind - Constrained land use assumptions (GWh)	19,175	33,112	27,278	45,791	22,190	7,741	125,374

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

Table 32. LTNLT Scenario - FILLAN O. Luna Sinks	•		
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	-506
Cropland measures (1000 tCO2e/y)			
Carbon sink potential - Aggressive deployment -	0	0	-31.7
Permanent conservation cover (1000 tCO2e/y)			
Carbon sink potential - Aggressive deployment -	0	0	-538
Total (1000 tCO2e/y)			
Carbon sink potential - Moderate deployment -	0	0	0
Corn-ethanol to energy grasses (1000 tCO2e/y)			
Carbon sink potential - Moderate deployment -	0	0	-261
Cropland measures (1000 tCO2e/y)			
Carbon sink potential - Moderate deployment -	0	0	-15.8
Permanent conservation cover (1000 tCO2e/y)			
Carbon sink potential - Moderate deployment -	0	0	-277
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	691
deployment - Cropland measures (1000			
hectares)			
Land impacted for carbon sink - Aggressive	0	0	48.6
deployment - Permanent conservation cover			
(1000 hectares)			
Land impacted for carbon sink - Aggressive	0	0	739
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	358
deployment - Cropland measures (1000			
hectares)			
Land impacted for carbon sink - Moderate	0	0	24.3
deployment - Permanent conservation cover			
(1000 hectares)			
Land impacted for carbon sink - Moderate	0	0	382
deployment - Total (1000 hectares)			

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

Table 33: E+RE+ scenario - PILLAR 6: Land sinks	s - Forests		
Item	2020	2025	2050
Carbon sink potential - High - Accelerate	0	0	3,236
regeneration (1000 tCO2e/y)			•
Carbon sink potential - High - All (not counting	0	0	27,508
overlap) (1000 tC02e/y)			,
Carbon sink potential - High - Avoid deforestation	0	0	1,156
(1000 tC02e/y)			1,100
Carbon sink potential - High - Extend rotation	0	0	9,681
length (1000 tC02e/y)		0	7,001
Carbon sink potential - High - Improve	0	0	11.6
	0	0	11.0
plantations (1000 tC02e/y)	0	0	100
Carbon sink potential - High - Increase retention	0	0	103
of HWP (1000 tC02e/y)			0.75
Carbon sink potential - High - Increase trees	0	0	365
outside forests (1000 tCO2e/y)	_		
Carbon sink potential - High - Reforest cropland	0	0	5,360
(1000 tCO2e/y)			
Carbon sink potential - High - Reforest pasture	0	0	1,215
(1000 tCO2e/y)			
Carbon sink potential - High - Restore	0	0	6,378
productivity (1000 tCO2e/y)			
Carbon sink potential - Low - Accelerate	0	0	1,622
regeneration (1000 tCO2e/y)			
Carbon sink potential - Low - All (not counting	0	0	10,623
overlap) (1000 tC02e/y)		-	,
Carbon sink potential - Low - Avoid deforestation	0	0	193
(1000 tC02e/y)		0	170
Carbon sink potential - Low - Extend rotation	0	0	3,718
length (1000 tCO2e/y)		0	3,110
Carbon sink potential - Low - Improve	0	0	5.92
	0	U	5.92
plantations (1000 tC02e/y)		0	0//
Carbon sink potential - Low - Increase retention	0	0	34.4
of HWP (1000 tC02e/y)			100
Carbon sink potential - Low - Increase trees	0	0	128
outside forests (1000 tCO2e/y)	_		
Carbon sink potential - Low - Reforest cropland	0	0	2,680
(1000 tC02e/y)			
Carbon sink potential - Low - Reforest pasture	0	0	92.1
(1000 tC02e/y)			
Carbon sink potential - Low - Restore	0	0	2,150
productivity (1000 tCO2e/y)			
Carbon sink potential - Mid - Accelerate	0	0	2,429
regeneration (1000 tCO2e/y)			
Carbon sink potential - Mid - All (not counting	0	0	19,065
overlap) (1000 tCO2e/y)			•
Carbon sink potential - Mid - Avoid deforestation	0	0	674
(1000 tC02e/y)		9	0
Carbon sink potential - Mid - Extend rotation	0	0	6,700
length (1000 tCO2e/y)		0	0,100
Carbon sink potential - Mid - Improve plantations	0	0	0.70
	0	U	8.68
(1000 tC02e/y)			(0.0
Carbon sink potential - Mid - Increase retention	0	0	68.9
of HWP (1000 tCO2e/y)			
Carbon sink potential - Mid - Increase trees	0	0	247
outside forests (1000 tCO2e/y)			
Carbon sink potential - Mid - Reforest cropland	0	0	4,020
(1000 tC02e/y)			
Carbon sink potential - Mid - Reforest pasture	0	0	654
(1000 tC02e/y)			
	0	0	4,264
Carbon sink potennai - Min - Resince			1,20-
Carbon sink potential - Mid - Restore	0		
productivity (1000 tCO2e/y)		n	520
	0	0	529

