

Climate Goals for New Zealand in 2030:

*An Ambitious Domestic Emissions Target
within an Appropriate Share of the Global Budget*

ANNEX C

**National Responsibility:
Global methodologies and the NZ calculation**

Contents

(a) The Climate Equity Reference Framework: Methodology	2
(b) Calculations for 2030: Global and New Zealand	4
(c) National Allocations and Budgets	9

(a) The Climate Equity Reference Framework: Methodology

The Climate Equity Reference Project (CERP, climateequityreference.org), which adopts the Climate Equity Reference Framework (CERF) allows the national share of each country in the global abatement effort to be determined by selecting specific equity-related settings and other key parameters.

The CERP Calculator presents results for a selected subset of the settings available, chosen to allow an exploration of the most important and politically relevant parameters:

- Ambition: three global abatement pathways, assessed in light of the global carbon budget
- Equity: three equity settings relating to capacity and three relating to historical responsibility,
- Abatement: three methods of estimating domestic reductions.

The settings incorporated in the Calculator are:

1. Level of Global Ambition: Select a mitigation pathway:

1.5°C Standard (greater than, or equal to, 50% chance of staying below 1.5°C in 2100)

2°C Standard (greater than 66% chance of staying within 2°C in 2100)

G8 pathway (weaker pathway, consistent with the 2009 G8 Declaration in L'Aquila)

2. Responsibilities & Capacities (common but differentiated):

(a) Responsibility vs. Capacity, relative weight

100% Responsibility

50% Responsibility / 50% Capacity

100% Capacity

(b) Progressivity, between and within countries

No development threshold (actually, a regressive approach)

\$7,500 development threshold

\$7,500 development threshold, plus additional progressivity factors

Historical Responsibility (Start Date): Calculate responsibility based on emissions cumulative since:

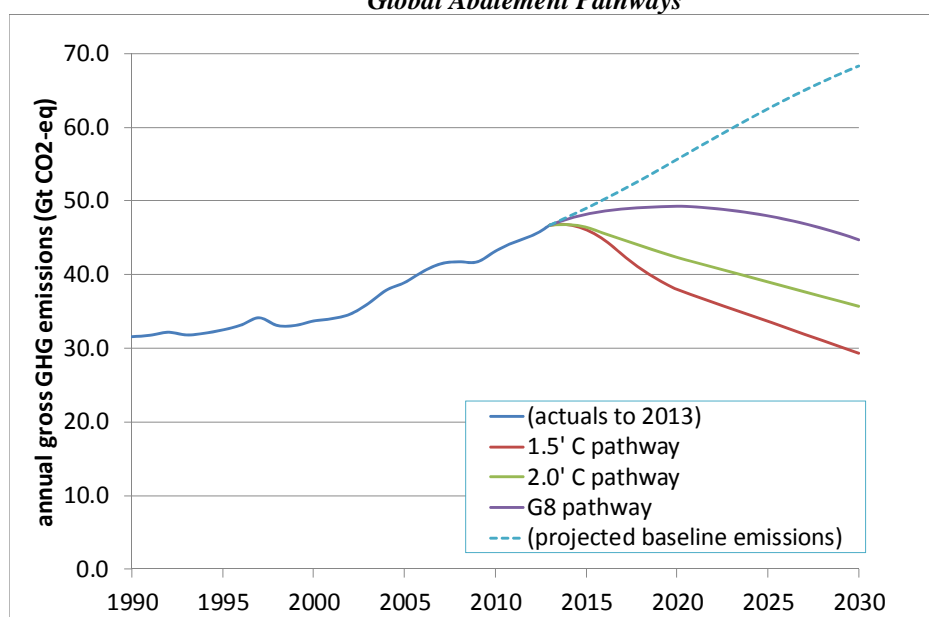
1850

1950

1990

Three abatement pathways, corresponding to three global abatement budgets, each representing a goal that is politically relevant in the current abatement debate. Each of the pathways is referenced to the greenhouse gas budgets reported in the IPCC's 2013 Fifth Assessment Report (AR5) for the purpose of estimating their likelihood of keeping warming below 2°C. These are shown in Figure 1.

Figure 1
Global Abatement Pathways



Three global mitigation pathways considered under the CERP framework – a 1.5°C pathway, a 2°C Standard pathway (>66% chance of keeping warming from CO₂ alone to <2°C, cf IPCC AR5’s ~1010 GtCO₂ budget from 2012 onwards), and a G8 pathway, with progressively greater risks of exceeding 2°C.

Source data: CER Calculator <http://calculator.climateequityreference.org/> Calculator version 3.0.0 Data version 6.8.2s, accessed 1 September 28 July 2015

The *Calculator* first asks the user to select a global abatement pathway. This choice specifies a level of ambition, and determines the required level of global abatement effort in each year, to be fairly shared among countries. Then, drawing on the core equity principles of the UNFCCC, the *Calculator* asks the user to specify a selection of ‘equity settings’. This results in a definition of capacity and responsibility, which can be calculated in a way that excludes the income and emissions of individuals below some specified threshold, such as a ‘development threshold’ that is set so as to exempt poor individuals. Drawing upon standard information sources for historic and projected data (GDP, population, emissions, etc.), each country’s share of the total global capacity and responsibility is then estimated. The resulting ‘Responsibility and Capacity Index’ (RCI) in turn determines the country’s fair share, in percentage terms, of the global abatement effort

Narrowing the choice of settings

Because of the large number of permutations (at least 81 scenarios), the National Fair Shares report¹ has selected three to simplify decision-making: one level of ambition (2°C pathway); three equity settings (Low, Medium, High); and one domestic abatement estimate (Equal-proportional). The three scenarios are shown in bold in Table 1.

