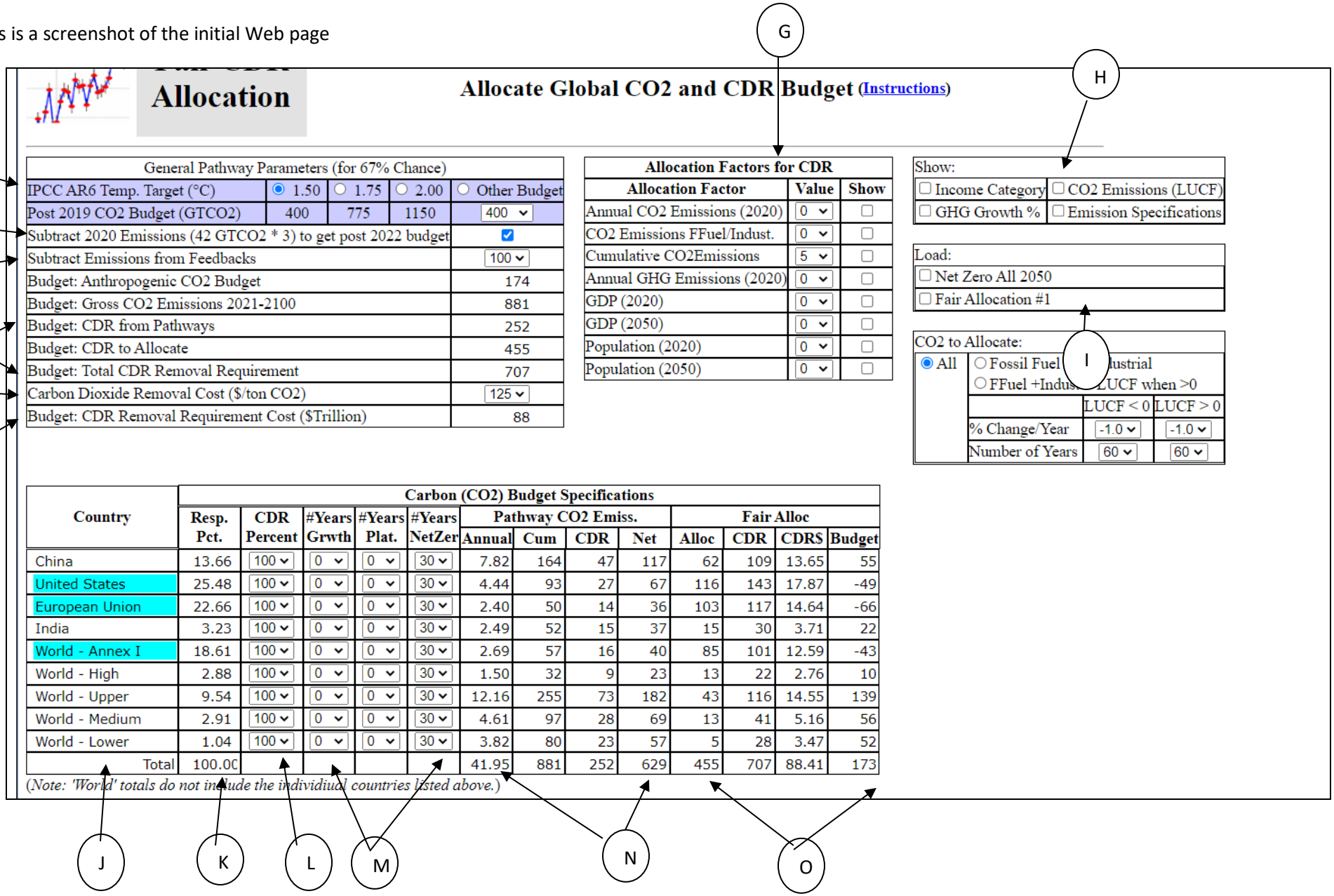
Fair Allocation Instructions (June 15, 2022)

This is a screenshot of the initial Web page



Allocation

Allocate Global CO2 and CDR Budget (Instructions)

General Pathway Parameters (for 67% Chance)				
IPCC AR6 Temp. Target (°C)	◉ 1.50	○ 1.75	○ 2.00	○ Other Budget
Post 2019 CO2 Budget (GTCO2)	400	775	1150	400
Subtract 2020 Emissions (42 GTCO2 * 3) to get post 2022 budget	☑			
Subtract Emissions from Feedbacks	100			
Budget: Anthropogenic CO2 Budget	174			
Budget: Gross CO2 Emissions 2021-2100	881			
Budget: CDR from Pathways	252			
Budget: CDR to Allocate	455			
Budget: Total CDR Removal Requirement	707			
Carbon Dioxide Removal Cost ($/ton CO2)	125			
Budget: CDR Removal Requirement Cost ($Trillion)	88			