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

lable 33: E+RE+ scenario - PILLAR 6: Land sinks	•		
Item	2020	2025	2050
Land impacted for carbon sink potential - High -	0	0	157
Avoid deforestation (over 30 years) (1000			
hectares)			
Land impacted for carbon sink potential - High -	0	0	4,937
Extend rotation length (1000 hectares)			.,, .
	0	0	4.29
Land impacted for carbon sink potential - High -	U	U	4.29
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	34.7
Increase trees outside forests (1000 hectares)			
Land impacted for carbon sink potential - High -	0	0	354
Reforest cropland (1000 hectares)	· ·	•	004
	0	0	0/ 5
Land impacted for carbon sink potential - High -	0	0	34.5
Reforest pasture (1000 hectares)			
Land impacted for carbon sink potential - High -	0	0	2,114
Restore productivity (1000 hectares)			
Land impacted for carbon sink potential - High -	0	0	8,165
Total impacted (over 30 years) (1000 hectares)			-,
Land impacted for carbon sink potential - Low -	0	0	265
	0	0	200
Accelerate regeneration (1000 hectares)			
Land impacted for carbon sink potential - Low -	0	0	147
Avoid deforestation (over 30 years) (1000			
hectares)			
Land impacted for carbon sink potential - Low -	0	0	1,891
Extend rotation length (1000 hectares)			, -
Land impacted for carbon sink potential - Low -	0	0	2.15
	U	0	2.10
Improve plantations (1000 hectares)			
Land impacted for carbon sink potential - Low -	0	0	0
Increase retention of HWP (1000 hectares)			
Land impacted for carbon sink potential - Low -	0	0	18.3
Increase trees outside forests (1000 hectares)			
Land impacted for carbon sink potential - Low -	0	0	177
Reforest cropland (1000 hectares)			
Land impacted for carbon sink potential - Low -	0	0	5.99
	U	0	5.99
Reforest pasture (1000 hectares)			1.0=0
Land impacted for carbon sink potential - Low -	0	0	1,279
Restore productivity (1000 hectares)			
Land impacted for carbon sink potential - Low -	0	0	3,786
Total impacted (over 30 years) (1000 hectares)			
Land impacted for carbon sink potential - Mid -	0	0	397
Accelerate regeneration (1000 hectares)	0	0	371
	0	0	150
Land impacted for carbon sink potential - Mid -	0	0	152
Avoid deforestation (over 30 years) (1000			
hectares)			
Land impacted for carbon sink potential - Mid -	0	0	3,414
Extend rotation length (1000 hectares)			
Land impacted for carbon sink potential - Mid -	0	0	3.23
	0	0	0.20
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	26.5
Increase trees outside forests (1000 hectares)			
Land impacted for carbon sink potential - Mid -	0	0	266
Reforest cropland (1000 hectares)	· ·	•	200
	0	0	/ 0 0
Land impacted for carbon sink potential - Mid -	0	0	43.3
Reforest pasture (1000 hectares)			
Land impacted for carbon sink potential - Mid -	0	0	2,576
Restore productivity (1000 hectares)			
Land impacted for carbon sink potential - Mid -	0	0	6,878
Total impacted (over 30 years) (1000 hectares)		-	2,0.0
iotal inipactoa (over 50 years) (1000 incotal 65)			

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

Item	2020	2025	2030	2035	2040	2045	2050
Monetary damages from air pollution - Coal	0	99.3	0.084	0.084	0.061	0.039	0
(million 2019\$)							
Monetary damages from air pollution - Natural	0	25.3	15	7.15	5.54	2.74	1.27
Gas (million 2019\$)							
Monetary damages from air pollution -	0	215	204	159	93.1	43	16.9
Transportation (million 2019\$)							
Premature deaths from air pollution - Coal	0	11.1	0.009	0.009	0.007	0.004	0
(deaths)							
Premature deaths from air pollution - Natural	0	2.86	1.69	0.808	0.626	0.31	0.144
Gas (deaths)							
Premature deaths from air pollution -	0	24.2	23	17.8	10.5	4.84	1.9
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	1.87	2.24	0	0	0	0
Cumulative 5-yr (billion \$2018)							
Sales of cooking units - Electric Resistance (%)	41.9	54.2	92.2	99.6	100	100	100
Sales of cooking units - Gas (%)	58.1	45.8	7.83	0.394	0	0	0
Sales of space heating units - Electric Heat Pump	5.11	20.2	63.3	85.3	88.8	89.3	89
(%)							
Sales of space heating units - Electric Resistance	6.51	10.4	5.63	3.21	2.94	2.96	2.97
(%)							
Sales of space heating units - Fossil (%)	10.2	14.7	10.2	7.32	6.18	5.78	6.11
Sales of space heating units - Gas (%)	78.2	54.7	20.9	4.15	2.05	1.95	1.94
Sales of water heating units - Electric Heat Pump	0	7.63	42.7	57.5	59.2	59.2	59.2
(%)							
Sales of water heating units - Electric Resistance	11.7	24.2	31.3	38.3	39.4	39.5	39.5
(%)							
Sales of water heating units - Gas Furnace (%)	87.3	67	24.8	2.98	0.155	0	0
Sales of water heating units - Other (%)	1.03	1.2	1.22	1.23	1.24	1.24	1.25

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

Table 66. ETTE 666/14/16 TIEE/IN I. Efficiency, E	-100ti ijioati	on manop	or tation				
Item	2020	2025	2030	2035	2040	2045	2050
Light-duty vehicle capital costs - Cumulative 5-yr	0	350	897	1,453	2,201	2,395	2,284
(million \$2018)							
Public EV charging plugs - DC Fast (1000 units)	0.099	0	0.64	0	2.8	0	4.53
Public EV charging plugs - L2 (1000 units)	0.151	0	15.4	0	67.5	0	109
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 (%)	1.71	1.95	1.32	0.424	0.077	0.013	0
Vehicle sales - Light-duty - EV (%)	3.39	13.6	44	80.8	96.2	99.3	100
Vehicle sales - Light-duty - gasoline (%)	90.8	79.8	51.4	17.5	3.42	0.594	0
Vehicle sales - Light-duty - hybrid (%)	3.91	4.17	3.04	1.15	0.276	0.059	0
Vehicle sales - Light-duty - hydrogen FC (%)	0.111	0.349	0.216	0.068	0.013	0.002	0
Vehicle sales - Light-duty - other (%)	0.109	0.105	0.07	0.025	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)	61.7	61.5	59.1	55.3	51.5	49.4	48.9
Final energy use - Industry (PJ)	35.8	36.3	35.9	36.6	38.7	39.4	40.1
Final energy use - Residential (PJ)	73.6	69.9	64.4	56.2	48.8	44.3	42
Final energy use - Transportation (PJ)	268	250	222	187	156	137	129

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

Item	2020	2025	2030	2035	2040	2045	2050
Commercial HVAC investment in 2020s -	0	5,003	5,574	0	0	0	0
Cumulative 5-yr (million \$2018)							
Sales of cooking units - Electric Resistance (%)	41.9	54.6	83	88.6	88.9	88.9	88.9
Sales of cooking units - Gas (%)	58.1	45.4	17	11.4	11.1	11.1	11.1
Sales of space heating units - Electric Heat Pump	1.58	19.8	62.6	88.7	92.5	92.6	92.7
(%)							
Sales of space heating units - Electric Resistance	1.76	3.39	4.14	6.37	6.83	6.86	6.85
(%)							
Sales of space heating units - Fossil (%)	0	0.199	0.038	0.002	0	0	0
Sales of space heating units - Gas Furnace (%)	96.7	76.6	33.3	4.92	0.721	0.496	0.493
Sales of water heating units - Electric Heat Pump	0.016	7.95	44.7	60.9	62.8	62.9	62.9
(%)							
Sales of water heating units - Electric Resistance	0.796	4.99	22.9	34.8	36.6	36.7	36.7
(%)							
Sales of water heating units - Gas Furnace (%)	99	86.7	32.1	3.86	0.201	0	0
Sales of water heating units - Other (%)	0.192	0.382	0.382	0.383	0.381	0.382	0.382