Table 1
The CERP Calculator Settings

Level of Ambition	G-8 pathway	1.5° C pathway	2° C pathway
Equity Settings - Capacity - Responsibility	Low Equity No progressivity 1990 onwards	Medium Equity Weak progressivity 1950 onwards	High Equity Strong progressivity 1850 onwards
Domestic Abatement Estimate	Intensity-adjusted	Equal-proportional	Income-adjusted

¹ Athanasiou T, Kartha S, Baer P. National Fair Shares: The mitigation gap – domestic action and international support; A Climate Equity Reference Project report. EcoEquity & Stockholm Environment Institute, 2014. <http://www.ecoequity.org/wp-content/uploads/2014/11/National-fair-shares.pdf>; Kartha S, Athanasiou T, Baer P. ‘Fair shares’ and intended nationally determined contributions: What can we learn from an equity review? SEI Discussion Brief, 2014. <http://www.sei-international.org/mediamanager/documents/Publications/Climate/SEI-DB-2014-INDCs-equity-analysis.pdf>

(b) Calculations for New Zealand 2030²

Key to graphs for individual countries/country groups:

— Baseline Emissions

GHG emissions baselines (these are *not* business-as-usual pathways) are calculated as counter-factual non-policy baselines. The method is convergence from recent historical growth rates to long-term (2030) growth rates from the projections of McKinsey and Co. (Version 2.1). CO₂ from land use is projected constant at at levels equal to the average of the last 10 years of historical data. GDP estimates are taken from IMF (WEO2013) through 2018 and converge to growth rates from McKinsey and Co. in 2030. See Definition, sourcing, and updating of the emissions baselines for details.

— "Fair share" allocation

National allocation trajectory, as calculated for New Zealand using the specified pathways and parameters. The mitigation implied by this allocation can be either domestic or international – The Climate Equity Reference Project effort-sharing framework says nothing about how or where it occurs.

■ ■ ■ Domestic emissions

An example domestic emissions pathway for New Zealand, one that's consistent with the selected parameters. This pathway does not describe the national fair share. Rather it is shown as a guide to thought. In this example, domestic emissions (the dotted green line) decline (relative to national BAU) at the same rate that global emissions decline below the global BAU. In the real world, a national domestic emissions trajectory will depend on the cost of domestic mitigation relative to the cost of mitigation in other countries, and on its chosen participation in international mechanisms for providing or receiving financial and technological support for mitigation.

■ Domestically-funded mitigation

Mitigation funded by New Zealand and carried out within its own borders. The fraction of a country's mitigation fair share that is discharged domestically is not specified by the CERP effort-sharing framework, but is rather a result of the international cost and mitigation sharing arrangements that it chooses to participate in.

■ Mitigation funded in other countries

Mitigation funded by New Zealand and carried out within other countries. The fraction of a country's mitigation fair share that is discharged in other countries is not specified by the CERP effort-sharing framework, but is rather a result of the international cost and mitigation sharing arrangements that it chooses to participate in.

◆ Unconditional Pledge

Emissions consistent with New Zealand's pledged emission reductions *not* conditional on other countries' actions.

● Conditional Pledge

Emissions consistent with New Zealand's pledged emission reductions conditional on other countries' actions.

² <http://gdrights.org/calculator/> Calculator version 3.0.0 Data version 6.8.2s 25 August 2015 (accessed online 1 September 2015).

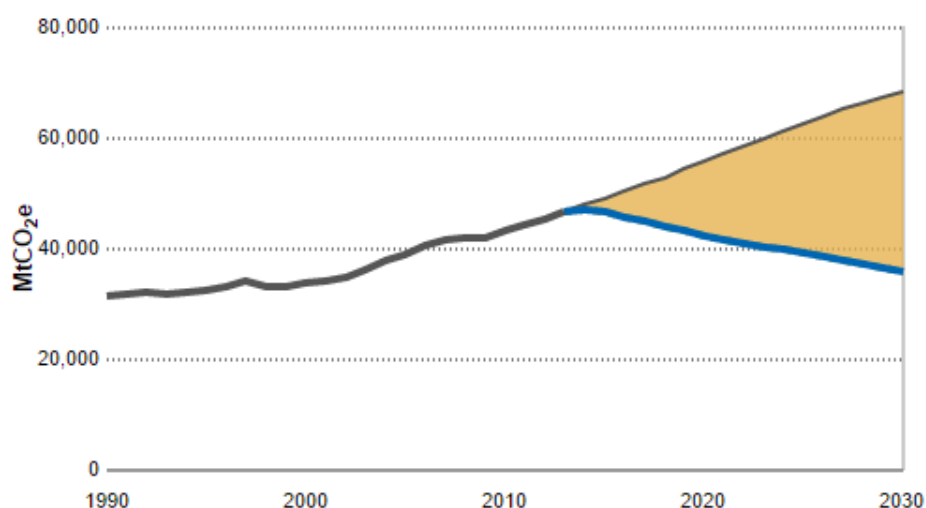
Note: These figures may be subject to revision in the future, as the methodology clarifies regional distortions by country and inconsistencies in statistical information (especially pertaining to LULUCF) supplied to the UNFCCC (see <http://climateequityreference.org/calculator-information/gdp-and-emissions-baselines/> section LUCF for caveats, with no authoritative, country-level dataset). Input data are described at <http://climateequityreference.org/calculator-information/the-climate-equity-reference-calculator-database/>, calculations at <http://calculator.climateequityreference.org/>.

Global calculation for 2030

World: gross greenhouse emissions, 2°C pathway

Country/region report in 2030 for World

Global mitigation pathway: 2°C pathway	Responsibility weight: 0.5	Development threshold: \$7,500
Progressive between thresholds: no		
Include land-use emissions: no	Include non-CO ₂ gases: yes	Include emiss. embodied in trade: no
Cumulative since: 1990	Mitigation cost as % GWP: 1.0%	Adaptation cost as % GWP: 1.0%
Use mitigation smoothing: yes	Kyoto adjustment: none	Emissions elasticity: 1.0



[Shareable Link to this view](#)

Fair shares

World baseline emissions, projected to 2030		68,302 MtCO ₂ e
Global mitigation requirement below global baseline, projected to 2030	(A)	32,607 MtCO ₂ e
World share of global Responsibility Capacity Index in 2015 to 2030 period	(B)	100%
World mitigation fair share, projected to 2030	(A × B)	
as tonnes below baseline		32,607 MtCO ₂ e
as tonnes per capita below baseline		3.9 tCO ₂ e/cap
as percent below baseline		48%
Per capita fair share of global costs, expressed in financial terms		
Mitigation costs (assuming incremental global mitigation costs = 1.0% of GWP)		\$133
Adaptation cost (assuming global adaptation costs = 1.0% of GWP)		\$133
World 1990 emissions		31,561 MtCO ₂ e
World emissions allocation, projected to 2030		
as tonnes		35,695 MtCO ₂ e
as tonnes per capita		4.3 tCO ₂ e/cap
as percent of 1990 emissions		113%
as percent above 1990 emissions		13%

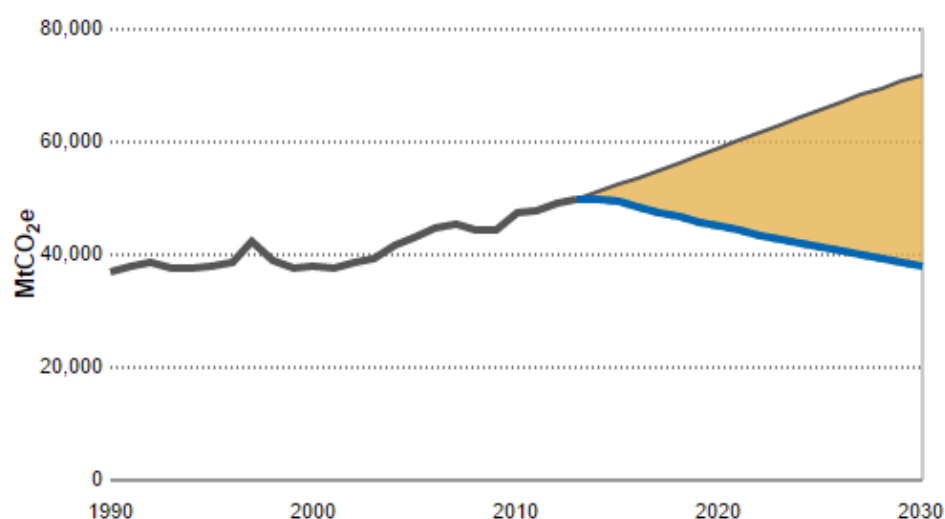
Data version: 6.8.2s (last change to database: 25 Aug 2015 18:47:28 PDT) Calculator version: 3.0.0

Greenhouse Development Rights is a project of [EcoEquity](#) and the [Stockholm Environment Institute](#) © 2008-2015

World: net greenhouse emissions (incl. LULUCF), 2°C pathway

Country/region report in 2030 for World

Global mitigation pathway: 2°C pathway	Responsibility weight: 0.5	Development threshold: \$7,500
Progressive between thresholds: no		
Include land-use emissions: yes	Include non-CO ₂ gases: yes	Include emiss. embodied in trade: no
Cumulative since: 1990	Mitigation cost as % GWP: 1.0%	Adaptation cost as % GWP: 1.0%
Use mitigation smoothing: yes	Kyoto adjustment: none	Emissions elasticity: 1.0



[Shareable Link to this view](#)

Fair shares

World baseline emissions, projected to 2030	71,423 MtCO ₂ e
Global mitigation requirement below global baseline, projected to 2030	(A) 33,682 MtCO ₂ e
World share of global Responsibility Capacity Index in 2015 to 2030 period	(B) 100%
World mitigation fair share, projected to 2030	(A × B)
as tonnes below baseline	33,682 MtCO ₂ e
as tonnes per capita below baseline	4.0 tCO ₂ e/cap
as percent below baseline	47%
Per capita fair share of global costs, expressed in financial terms	
Mitigation costs (assuming incremental global mitigation costs = 1.0% of GWP)	\$133
Adaptation cost (assuming global adaptation costs = 1.0% of GWP)	\$133
World 1990 emissions	36,841 MtCO ₂ e
World emissions allocation, projected to 2030	
as tonnes	37,741 MtCO ₂ e
as tonnes per capita	4.5 tCO ₂ e/cap
as percent of 1990 emissions	102%
as percent above 1990 emissions	2.4%

Data version: 6.8.2s (last change to database: 25 Aug 2015 18:47:28 PDT) Calculator version: 3.0.0

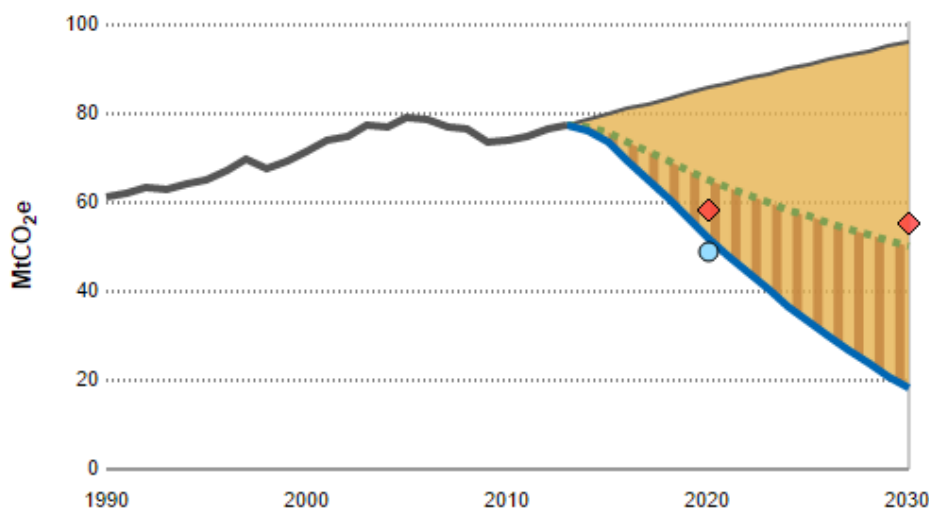
Greenhouse Development Rights is a project of [EcoEquity](#) and the [Stockholm Environment Institute](#) © 2008-2015

(i) *Country/region report in 2030 for New Zealand*

New Zealand: gross emissions, 2°C pathway, 1990 responsibility, mid-equity settings

Country/region report in 2030 for New Zealand

Global mitigation pathway: 2°C pathway	Responsibility weight: 0.5	Development threshold: \$7,500
Progressive between thresholds: no		
Include land-use emissions: no	Include non-CO ₂ gases: yes	Include emiss. embodied in trade: no
Cumulative since: 1990	Mitigation cost as % GWP: 1.0%	Adaptation cost as % GWP: 1.0%
Use mitigation smoothing: yes	Kyoto adjustment: none	Emissions elasticity: 1.0