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

Item	2020	2025	2030	2035	2040	2045	2050
Electricity distribution capital invested -	0	1.12	1.17	2.25	2.43	2.16	2.28
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	12.8	9.98	9.31	5.41	3.1	0.516
Capital invested - Solar PV - Constrained (billion \$2018)	0	0.154	0	0.56	0	0	0
Capital invested - Wind - Base (billion \$2018)	0	8.91	9.12	16.6	9.93	5.4	11.8
Capital invested - Wind - Constrained (billion \$2018)	0	9.36	7.91	10.9	7.51	6.07	11.5

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

Item	2020	2025	2030	2035	2040	2045	2050
Solar - Base land use assumptions (GWh)	2,269	22,994	19,969	20,219	12,458	7,560	1,325
Solar - Constrained land use assumptions (GWh)	2,269	275	0	1,233	0	0	0
Wind - Base land use assumptions (GWh)	13,439	19,599	22,241	41,764	25,262	14,169	32,451
Wind - Constrained land use assumptions (GWh)	13,392	18,866	17,026	22,163	15,030	11,929	23,740

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	-506
Cropland measures (1000 tCO2e/y)			
Carbon sink potential - Aggressive deployment -	0	0	-31.7
Permanent conservation cover (1000 tCO2e/y)			
Carbon sink potential - Aggressive deployment -	0	0	-538
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	-261
Cropland measures (1000 tCO2e/y)			
Carbon sink potential - Moderate deployment -	0	0	-15.8
Permanent conservation cover (1000 tCO2e/y)			
Carbon sink potential - Moderate deployment -	0	0	-277
Total (1000 tCO2e/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	691
deployment - Cropland measures (1000			
hectares)			
Land impacted for carbon sink - Aggressive	0	0	48.6
deployment - Permanent conservation cover			
(1000 hectares)			
Land impacted for carbon sink - Aggressive	0	0	739
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	358
deployment - Cropland measures (1000			
hectares)			
Land impacted for carbon sink - Moderate	0	0	24.3
deployment - Permanent conservation cover			
(1000 hectares)			
Land impacted for carbon sink - Moderate	0	0	382
deployment - Total (1000 hectares)			

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

Table 45. L+NL- Scendillo - FILLAN G. Lund Sinks			
Item	2020	2025	2050
Carbon sink potential - High - Accelerate	0	0	3,236
regeneration (1000 tCO2e/y)			
Carbon sink potential - High - All (not counting	0	0	27,508
overlap) (1000 tCO2e/y)			
Carbon sink potential - High - Avoid deforestation	0	0	1,156
(1000 tCO2e/y)			
Carbon sink potential - High - Extend rotation	0	0	9,681
length (1000 tCO2e/y)			
Carbon sink potential - High - Improve	0	0	11.6
plantations (1000 tCO2e/y)			
Carbon sink potential - High - Increase retention	0	0	103
of HWP (1000 tCO2e/y)			
Carbon sink potential - High - Increase trees	0	0	365
outside forests (1000 tCO2e/y)			
Carbon sink potential - High - Reforest cropland	0	0	5,360
(1000 tCO2e/y)			
Carbon sink potential - High - Reforest pasture	0	0	1,215
(1000 tCO2e/y)			
Carbon sink potential - High - Restore	0	0	6,378
productivity (1000 tCO2e/y)			
Carbon sink potential - Low - Accelerate	0	0	1,622
regeneration (1000 tCO2e/y)			
Carbon sink potential - Low - All (not counting	0	0	10,623
overlap) (1000 tCO2e/y)			
Carbon sink potential - Low - Avoid deforestation	0	0	193
(1000 tCO2e/y)			
Carbon sink potential - Low - Extend rotation	0	0	3,718
length (1000 tCO2e/y)			
Carbon sink potential - Low - Improve	0	0	5.92
plantations (1000 tCO2e/y)			
Carbon sink potential - Low - Increase retention	0	0	34.4
of HWP (1000 tCO2e/y)			

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

Table 43: E+RE- scenario - PILLAR 6: Land sinks			
Item	2020	2025	2050
Carbon sink potential - Low - Increase trees	0	0	128
outside forests (1000 tC02e/y)			0.400
Carbon sink potential - Low - Reforest cropland	0	0	2,680
(1000 tC02e/y)			00.1
Carbon sink potential - Low - Reforest pasture	0	0	92.1
(1000 tC02e/y)	-		0.150
Carbon sink potential - Low - Restore	0	0	2,150
productivity (1000 tC02e/y)			0.400
Carbon sink potential - Mid - Accelerate	0	0	2,429
regeneration (1000 tC02e/y)	0		12.0/5
Carbon sink potential - Mid - All (not counting	0	0	19,065
overlap) (1000 tC02e/y)	0		/7/
Carbon sink potential - Mid - Avoid deforestation	0	0	674
(1000 tC02e/y)			, 700
Carbon sink potential - Mid - Extend rotation	0	0	6,700
length (1000 tCO2e/y)			
Carbon sink potential - Mid - Improve plantations	0	0	8.68
(1000 tC02e/y)			
Carbon sink potential - Mid - Increase retention	0	0	68.9
of HWP (1000 tCO2e/y)			
Carbon sink potential - Mid - Increase trees	0	0	247
outside forests (1000 tCO2e/y)			
Carbon sink potential - Mid - Reforest cropland	0	0	4,020
(1000 tC02e/y)			
Carbon sink potential - Mid - Reforest pasture	0	0	654
(1000 tC02e/y)			
Carbon sink potential - Mid - Restore	0	0	4,264
productivity (1000 tCO2e/y)			
Land impacted for carbon sink potential - High -	0	0	529
Accelerate regeneration (1000 hectares)			
Land impacted for carbon sink potential - High -	0	0	157
Avoid deforestation (over 30 years) (1000	-	-	
hectares)			
Land impacted for carbon sink potential - High -	0	0	4,937
Extend rotation length (1000 hectares)			.,
Land impacted for carbon sink potential - High -	0	0	4.29
Improve plantations (1000 hectares)			
Land impacted for carbon sink potential - High -	0	0	0
Increase retention of HWP (1000 hectares)	ŭ	Ğ	J
Land impacted for carbon sink potential - High -	0	0	34.7
Increase trees outside forests (1000 hectares)	5	0	04.1
Land impacted for carbon sink potential - High -	0	0	354
Reforest cropland (1000 hectares)	o	U	304
Land impacted for carbon sink potential - High -	0	0	34.5
	U	0	34.5
Reforest pasture (1000 hectares)	0		0 117
Land impacted for carbon sink potential - High -	0	0	2,114
Restore productivity (1000 hectares)			0.1/5
Land impacted for carbon sink potential - High -	0	0	8,165
Total impacted (over 30 years) (1000 hectares)			
Land impacted for carbon sink potential - Low -	0	0	265
Accelerate regeneration (1000 hectares)			
Land impacted for carbon sink potential - Low -	0	0	147
Avoid deforestation (over 30 years) (1000			
hectares)			
Land impacted for carbon sink potential - Low -	0	0	1,891
Extend rotation length (1000 hectares)			
Land impacted for carbon sink potential - Low -	0	0	2.15
Improve plantations (1000 hectares)			
Land impacted for carbon sink potential - Low -	0	0	0
Increase retention of HWP (1000 hectares)			
Land impacted for carbon sink potential - Low -	0	0	18.3
Increase trees outside forests (1000 hectares)	"		. 5.0
11101 0000 01 000 0010100 (1000 1100001 00)			