[Shareable Link to this view](#)

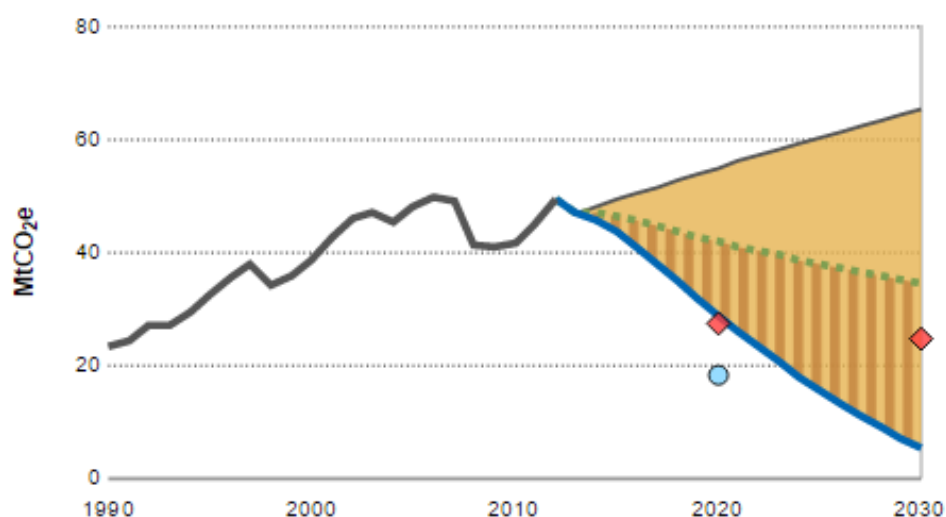
Fair shares and pledges

New Zealand baseline emissions, projected to 2030	95 MtCO ₂ e
Global mitigation requirement below global baseline, projected to 2030	(A) 32,607 MtCO ₂ e
New Zealand share of global Responsibility Capacity Index in 2015 to 2030 period	(B) 0.24%
New Zealand mitigation fair share, projected to 2030	(A × B)
as tonnes below baseline	77 MtCO ₂ e
as tonnes per capita below baseline	14.8 tCO ₂ e/cap
as percent below baseline	81%
Per capita fair share of global costs, expressed in financial terms	
Mitigation costs (assuming incremental global mitigation costs = 1.0% of GWP)	\$509
Adaptation cost (assuming global adaptation costs = 1.0% of GWP)	\$509
New Zealand 1990 emissions	61 MtCO ₂ e
New Zealand emissions allocation, projected to 2030	
as tonnes	18 MtCO ₂ e
as tonnes per capita	3.5 tCO ₂ e/cap
as percent of 1990 emissions	30%
as percent below 1990 emissions	70%
New Zealand unconditional pledge: reduce total emissions by 30% compared to 2005 by 2030	
in tonnes below baseline	41 MtCO ₂ e
in tonnes per capita below baseline	7.8 tCO ₂ e/cap
as percent below baseline	43%
Amount by which this pledge falls short of mitigation fair share	7.0 tCO ₂ e/cap

New Zealand: net emissions (incl. LULUCF), 2°C pathway, 1990 responsibility, mid-equity settings

Country/region report in 2030 for New Zealand

Global mitigation pathway: 2°C pathway	Responsibility weight: 0.5	Development threshold: \$7,500
Progressive between thresholds: no		
Include land-use emissions: yes	Include non-CO ₂ gases: yes	Include emiss. embodied in trade: no
Cumulative since: 1990	Mitigation cost as % GWP: 1.0%	Adaptation cost as % GWP: 1.0%
Use mitigation smoothing: yes	Kyoto adjustment: none	Emissions elasticity: 1.0



[Shareable Link to this view](#)

Fair shares and pledges

New Zealand baseline emissions, projected to 2030	65 MtCO ₂ e
Global mitigation requirement below global baseline, projected to 2030	(A) 33,682 MtCO ₂ e
New Zealand share of global Responsibility Capacity Index in 2015 to 2030 period	(B) 0.18%
New Zealand mitigation fair share, projected to 2030	(A × B)
as tonnes below baseline	60 MtCO ₂ e
as tonnes per capita below baseline	11.5 tCO ₂ e/cap
as percent below baseline	92%
Per capita fair share of global costs, expressed in financial terms	
Mitigation costs (assuming incremental global mitigation costs = 1.0% of GWP)	\$382
Adaptation cost (assuming global adaptation costs = 1.0% of GWP)	\$382
New Zealand 1990 emissions	23 MtCO ₂ e
New Zealand emissions allocation, projected to 2030	
as tonnes	5.4 MtCO ₂ e
as tonnes per capita	1.0 tCO ₂ e/cap
as percent of 1990 emissions	23%
as percent below 1990 emissions	77%
New Zealand unconditional pledge: reduce total emissions by 30% compared to 2005 by 2030	
in tonnes below baseline	41 MtCO ₂ e
in tonnes per capita below baseline	7.8 tCO ₂ e/cap
as percent below baseline	62%
Amount by which this pledge falls short of mitigation fair share	3.7 tCO ₂ e/cap

(c) National Allocations

Country allocations/budgets – 2' pathway, responsibility cumulative emissions since 1990, mid-equity settings

<http://gdrights.org/calculator/> Calculator version 3.0.0 Data version 6.8.2s 25 August 2015
(accessed online 1 September 2015)

Table 1: CERP allocations, by country (n=195)

key to columns:

1. country name
2. population 2015 (millions)
3. per capita GDP 2015 (\$US-PPP)
4. total gross GHG emissions 2015 (Mt CO₂-e)
5. per capita gross GHG emissions 2005 (t CO₂-e)
6. CERP framework RCI % of global gross GHG emissions 2015
(= country allocation gross emissions 2015 /world allocation gross emissions 2015) (%)
7. total CERP allocation for gross emissions for 2030 (Mt CO₂-e)
8. per capita CERP allocation for gross emissions for 2030 (= allocation/population) (t CO₂-e)
9. total CERP allocation for net emissions for 2030 (Mt CO₂-e)

country	Year 2015				CERP allocations			
	population (m)	per capita GDP	gross GHG	pc gGHG	RCI 2015	gGHG, 2030	pc gGHG, 2030	net GHG, 2030
Afghanistan	32.007	\$1,411	29.2	0.9	0.002%	51.6	1.6	53.7
Albania	3.197	\$8,544	8.1	2.5	0.007%	6.6	2.1	6.5
Algeria	40.633	\$7,622	214.8	5.3	0.140%	268.6	6.6	269.7
Angola	22.820	\$5,345	55.0	2.4	0.031%	57.8	2.5	65.0
Antigua and Barbuda	0.092	\$18,385	0.6	7.0	0.002%	0.6	6.0	0.6
Argentina	42.155	\$15,741	338.2	8.0	0.603%	202.0	4.8	214.3
Armenia	2.989	\$5,952	9.4	3.1	0.005%	9.7	3.2	9.9
Australia	23.923	\$36,715	567.6	23.7	2.161%	56.8	2.4	54.0
Austria	8.558	\$36,470	79.5	9.3	0.515%	-53.1	-6.2	-55.7
Azerbaijan	9.613	\$9,480	72.4	7.5	0.066%	55.9	5.8	56.4
Bahamas, The	0.388	\$26,143	2.9	7.4	0.011%	0.6	1.7	0.6
Bahrain	1.360	\$26,541	31.1	22.9	0.066%	19.9	14.6	19.9
Bangladesh	160.411	\$1,869	217.9	1.4	0.001%	366.8	2.3	355.0
Barbados	0.287	\$16,919	1.7	6.1	0.005%	1.1	3.8	1.1
Belarus	9.260	\$13,752	85.3	9.2	0.101%	46.5	5.0	47.3
Belgium	11.183	\$33,500	116.8	10.4	0.702%	-61.0	-5.5	-63.5
Belize	0.348	\$6,728	0.9	2.5	0.001%	0.9	2.5	8.0
Benin	10.880	\$1,486	19.0	1.8	0.000%	29.9	2.7	73.9
Bhutan	0.776	\$6,308	3.1	4.0	0.001%	3.5	4.5	3.9
Bolivia	11.025	\$5,087	56.6	5.1	0.046%	66.3	6.0	104.6
Bosnia and Herzegovina	3.820	\$7,862	38.7	10.1	0.019%	45.8	12.0	44.1
Botswana	2.056	\$14,296	12.4	6.0	0.027%	5.6	2.7	9.8
Brazil	203.657	\$10,174	1231.6	6.0	2.503%	702.0	3.4	1041.8
Brunei	0.429	\$42,442	14.9	34.7	0.039%	9.5	22.2	9.5
Bulgaria	7.113	\$12,951	61.7	8.7	0.082%	45.5	6.4	41.4
Burkina Faso	17.915	\$1,438	25.5	1.4	0.002%	33.4	1.9	40.5
Burundi	10.813	\$496	4.0	0.4	0.000%	5.1	0.5	54.9
Cambodia	15.677	\$2,512	60.3	3.8	0.003%	73.6	4.7	92.4
Cameroon	23.393	\$2,179	41.8	1.8	0.005%	48.2	2.1	78.9
Canada	35.871	\$37,310	759.4	21.2	2.998%	84.7	2.4	89.0
Cape Verde	0.508	\$3,763	0.6	1.2	0.000%	0.6	1.2	0.6
Central African Republic	4.803	\$476	189.5	39.5	0.017%	201.7	42.0	205.3
Chad	13.606	\$1,364	35.2	2.6	0.000%	39.5	2.9	42.0
Chile	17.924	\$16,550	128.3	7.2	0.306%	104.3	5.8	106.5
China	1401.587	\$9,143	14222.8	10.1	9.572%	17053.1	12.2	16993.1