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

Item	2020	2025	2050
Land impacted for carbon sink potential - Low -	0	0	177
Reforest cropland (1000 hectares)			
Land impacted for carbon sink potential - Low -	0	0	5.99
Reforest pasture (1000 hectares)			
Land impacted for carbon sink potential - Low -	0	0	1,279
Restore productivity (1000 hectares)			
Land impacted for carbon sink potential - Low -	0	0	3,786
Total impacted (over 30 years) (1000 hectares)			
Land impacted for carbon sink potential - Mid -	0	0	397
Accelerate regeneration (1000 hectares)			
Land impacted for carbon sink potential - Mid -	0	0	152
Avoid deforestation (over 30 years) (1000			
hectares)			
Land impacted for carbon sink potential - Mid -	0	0	3,414
Extend rotation length (1000 hectares)			
Land impacted for carbon sink potential - Mid -	0	0	3.23
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	26.5
Increase trees outside forests (1000 hectares)			
Land impacted for carbon sink potential - Mid -	0	0	266
Reforest cropland (1000 hectares)			
Land impacted for carbon sink potential - Mid -	0	0	43.3
Reforest pasture (1000 hectares)			
Land impacted for carbon sink potential - Mid -	0	0	2,576
Restore productivity (1000 hectares)			
Land impacted for carbon sink potential - Mid -	0	0	6,878
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	99.3	0.084	0.084	0.061	0.039	0
(million 2019\$)							
Monetary damages from air pollution - Natural	0	28.9	18.4	16.9	19.1	9.21	2.75
Gas (million 2019\$)							
Monetary damages from air pollution -	0	215	204	159	93.1	43	16.9
Transportation (million 2019\$)							
Premature deaths from air pollution - Coal	0	11.1	0.009	0.009	0.007	0.004	0
(deaths)							
Premature deaths from air pollution - Natural	0	3.27	2.08	1.91	2.16	1.04	0.31
Gas (deaths)							
Premature deaths from air pollution -	0	24.2	23	17.8	10.5	4.84	1.9
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	1.86	2.24	0	0	0	0
Cumulative 5-yr (billion \$2018)							
Sales of cooking units - Electric Resistance (%)	41.7	43.2	48.5	62.6	82.2	94.2	98.5
Sales of cooking units - Gas (%)	58.3	56.8	51.5	37.4	17.8	5.75	1.55
Sales of space heating units - Electric Heat Pump	5.11	12.8	17.7	32.4	57.3	77.2	85.4
(%)							
Sales of space heating units - Electric Resistance	6.51	11.2	10.6	9.06	6.48	4.32	3.36
(%)							
Sales of space heating units - Fossil (%)	10.2	15.5	15.4	13.1	9.22	6.81	6.5
Sales of space heating units - Gas (%)	78.2	60.4	56.3	45.5	27	11.7	4.76
Sales of water heating units - Electric Heat Pump	0	1.41	5.41	17.1	36.2	50.8	56.8
(%)							
Sales of water heating units - Electric Resistance	11.7	23.2	24.2	26.7	31.4	36	38.4
(%)							

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 (%)	87.3	74.1	69.2	55	31.1	12	3.54
Sales of water heating units - Other (%)	1.03	1.2	1.22	1.23	1.24	1.24	1.25

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	0	0	56.7	119	402	1,263	1,841
(million \$2018)							
Public EV charging plugs - DC Fast (1000 units)	0.099	0	0.199	0	1.04	0	2.9
Public EV charging plugs - L2 (1000 units)	0.151	0	4.8	0	25.1	0	69.9
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 (%)	1.72	2.1	2.09	1.67	1.08	0.558	0.238
Vehicle sales - Light-duty - EV (%)	1.7	4.28	11	24.5	46.9	71.1	87.2
Vehicle sales - Light-duty - gasoline (%)	92.3	88.2	80.9	68.4	47.9	25.9	11.4
Vehicle sales - Light-duty - hybrid (%)	4.04	4.88	5.53	5.11	3.91	2.35	1.15
Vehicle sales - Light-duty - hydrogen FC (%)	0.113	0.385	0.335	0.259	0.186	0.104	0.048
Vehicle sales - Light-duty - other (%)	0.11	0.113	0.104	0.091	0.066	0.037	0.017
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)	61.7	61.6	61.1	60.2	58.4	56.2	54.2
Final energy use - Industry (PJ)	35.8	36.3	36.1	37.2	39.6	40.4	41.1
Final energy use - Residential (PJ)	73.6	70.2	68	65.4	60.8	55.1	49.4
Final energy use - Transportation (PJ)	268	252	231	214	201	186	169