Colombia	49.529	\$9,873	185.9	3.8	0.361%	134.4	2.7	163.9
Comoros	0.770	\$1,099	0.5	0.7	0.000%	0.7	0.9	0.7
Congo, Democratic Republic of the	71.246	\$817	148.6	2.1	0.000%	160.1	2.2	167.1
Congo, Republic of the	4.671	\$4,076	12.8	2.7	0.006%	13.4	2.9	13.4
Cook Islands	0.021	\$32,580	0.1	3.5	0.000%	0.0	-1.3	1.8
Costa Rica	5.002	\$11,809	12.2	2.4	0.036%	4.5	0.9	34.4
Cote d'Ivoire	21.295	\$2,078	34.3	1.6	0.003%	41.8	2.0	44.3
Croatia	4.255	\$15,754	25.1	5.9	0.069%	5.7	1.3	4.5
Cuba	11.249	\$13,666	55.5	4.9	0.072%	46.0	4.1	45.8
Cyprus	1.165	\$18,357	8.5	7.3	0.028%	2.1	1.8	1.8
Czech Republic	10.777	\$24,196	132.8	12.3	0.415%	36.4	3.4	36.1
Denmark	5.662	\$32,618	53.3	9.4	0.416%	-53.7	-9.5	-54.9
Djibouti	0.900	\$2,718	1.6	1.8	0.000%	2.5	2.8	2.5
Dominica	0.073	\$10,477	0.2	2.8	0.000%	0.2	2.4	0.2
Dominican Republic	10.652	\$10,040	33.5	3.1	0.058%	26.6	2.5	27.9
Ecuador	16.226	\$9,361	59.4	3.7	0.092%	54.8	3.4	72.4
Egypt	84.706	\$5,995	310.2	3.7	0.111%	422.6	5.0	425.6
El Salvador	6.426	\$6,335	11.1	1.7	0.015%	9.4	1.5	12.4
Equatorial Guinea	0.799	\$20,038	6.6	8.3	0.015%	1.9	2.3	2.9
Eritrea	6.738	\$459	4.9	0.7	0.000%	6.1	0.9	6.6
Estonia	1.280	\$20,777	19.7	15.4	0.043%	11.6	9.1	13.3
Ethiopia	98.942	\$1,201	117.9	1.2	0.000%	152.0	1.5	178.1
Fiji	0.893	\$4,697	2.7	3.0	0.002%	3.2	3.6	3.2
Finland	5.461	\$31,107	59.6	10.9	0.339%	-26.0	-4.8	-27.1
France	64.983	\$30,644	497.6	7.7	3.270%	-364.3	-5.6	-388.2
Gabon	1.751	\$16,375	7.7	4.4	0.026%	1.2	0.7	1.7
Gambia, The	1.970	\$1,537	2.2	1.1	0.000%	3.1	1.6	3.3
Georgia	4.305	\$5,901	14.7	3.4	0.007%	17.6	4.1	17.1
Germany	82.562	\$35,879	965.7	11.7	5.249%	-388.1	-4.7	-401.9
Ghana	26.984	\$1,896	49.5	1.8	0.002%	59.7	2.2	79.4
Greece	11.126	\$20,644	107.4	9.7	0.391%	11.9	1.1	10.2
Grenada	0.107	\$9,494	0.4	3.3	0.001%	0.4	3.4	0.4
Guatemala	16.255	\$4,556	24.0	1.5	0.025%	23.4	1.4	44.3
Guinea	12.348	\$874	52.2	4.2	0.000%	59.8	4.8	66.5
Guinea-Bissau	1.788	\$1,009	2.8	1.5	0.000%	3.5	1.9	4.3
Guyana	0.808	\$3,607	6.1	7.6	0.002%	6.7	8.2	19.8
Haiti	10.604	\$1,128	8.6	0.8	0.001%	11.3	1.1	12.1
Honduras	8.424	\$3,860	17.8	2.1	0.012%	19.3	2.3	21.3
Hungary	9.911	\$18,391	64.8	6.5	0.195%	18.5	1.9	17.3
Iceland	0.337	\$35,111	5.0	14.9	0.021%	0.9	2.7	0.9
India	1282.390	\$4,087	3495.9	2.7	0.412%	6191.2	4.8	6158.8
Indonesia	255.709	\$4,811	879.4	3.4	0.279%	1304.3	5.1	1994.7
Iran	79.476	\$10,115	756.3	9.5	0.687%	719.8	9.1	728.9
Iraq	35.767	\$6,105	154.0	4.3	0.106%	243.4	6.8	241.7
Ireland	4.727	\$37,584	61.6	13.0	0.328%	-19.7	-4.2	-20.8
Israel	7.920	\$31,656	90.1	11.4	0.355%	12.7	1.6	11.2
Italy	61.142	\$25,872	444.3	7.3	2.574%	-232.8	-3.8	-248.1
Jamaica	2.813	\$6,685	9.2	3.3	0.014%	8.7	3.1	9.4
Japan	126.818	\$31,939	1365.8	10.8	7.416%	-609.5	-4.8	-634.6
Jordan	7.690	\$4,697	26.8	3.5	0.010%	37.5	4.9	37.8
Kazakhstan	16.770	\$13,528	423.2	25.2	0.343%	531.0	31.7	530.3
Kenya	46.749	\$1,664	56.9	1.2	0.017%	77.5	1.7	83.4
Kiribati	0.106	\$2,240	0.0	0.4	0.000%	0.1	0.6	0.1
Korea, Dem. Rep.	25.155	\$4,704	103.9	4.1	0.019%	131.5	5.2	130.0
Korea, Rep.	49.750	\$30,852	716.4	14.4	1.944%	403.8	8.1	399.4
Kuwait	3.583	\$40,591	111.5	31.1	0.291%	52.8	14.7	52.4
Kyrgyzstan	5.708	\$2,343	13.6	2.4	0.001%	20.0	3.5	19.9
Laos	7.020	\$2,976	26.9	3.8	0.001%	30.1	4.3	43.2
Latvia	2.031	\$17,317	11.6	5.7	0.032%	4.4	2.2	4.8

Lebanon	5.054	\$11,256	23.1	4.6	0.050%	14.7	2.9	14.6
Lesotho	2.120	\$1,760	2.0	0.9	0.001%	2.1	1.0	1.5
Liberia	4.503	\$569	2.9	0.6	0.000%	4.7	1.0	20.9
Libya	6.317	\$8,318	56.7	9.0	0.099%	52.8	8.4	52.8
Liechtenstein	0.037	\$142,431	0.3	7.9	0.006%	-1.3	-33.6	-1.3
Lithuania	2.999	\$20,614	22.8	7.6	0.063%	9.3	3.1	9.7
Luxembourg	0.543	\$69,423	12.4	22.8	0.083%	-8.8	-16.1	-9.1
Macedonia	2.109	\$10,394	13.7	6.5	0.015%	12.4	5.9	11.7
Madagascar	24.235	\$862	31.7	1.3	0.001%	37.0	1.5	64.0
Malawi	17.309	\$907	9.6	0.6	0.000%	14.0	0.8	28.5
Malaysia	30.651	\$16,419	290.4	9.5	0.458%	282.6	9.2	385.8
Maldives	0.358	\$8,791	0.9	2.5	0.001%	0.7	2.0	0.7
Mali	16.259	\$1,064	31.7	2.0	0.001%	47.2	2.9	53.5
Malta	0.431	\$24,914	3.4	7.8	0.012%	0.7	1.7	0.7
Marshall Islands	0.053	\$3,618	0.1	2.6	0.000%	0.2	3.8	0.2
Mauritania	4.080	\$2,330	11.4	2.8	0.001%	14.9	3.7	14.6
Mauritius	1.254	\$14,874	5.0	4.0	0.010%	3.1	2.5	3.0
Mexico	125.236	\$12,963	673.7	5.4	1.489%	479.9	3.8	512.5
Micronesia, Federated States of	0.104	\$4,070	0.1	1.0	0.000%	0.1	1.3	0.1
Moldova	3.437	\$3,460	9.7	2.8	0.002%	11.3	3.3	11.4
Monaco	0.038	\$149,883	0.1	2.6	0.006%	-1.5	-39.8	-1.6
Mongolia	2.923	\$5,669	24.0	8.2	0.004%	40.8	14.0	39.1
Montenegro	0.622	\$11,363	4.0	6.5	0.005%	3.8	6.2	3.8
Morocco	33.955	\$4,866	71.9	2.1	0.031%	86.2	2.5	90.0
Mozambique	27.122	\$1,036	16.2	0.6	0.000%	23.5	0.9	35.0
Myanmar	54.164	\$3,607	120.2	2.2	0.009%	130.0	2.4	255.8
Namibia	2.392	\$7,090	13.8	5.8	0.022%	10.9	4.5	11.3
Nauru	0.010	\$18,666	0.1	12.7	0.000%	0.1	8.6	0.1
Nepal	28.441	\$1,415	35.4	1.2	0.002%	50.8	1.8	93.0
Netherlands	16.844	\$37,039	191.0	11.3	1.131%	-94.1	-5.6	-97.6
New Zealand	4.596	\$25,853	79.4	17.3	0.256%	18.1	3.9	5.4
Nicaragua	6.257	\$3,976	15.3	2.4	0.008%	16.7	2.7	42.0
Niger	19.268	\$699	11.4	0.6	0.000%	16.6	0.9	19.4
Nigeria	183.523	\$2,876	219.3	1.2	0.047%	266.0	1.4	378.2
Niue	0.001	\$24,672	0.1	81.1	0.000%	1.3	1014.3	1.3
Norway	5.143	\$48,762	57.3	11.1	0.535%	-73.0	-14.2	-76.6
Oman	4.158	\$20,862	87.7	21.1	0.130%	74.1	17.8	74.0
Pakistan	188.144	\$2,686	367.9	2.0	0.008%	515.0	2.7	523.6
Palau	0.021	\$17,143	0.5	22.4	0.000%	5.2	242.0	5.2
Palestine	4.549	\$3,948	2.7	0.6	0.001%	3.8	0.8	3.7
Panama	3.988	\$15,998	16.1	4.0	0.041%	10.7	2.7	21.3
Papua New Guinea	7.632	\$3,130	7.8	1.0	0.004%	8.4	1.1	48.6
Paraguay	7.033	\$6,098	32.7	4.7	0.032%	29.9	4.3	45.9
Peru	31.161	\$10,162	111.9	3.6	0.150%	174.6	5.6	226.3
Philippines	101.803	\$4,393	169.6	1.7	0.101%	212.0	2.1	242.9
Poland	38.222	\$20,039	420.2	11.0	0.896%	264.8	6.9	262.1
Portugal	10.610	\$20,870	68.1	6.4	0.288%	-6.2	-0.6	-9.5
Qatar	2.351	\$87,013	150.4	64.0	0.349%	95.2	40.5	94.2
Romania	21.579	\$12,468	124.2	5.8	0.215%	83.3	3.9	82.9
Russia	142.098	\$15,337	2140.7	15.1	4.089%	882.6	6.2	911.9
Rwanda	12.428	\$1,250	5.7	0.5	0.000%	7.6	0.6	12.7
Saint Kitts and Nevis	0.055	\$17,483	0.3	5.9	0.001%	0.2	3.4	0.2
Saint Lucia	0.185	\$9,168	0.5	2.6	0.001%	0.4	1.9	0.4
Saint Vincent and the Grenadines	0.109	\$10,735	0.3	2.5	0.001%	0.2	1.9	0.2
Samoa	0.193	\$3,910	0.4	1.8	0.000%	0.3	1.8	0.3
San Marino	0.032	\$51,565	0.3	8.1	0.002%	-0.2	-7.8	-0.3
Sao Tome and Principe	0.203	\$1,726	0.2	0.9	0.000%	0.3	1.6	0.3
Saudi Arabia	29.898	\$27,048	642.3	21.5	1.286%	549.1	18.4	549.6
Senegal	14.967	\$1,732	25.9	1.7	0.001%	40.8	2.7	42.6

Serbia	9.424	\$7,191	59.3	6.3	0.044%	60.3	6.4	48.9
Seychelles	0.094	\$24,748	0.8	8.9	0.002%	0.5	5.2	0.5
Sierra Leone	6.319	\$1,260	6.0	0.9	0.000%	8.3	1.3	13.4
Singapore	5.619	\$56,635	22.0	3.9	0.335%	-56.5	-10.1	-58.5
Slovakia	5.458	\$22,591	44.3	8.1	0.142%	12.1	2.2	11.7
Slovenia	2.079	\$24,957	19.2	9.2	0.070%	2.0	1.0	1.8
Solomon Islands	0.584	\$1,775	4.6	7.9	0.000%	6.1	10.4	6.1
Somalia	11.123	\$788	22.4	2.0	0.000%	26.2	2.4	26.2
South Africa	53.491	\$9,898	571.4	10.7	0.829%	496.1	9.3	498.7
Spain	47.199	\$26,601	341.8	7.2	1.772%	-111.6	-2.4	-118.2
Sri Lanka	21.612	\$6,211	29.0	1.3	0.026%	24.7	1.1	31.5
Sudan	39.613	\$2,421	201.9	5.1	0.021%	226.4	5.7	243.8
Suriname	0.548	\$8,317	3.4	6.3	0.003%	3.6	6.6	3.6
Swaziland	1.286	\$4,713	3.0	2.4	0.003%	2.6	2.0	1.6
Sweden	9.694	\$36,454	59.1	6.1	0.579%	-97.6	-10.1	-101.0
Switzerland	8.239	\$40,207	56.2	6.8	0.634%	-101.9	-12.4	-106.0
Syria	22.265	\$5,153	87.6	3.9	0.035%	107.6	4.8	107.0
Taiwan	23.268	\$21,520	274.7	11.8	0.688%	102.8	4.4	100.5
Tajikistan	8.610	\$2,112	10.8	1.3	0.001%	13.2	1.5	12.7
Tanzania	52.291	\$1,510	50.8	1.0	0.001%	62.0	1.2	72.3
Thailand	67.401	\$9,012	470.3	7.0	0.397%	510.9	7.6	521.6
Timor-Leste	1.173	\$3,247	1.2	1.0	0.000%	1.3	1.1	1.3
Togo	7.171	\$981	10.5	1.5	0.000%	13.9	1.9	21.8
Tonga	0.106	\$4,536	0.3	2.6	0.000%	0.3	3.0	0.3
Trinidad and Tobago	1.347	\$22,944	65.8	48.8	0.086%	64.8	48.1	65.1
Tunisia	11.235	\$8,826	39.0	3.5	0.040%	40.2	3.6	41.7
Turkey	76.691	\$14,582	502.1	6.5	0.936%	437.8	5.7	434.5
Turkmenistan	5.373	\$13,277	91.1	17.0	0.047%	107.0	19.9	106.6
Tuvalu	0.010	\$6,906	0.0	4.2	0.000%	0.0	3.5	0.0
Uganda	40.141	\$1,197	42.1	1.0	0.001%	52.8	1.3	70.0
Ukraine	44.646	\$6,590	386.4	8.7	0.299%	382.7	8.6	385.2
United Arab Emirates	9.577	\$39,483	218.5	22.8	0.611%	113.7	11.9	112.1
United Kingdom	63.844	\$34,309	605.0	9.5	3.478%	-314.2	-4.9	-327.0
United States	325.128	\$45,264	6737.7	20.7	30.210%	-1039.9	-3.2	-1145.5
Uruguay	3.430	\$15,160	36.3	10.6	0.066%	24.6	7.2	16.3
Uzbekistan	29.710	\$3,812	180.8	6.1	0.018%	230.0	7.7	232.1
Vanuatu	0.264	\$3,834	0.4	1.7	0.000%	0.4	1.6	0.4
Venezuela	31.293	\$10,066	253.4	8.1	0.475%	146.8	4.7	180.2
Vietnam	93.387	\$3,532	350.2	3.7	0.018%	570.9	6.1	601.1
Yemen	25.535	\$2,150	37.8	1.5	0.002%	63.4	2.5	64.8
Zambia	15.520	\$1,599	18.2	1.2	0.010%	19.6	1.3	108.0
Zimbabwe	15.046	\$1,987	23.8	1.6	0.027%	23.8	1.6	37.3
World	7296.048	\$10,849	48984.405	6.7	100.0%	35695.0	4.9	37741.0