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

2020	2025	2030	2035	2040	2045	2050
0	5,000	5,547	0	0	0	0
41.9	46.2	50.2	60.8	75.4	84.6	87.8
58.1	53.8	49.8	39.2	24.6	15.4	12.2
1.58	12.8	17.7	32.2	57.3	78.6	88.4
1.76	3.37	3.45	3.77	4.61	5.79	6.51
0	0.23	0.214	0.159	0.078	0.025	0.007
96.7	83.6	78.7	63.9	38	15.6	5.05
0.016	1.51	5.7	18	38.2	53.7	60.3
0.796	2.19	4.23	10.3	21	30.4	34.7
99	95.9	89.7	71.3	40.4	15.6	4.61
0.192	0.382	0.382	0.383	0.381	0.382	0.382
	0 41.9 58.1 1.58 1.76 0 96.7 0.016	41.9 46.2 58.1 53.8 1.58 12.8 1.76 3.37 0 0.23 96.7 83.6 0.016 1.51 0.796 2.19 99 95.9	0 5,000 5,547 41.9 46.2 50.2 58.1 53.8 49.8 1.58 12.8 17.7 1.76 3.37 3.45 0 0.23 0.214 96.7 83.6 78.7 0.016 1.51 5.7 0.796 2.19 4.23 99 95.9 89.7	0 5,000 5,547 0 41.9 46.2 50.2 60.8 58.1 53.8 49.8 39.2 1.58 12.8 17.7 32.2 1.76 3.37 3.45 3.77 0 0.23 0.214 0.159 96.7 83.6 78.7 63.9 0.016 1.51 5.7 18 0.796 2.19 4.23 10.3 99 95.9 89.7 71.3	0 5,000 5,547 0 0 41.9 46.2 50.2 60.8 75.4 58.1 53.8 49.8 39.2 24.6 1.58 12.8 17.7 32.2 57.3 1.76 3.37 3.45 3.77 4.61 0 0.23 0.214 0.159 0.078 96.7 83.6 78.7 63.9 38 0.016 1.51 5.7 18 38.2 0.796 2.19 4.23 10.3 21 99 95.9 89.7 71.3 40.4	0 5,000 5,547 0 0 0 41.9 46.2 50.2 60.8 75.4 84.6 58.1 53.8 49.8 39.2 24.6 15.4 1.58 12.8 17.7 32.2 57.3 78.6 1.76 3.37 3.45 3.77 4.61 5.79 0 0.23 0.214 0.159 0.078 0.025 96.7 83.6 78.7 63.9 38 15.6 0.016 1.51 5.7 18 38.2 53.7 0.796 2.19 4.23 10.3 21 30.4 99 95.9 89.7 71.3 40.4 15.6

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

Item	2020	2025	2030	2035	2040	2045	2050
Electricity distribution capital invested -	0	0.866	0.891	1.24	1.3	1.97	2.11
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	0	0	0	0
Capital invested - Biomass w/ccu allam power plant (billion \$2018)	0	0	0	0	0	0	0.058
Capital invested - Biomass w/ccu power plant (billion \$2018)	0	0	0	0	0	0	1.59

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

Item	2020	2025	2030	2035	2040	2045	2050
Biomass power plant (GWh)	0	0	0	0	0	0	0
Biomass w/ccu allam power plant (GWh)	0	0	0	0	0	0	57.5
Biomass w/ccu power plant (GWh)	0	0	0	0	0	0	1,784

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

Item	2020	2025	2030	2035	2040	2045	2050
Biomass purchases (million \$2018/year)	0	0	0	0	0	59.9	173
Conversion capital investment - Cumulative 5-yr	0	0	0	0	0	683	1,529
(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	1	1
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	0	0	0	0	0
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	0
Number of facilities - Sng (quantity)	0	0	0	0	0	0	0
Number of facilities - Sng ccu (quantity)	0	0	0	0	0	0	0

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	0	0.88	2.68
Annual - BECCS (MMT)	0	0	0	0	0	0.88	2.68
Annual - Cement and lime (MMT)	0	0	0	0	0	0	0
Annual - NGCC (MMT)	0	0	0	0	0	0	0
Cumulative - All (MMT)	0	0	0	0	0	0.88	3.56
Cumulative - BECCS (MMT)	0	0	0	0	0	0.88	3.56
Cumulative - Cement and lime (MMT)	0	0	0	0	0	0	0
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	1.85	6.42	11.9	15.8	16.7
Injection wells (wells)	0	0	2	6	10	16	20
Resource characterization, appraisal, permitting costs (million \$2020)	0	5.15	127	204	204	204	204
Wells and facilities construction costs (million \$2020)	0	0	40.3	157	280	468	581

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

Item	2020	2025	2030	2035	2040	2045	2050
All (km)	0	0	0	0	0	9.01	200
Cumulative investment - All (million \$2018)	0	0	0	0	0	6.22	152
Cumulative investment - Spur (million \$2018)	0	0	0	0	0	6.22	152
Cumulative investment - Trunk (million \$2018)	0	0	0	0	0	0	0
Spur (km)	0	0	0	0	0	9.01	200
Trunk (km)	0	0	0	0	0	0	0