<http://gdrights.org/calculator/> Calculator version 3.0.0 Data version 6.8.2s 25 August 2015
(accessed online 1 September 2015)

Table 2: CERP allocations, by sets of country groups (n= 4 sets)

country grouping	Year 2015		CERP allocations					
	population (m)	per capita GDP	gross GHG	pc gGHG	RCI 2015	gGHG, 2030	pc gGHG, 2030	net GHG, 2030
Annex 1	1312.667	\$30,495	17352.7	13.2	73.0%	-1242.4	-0.9	-1464.2
Annex 2	934.192	\$36,784	13291.5	14.2	65.3%	-3482.8	-3.7	-3725.8
Non-Annex 1	5983.381	\$6,539	31631.7	5.3	27.0%	36937.4	6.2	39205.2
OECD	1250.344	\$31,979	15846.5	12.7	71.4%	-1832.5	-1.5	-2055.2
Non-OECD	6045.704	\$6,479	33137.9	5.5	28.6%	37527.5	6.2	39796.2
High Income	1278.964	\$32,910	18386.7	14.4	77.1%	-925.7	-0.7	-1158.0
Upper Middle Income	661.636	\$13,575	6615.1	10.0	11.2%	4546.4	6.9	4781.7
Lower Middle Income	3951.565	\$6,962	23312.7	5.9	16.2%	29065.3	7.4	30297.5
Low Income	1578.859	\$2,097	3107.7	2.0	0.2%	4107.0	2.6	4942.0
EITs	406.774	\$12,963	4504.2	11.1	7.3%	2926.2	7.2	2937.5
LDCs	862.254	\$1,757	1577.8	1.8	0.1%	2018.9	2.3	2592.1
EU 15	404.138	\$31,342	3662.9	9.1	21.1%	-1819.2	-4.5	-1912.6
JPAUNZ	155.338	\$32,494	2012.8	13.0	9.8%	-534.5	-3.4	-575.2
World	7296.048	\$10,849	48984.4	6.7	100.0%	35695.0	4.9	37741.0

Table3: CERP allocations, by country group (n=9)

country grouping	Year 2015		CERP allocations					
	population (m)	per capita GDP	gross GHG	pc gGHG	RCI 2015	gGHG, 2030	pc gGHG, 2030	net GHG, 2030
North America: USA & Canada	360.999	\$44,474	7497.1	20.8	33.2%	-955.2	-2.6	-1056.5
EU	417.932	\$31,755	3781.9	9.0	22.3%	-1996.0	-4.8	-2097.0
other established economies (JpAuNZ)	155.338	\$32,494	2012.8	13.0	9.8%	-534.5	-3.4	-575.2
former Soviet bloc, plus Turkey	382.219	\$14,874	4099.6	10.7	7.7%	2289.1	6.0	2308.5
recent developed economies	117.734	\$32,730	2164.5	18.4	5.5%	1342.4	11.4	1333.3
developing economies	867.306	\$11,559	6212.8	7.2	10.0%	5015.8	5.8	5697.8
China	1401.587	\$9,143	14222.8	10.1	9.6%	17053.1	12.2	16993.1
India	1282.390	\$4,087	3495.9	2.7	0.4%	6191.2	4.8	6158.8
other least developed economies	2310.544	\$3,099	5496.8	2.4	1.5%	7289.1	3.2	8978.1
World	7296.048	\$10,849	48984.4	6.7	100.0%	35695.0	4.9	37741.0

key to columns:

1. country group name
2. population 2015 (millions)
3. per capita GDP 2015 (\$US-PPP)
4. total gross GHG emissions 2015 (MtCO_{2e})
5. per capita gross GHG emissions 2005 (tCO_{2e})
6. CERP framework RCI % of global gross GHG emissions 2015
(= country allocation gross emissions 2015 / world allocation gross emissions 2015) (%)
7. total CERP allocation for gross emissions for 2030 (MtCo_{2e})
8. per capita CERP allocation for gross emissions for 2030 (= allocation/population) (tCO_{2e})
9. total CERP allocation for net emissions for 2030 (MtCo_{2e})

<http://gdrights.org/calculator/> Calculator version 3.0.0 Data version 6.8.2s 25 August 2015
(accessed online 1 September 2015)