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

Table 56: E-B+ scenario - PILLAR 6: Land sinks			
Item	2020	2025	2050
Carbon sink potential - Aggressive deployment -	0	0	-34.2
Corn-ethanol to energy grasses (1000 tCO2e/y)			
Carbon sink potential - Aggressive deployment -	0	0	-482
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 tCO2e/y)			
Carbon sink potential - Aggressive deployment -	0	0	-29
Permanent conservation cover (1000 tCO2e/y)			
Carbon sink potential - Aggressive deployment -	0	0	-546
Total (1000 tC02e/y)			
Carbon sink potential - Moderate deployment -	0	0	-34.2
Corn-ethanol to energy grasses (1000 tCO2e/y)			
Carbon sink potential - Moderate deployment -	0	0	-248
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 tC02e/y)		•	Ü
Carbon sink potential - Moderate deployment -	0	0	-14.5
Permanent conservation cover (1000 tCO2e/y)		0	-14.5
Carbon sink potential - Moderate deployment -	0	0	-297
Total (1000 tCO2e/y)		0	-271
Land impacted for carbon sink - Aggressive	0	0	37.6
deployment - Corn-ethanol to energy grasses	"	U	31.0
(1000 hectares)			
Land impacted for carbon sink - Aggressive	0	0	1,615
	0	0	1,015
deployment - Cropland measures (1000			
hectares)	0	0	0.10
Land impacted for carbon sink - Aggressive	0	0	3.18
deployment - Cropland to woody energy crops			
(1000 hectares)	0		
Land impacted for carbon sink - Aggressive	0	0	0
deployment - Pasture to energy crops (1000			
hectares)		0	
Land impacted for carbon sink - Aggressive	0	0	44.5
deployment - Permanent conservation cover			
(1000 hectares)			
Land impacted for carbon sink - Aggressive	0	0	1,700
deployment - Total (1000 hectares)			
Land impacted for carbon sink - Moderate	0	0	37.6
deployment - Corn-ethanol to energy grasses			
(1000 hectares)			
Land impacted for carbon sink - Moderate	0	0	338
deployment - Cropland measures (1000			
hectares)			
Land impacted for carbon sink - Moderate	0	0	3.18
deployment - Cropland to woody energy crops			
(1000 hectares)			
Land impacted for carbon sink - Moderate	0	0	0
deployment - Pasture to energy crops (1000			
hectares)			
Land impacted for carbon sink - Moderate	0	0	22.3
deployment - Permanent conservation cover			
(1000 hectares)			
Land impacted for carbon sink - Moderate	0	0	401
deployment - Total (1000 hectares)			
· · · · · · · · · · · · · · · · · · ·	1		

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	3,236
regeneration (1000 tCO2e/y)			
Carbon sink potential - High - All (not counting	0	0	27,508
overlap) (1000 tCO2e/y)			
Carbon sink potential - High - Avoid deforestation	0	0	1,156
(1000 tC02e/y)			
Carbon sink potential - High - Extend rotation	0	0	9,681
length (1000 tCO2e/y)			
Carbon sink potential - High - Improve	0	0	11.6
plantations (1000 tCO2e/y)			
Carbon sink potential - High - Increase retention	0	0	103
of HWP (1000 tCO2e/y)			
Carbon sink potential - High - Increase trees	0	0	365
outside forests (1000 tCO2e/y)			
Carbon sink potential - High - Reforest cropland	0	0	5,360
(1000 tC02e/y)			·
Carbon sink potential - High - Reforest pasture	0	0	1,215
(1000 tC02e/y)			•
Carbon sink potential - High - Restore	0	0	6,378
productivity (1000 tCO2e/y)			-,-
Carbon sink potential - Low - Accelerate	0	0	1,622
regeneration (1000 tC02e/y)			1,022
Carbon sink potential - Low - All (not counting	0	0	10,623
overlap) (1000 tCO2e/y)			10,020
Carbon sink potential - Low - Avoid deforestation	0	0	193
(1000 tC02e/y)		ı ı	170
Carbon sink potential - Low - Extend rotation	0	0	3,718
length (1000 tCO2e/y)		0	5,110
Carbon sink potential - Low - Improve	0	0	5.92
plantations (1000 tC02e/y)	"	0	3.72
Carbon sink potential - Low - Increase retention	0	0	34.4
of HWP (1000 tCO2e/y)	"	0	34.4
Carbon sink potential - Low - Increase trees	0	0	128
outside forests (1000 tCO2e/y)	"	0	120
Carbon sink potential - Low - Reforest cropland	0	0	2,680
(1000 tCO2e/y)	"	0	2,000
	0	0	001
Carbon sink potential - Low - Reforest pasture	0	0	92.1
(1000 tC02e/y)	0	0	0.150
Carbon sink potential - Low - Restore	0	U	2,150
productivity (1000 tC02e/y)			0.400
Carbon sink potential - Mid - Accelerate	0	0	2,429
regeneration (1000 tC02e/y)			40.075
Carbon sink potential - Mid - All (not counting	0	0	19,065
overlap) (1000 tC02e/y)			
Carbon sink potential - Mid - Avoid deforestation	0	0	674
(1000 tC02e/y)			
Carbon sink potential - Mid - Extend rotation	0	0	6,700
length (1000 tC02e/y)			
Carbon sink potential - Mid - Improve plantations	0	0	8.68
(1000 tC02e/y)			
Carbon sink potential - Mid - Increase retention	0	0	68.9
of HWP (1000 tCO2e/y)			
Carbon sink potential - Mid - Increase trees	0	0	247
outside forests (1000 tCO2e/y)			
Carbon sink potential - Mid - Reforest cropland	0	0	4,020
(1000 tCO2e/y)			
Carbon sink potential - Mid - Reforest pasture	0	0	654
(1000 tC02e/y)		-	
Carbon sink potential - Mid - Restore	0	0	4,264
productivity (1000 tC02e/y)			.,20-1
Land impacted for carbon sink potential - High -	0	0	529
Accelerate regeneration (1000 hectares)		·	027
- According to a control attorn (1000 Hectal es)			

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	157
Avoid deforestation (over 30 years) (1000			
hectares)			
Land impacted for carbon sink potential - High -	0	0	4,937
Extend rotation length (1000 hectares)			
Land impacted for carbon sink potential - High -	0	0	4.29
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	34.7
Increase trees outside forests (1000 hectares)			0
Land impacted for carbon sink potential - High -	0	0	354
Reforest cropland (1000 hectares)			
Land impacted for carbon sink potential - High -	0	0	34.5
Reforest pasture (1000 hectares)			04.0
Land impacted for carbon sink potential - High -	0	0	2,114
Restore productivity (1000 hectares)		0	2,114
Land impacted for carbon sink potential - High -	0	0	8,165
		0	0,100
Total impacted (over 30 years) (1000 hectares) Land impacted for carbon sink potential - Low -	0	0	265
	"	U	200
Accelerate regeneration (1000 hectares)	-		1/7
Land impacted for carbon sink potential - Low -	0	0	147
Avoid deforestation (over 30 years) (1000			
hectares)			1.001
Land impacted for carbon sink potential - Low -	0	0	1,891
Extend rotation length (1000 hectares)		_	
Land impacted for carbon sink potential - Low -	0	0	2.15
Improve plantations (1000 hectares)			
Land impacted for carbon sink potential - Low -	0	0	0
Increase retention of HWP (1000 hectares)			
Land impacted for carbon sink potential - Low -	0	0	18.3
Increase trees outside forests (1000 hectares)			
Land impacted for carbon sink potential - Low -	0	0	177
Reforest cropland (1000 hectares)			
Land impacted for carbon sink potential - Low -	0	0	5.99
Reforest pasture (1000 hectares)			
Land impacted for carbon sink potential - Low -	0	0	1,279
Restore productivity (1000 hectares)			
Land impacted for carbon sink potential - Low -	0	0	3,786
Total impacted (over 30 years) (1000 hectares)			,
Land impacted for carbon sink potential - Mid -	0	0	397
Accelerate regeneration (1000 hectares)			٥,,
Land impacted for carbon sink potential - Mid -	0	0	152
Avoid deforestation (over 30 years) (1000			.02
hectares)			
Land impacted for carbon sink potential - Mid -	0	0	3,414
Extend rotation length (1000 hectares)		0	3,414
Land impacted for carbon sink potential - Mid -	0	0	3.23
		0	3.23
Improve plantations (1000 hectares)		0	
Land impacted for carbon sink potential - Mid -	0	0	0
Increase retention of HWP (1000 hectares)			0/5
Land impacted for carbon sink potential - Mid -	0	0	26.5
Increase trees outside forests (1000 hectares)			
Land impacted for carbon sink potential - Mid -	0	0	266
Reforest cropland (1000 hectares)			
Land impacted for carbon sink potential - Mid -	0	0	43.3
Reforest pasture (1000 hectares)			
Land impacted for carbon sink potential - Mid -	0	0	2,576
Restore productivity (1000 hectares)			
Land impacted for carbon sink potential - Mid -	0	0	6,878
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	1.8	1.89	0	0	0	0
Cumulative 5-yr (billion \$2018)							
Sales of cooking units - Electric Resistance (%)	41.1	41.1	41.1	41.1	41.1	41.1	41.1
Sales of cooking units - Gas (%)	58.9	58.9	58.9	58.9	58.9	58.9	58.9
Sales of space heating units - Electric Heat Pump	3.87	20.3	20.9	21.9	22.8	23.5	24.1
(%)							
Sales of space heating units - Electric Resistance	6.66	10.4	10.2	10.1	9.98	9.54	8.77
(%)							
Sales of space heating units - Fossil (%)	10.3	13.6	13.9	13.5	12	11	11.9
Sales of space heating units - Gas (%)	79.2	55.7	55	54.5	55.3	55.9	55.2
Sales of water heating units - Electric Heat Pump	0	0	0	0	0	0	0
(%)							
Sales of water heating units - Electric Resistance	11.7	23	23.1	23.2	23.3	23.3	23.4
(%)							
Sales of water heating units - Gas Furnace (%)	87.3	75.8	75.7	75.6	75.5	75.4	75.4
Sales of water heating units - Other (%)	1.03	1.2	1.22	1.23	1.24	1.24	1.25

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 (%)	1.71	2.1	2.21	2.06	1.86	1.73	1.65
Vehicle sales - Light-duty - EV (%)	3.04	4.93	5.65	6.91	8.45	9.89	11
Vehicle sales - Light-duty - gasoline (%)	91.1	87.7	85.8	84.1	82.2	80.2	78.6
Vehicle sales - Light-duty - hybrid (%)	3.93	4.8	5.9	6.47	7.08	7.73	8.29
Vehicle sales - Light-duty - hydrogen FC (%)	0.112	0.382	0.355	0.318	0.316	0.318	0.329
Vehicle sales - Light-duty - other (%)	0.109	0.113	0.11	0.11	0.11	0.109	0.112
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)	61.7	62.9	63.8	63.9	64.3	66	69.1
Final energy use - Industry (PJ)	35.8	37.5	38.4	40	41.7	44.3	47
Final energy use - Residential (PJ)	73.6	70.7	70.1	70.3	71.2	72.7	74
Final energy use - Transportation (PJ)	268	252	233	221	221	228	236

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

Item	2020	2025	2030	2035	2040	2045	2050
Commercial HVAC investment in 2020s -	0	4,936	5,160	0	0	0	0
Cumulative 5-yr (million \$2018)							
Sales of cooking units - Electric Resistance (%)	41.9	44.7	44.7	44.6	44.4	44.5	44.6
Sales of cooking units - Gas (%)	58.1	55.3	55.3	55.4	55.6	55.5	55.4
Sales of space heating units - Electric Heat Pump	1.58	19.9	53.5	75.1	78.5	78.8	78.8
(%)							
Sales of space heating units - Electric Resistance	1.76	4.5	9.3	15.8	20	20.6	20.7
(%)							
Sales of space heating units - Fossil (%)	0	0.211	0.115	0.034	0.005	0	0
Sales of space heating units - Gas Furnace (%)	96.7	75.4	37.1	9.08	1.57	0.556	0.495
Sales of water heating units - Electric Heat Pump	0.016	0.03	0.03	0.03	0.03	0.03	0.03
(%)							

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	0.796	1.46	1.46	1.47	1.46	1.47	1.47
(%)							
Sales of water heating units - Gas Furnace (%)	99	98.1	98.1	98.1	98.1	98.1	98.1
Sales of water heating units - Other (%)	0.192	0.382	0.382	0.383	0.381	0.382	0.382

Table 62: REF scenario - PILLAR 1: Efficiency/Electrification - Electricity demand

Item	2020	2025	2030	2035	2040	2045	2050
Electricity distribution capital invested -	0	0.941	0.974	1.68	1.79	1.79	1.89
Cumulative 5-yr (billion \$2018)							

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

Table 63: REF scenario - PILLAR 6: Land sinks - F	Forests			
Item	2020	2025	2030	2050
Business-as-usual carbon sink - Natural uptake (Mt CO2e/y)	-11.8	0	3.33	0.955
Business-as-usual carbon sink - Retained in Hardwood Products (Mt CO2e/y)	-0.028	0	-0.058	-0.061
Business-as-usual carbon sink - Total (Mt CO2e/y)	-11.8	0	3.27	0.894
Carbon sink potential - High - Accelerate	0	0	0	3,236
regeneration (1000 tCO2e/y)	0	0	0	•
Carbon sink potential - High - All (not counting overlap) (1000 tCO2e/y)	0	0	0	27,508
Carbon sink potential - High - Avoid deforestation (1000 tCO2e/y)	0	0	0	1,156
Carbon sink potential - High - Extend rotation length (1000 tCO2e/y)	0	0	0	9,681
Carbon sink potential - High - Improve plantations (1000 tCO2e/y)	0	0	0	11.6
Carbon sink potential - High - Increase retention of HWP (1000 tC02e/y)	0	0	0	103
Carbon sink potential - High - Increase trees outside forests (1000 tCO2e/y)	0	0	0	365
Carbon sink potential - High - Reforest cropland (1000 tCO2e/y)	0	0	0	5,360
Carbon sink potential - High - Reforest pasture (1000 tC02e/y)	0	0	0	1,215
Carbon sink potential - High - Restore productivity (1000 tC02e/y)	0	0	0	6,378
Carbon sink potential - Low - Accelerate regeneration (1000 tCO2e/y)	0	0	0	1,622
Carbon sink potential - Low - All (not counting overlap) (1000 tCO2e/y)	0	0	0	10,623
Carbon sink potential - Low - Avoid deforestation (1000 tCO2e/y)	0	0	0	193
Carbon sink potential - Low - Extend rotation length (1000 tC02e/y)	0	0	0	3,718
Carbon sink potential - Low - Improve	0	0	0	5.92
plantations (1000 tC02e/y) Carbon sink potential - Low - Increase retention of LWD (1000 tC02e/y)	0	0	0	34.4
of HWP (1000 tCO2e/y) Carbon sink potential - Low - Increase trees	0	0	0	128
outside forests (1000 tCO2e/y) Carbon sink potential - Low - Reforest cropland	0	0	0	2,680
(1000 tCO2e/y) Carbon sink potential - Low - Reforest pasture	0	0	0	92.1
(1000 tCO2e/y) Carbon sink potential - Low - Restore	0	0	0	2,150
productivity (1000 tCO2e/y) Carbon sink potential - Mid - Accelerate	0	0	0	2,429
regeneration (1000 tCO2e/y) Carbon sink potential - Mid - All (not counting	0	0	0	19,065
overlap) (1000 tCO2e/y)				

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

Table 63: REF scenario - PILLAR 6: Land sinks - I	•	ntinued)		
Item	2020	2025	2030	2050
Carbon sink potential - Mid - Avoid deforestation (1000 tCO2e/y)	0	0	0	674
Carbon sink potential - Mid - Extend rotation length (1000 tC02e/y)	0	0	0	6,700
Carbon sink potential - Mid - Improve plantations	0	0	0	8.68
(1000 tC02e/y) Carbon sink potential - Mid - Increase retention	0	0	0	68.9
of HWP (1000 tC02e/y) Carbon sink potential - Mid - Increase trees	0	0	0	247
outside forests (1000 tCO2e/y) Carbon sink potential - Mid - Reforest cropland	0	0	0	4,020
(1000 tC02e/y)	0	0	0	
Carbon sink potential - Mid - Reforest pasture (1000 tCO2e/y)				654
Carbon sink potential - Mid - Restore productivity (1000 tC02e/y)	0	0	0	4,264
Land impacted for carbon sink potential - High - Accelerate regeneration (1000 hectares)	0	0	0	529
Land impacted for carbon sink potential - High - Avoid deforestation (over 30 years) (1000	0	0	0	157
hectares)				
Land impacted for carbon sink potential - High - Extend rotation length (1000 hectares)	0	0	0	4,937
Land impacted for carbon sink potential - High - Improve plantations (1000 hectares)	0	0	0	4.29
Land impacted for carbon sink potential - High - Increase retention of HWP (1000 hectares)	0	0	0	0
Land impacted for carbon sink potential - High -	0	0	0	34.7
Increase trees outside forests (1000 hectares) Land impacted for carbon sink potential - High -	0	0	0	354
Reforest cropland (1000 hectares) Land impacted for carbon sink potential - High -	0	0	0	34.5
Reforest pasture (1000 hectares) Land impacted for carbon sink potential - High -	0	0	0	2,114
Restore productivity (1000 hectares) Land impacted for carbon sink potential - High -	0	0	0	8,165
Total impacted (over 30 years) (1000 hectares) Land impacted for carbon sink potential - Low -	0	0	0	265
Accelerate regeneration (1000 hectares)				
Land impacted for carbon sink potential - Low - Avoid deforestation (over 30 years) (1000 hectares)	0	0	0	147
Land impacted for carbon sink potential - Low - Extend rotation length (1000 hectares)	0	0	0	1,891
Land impacted for carbon sink potential - Low - Improve plantations (1000 hectares)	0	0	0	2.15
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	18.3
Increase trees outside forests (1000 hectares) Land impacted for carbon sink potential - Low -	0	0	0	177
Reforest cropland (1000 hectares) Land impacted for carbon sink potential - Low -	0	0	0	5.99
Reforest pasture (1000 hectares) Land impacted for carbon sink potential - Low -	0	0	0	
Restore productivity (1000 hectares)			-	1,279
Land impacted for carbon sink potential - Low - Total impacted (over 30 years) (1000 hectares)	0	0	0	3,786
Land impacted for carbon sink potential - Mid - Accelerate regeneration (1000 hectares)	0	0	0	397
Land impacted for carbon sink potential - Mid - Avoid deforestation (over 30 years) (1000 hectares)	0	0	0	152

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	3,414
Extend rotation length (1000 hectares)				
Land impacted for carbon sink potential - Mid -	0	0	0	3.23
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	26.5
Increase trees outside forests (1000 hectares)				
Land impacted for carbon sink potential - Mid -	0	0	0	266
Reforest cropland (1000 hectares)				
Land impacted for carbon sink potential - Mid -	0	0	0	43.3
Reforest pasture (1000 hectares)				
Land impacted for carbon sink potential - Mid -	0	0	0	2,576
Restore productivity (1000 hectares)				
Land impacted for carbon sink potential - Mid -	0	0	0	6,878
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	185	107	48	36.9	33	31.3
Monetary damages from air pollution - Natural Gas (million 2019\$)	0	31.8	34.1	35.4	27.3	28.4	24.4
Monetary damages from air pollution - Transportation (million 2019\$)	0	218	228	238	250	262	274
Premature deaths from air pollution - Coal (deaths)	0	20.8	12	5.38	4.14	3.71	3.52
Premature deaths from air pollution - Natural Gas (deaths)	0	3.59	3.85	4	3.08	3.21	2.76
Premature deaths from air pollution - Transportation (deaths)	0	24.5	25.6	26.8	28.1	29.5	30.9