Allocation Factors for CDR		
Allocation Factor	Value	Show
Annual CO2 Emissions (2020)	0	☐
CO2 Emissions FFuel/Indust.	0	☐
Cumulative CO2Emissions	5	☐
Annual GHG Emissions (2020)	0	☐
GDP (2020)	0	☐
GDP (2050)	0	☐
Population (2020)	0	☐
Population (2050)	0	☐

Show:
☐ Income Category ☐ CO2 Emissions (LUCF)
☐ GHG Growth % ☐ Emission Specifications

Load:
☐ Net Zero All 2050
☐ Fair Allocation #1

CO2 to Allocate:
◉ All ○ Fossil Fuel ○ FFuel +Indust. ○ LUCF when >0

	LUCF < 0	LUCF > 0
% Change/Year	-1.0	-1.0
Number of Years	60	60

Country	Carbon (CO2) Budget Specifications												
	Resp. Pct.	CDR Percent	#Years Grwth	#Years Plat.	#Years NetZer	Pathway CO2 Emiss. Annual	Cum	CDR	Net	Fair Alloc Alloc	CDR	CDRS	Budget
China	13.66	100	0	0	30	7.82	164	47	117	62	109	13.65	55
United States	25.48	100	0	0	30	4.44	93	27	67	116	143	17.87	-49
European Union	22.66	100	0	0	30	2.40	50	14	36	103	117	14.64	-66
India	3.23	100	0	0	30	2.49	52	15	37	15	30	3.71	22
World - Annex I	18.61	100	0	0	30	2.69	57	16	40	85	101	12.59	-43
World - High	2.88	100	0	0	30	1.50	32	9	23	13	22	2.76	10
World - Upper	9.54	100	0	0	30	12.16	255	73	182	43	116	14.55	139
World - Medium	2.91	100	0	0	30	4.61	97	28	69	13	41	5.16	56
World - Lower	1.04	100	0	0	30	3.82	80	23	57	5	28	3.47	52
Total	100.00					41.95	881	252	629	455	707	88.41	173

(Note: 'World' totals do not include the individual countries listed above.)

A. Select the CO2 budget based on either the desired temperature increase or from the “dropdown” list
B. If you are using the IPCC temperature targets, you can check this box to subtract the 2020 emissions from the IPCC post=2019 budget to get the post-2022 budget
C. The IPCC budget is for total CO2 emissions. Select a value for feedback emissions (permafrost, etc.) in the “dropdown” list so the post-2020 anthropogenic CO2 emissions budget can be calculated (D)
D. The system will calculate these three values
E. Select a value in the “dropdown” list so that the costs associated with CO2 removal can be calculated
F. The system will calculate this value
G. Speculations for calculating the responsibility percent (results displayed in “Resp. Pct.” (K))
    a. Click a box in the “Show” column to display the corresponding data. For example

Country	GHG Emis. (2020) (Per Capita in Tons)			CO2 Emis. (All-2020) (Per Capita in Tons)			GDP 2020		
	Amt.	Pct.	P. C.	Amt.	Pct.	P. C.	Amt.	Pct.	P. C.
China	13.57	26.10	9.40	7.816	18.63	5.41	14.9	17.82	10.0
United States	6.59	12.67	19.78	4.444	10.59	13.35	20.8	24.95	62.0
European Union	4.40	8.47	8.57	2.405	5.73	4.68	17.6	21.06	34.0
India	3.68	7.08	2.64	2.492	5.94	1.79	2.6	3.11	1.0
World - Annex I	7.40	14.23	13.59	2.695	6.42	4.95	13.0	15.63	23.0
World - High	2.19	4.21	15.28	1.504	3.59	10.51	3.0	3.54	20.0
World - Upper	7.15	13.76	5.90	12.158	28.98	10.03	7.2	8.60	5.0
World - Medium	4.50	8.66	2.83	4.612	10.99	2.9	3.3	4.01	2.0
World - Lower	2.51	4.84	3.63	3.823	9.11	5.52	1.1	1.27	1.0
Total	52	100	0	41.949	100	5.33	83.4	100	10.6

Table 2

    b. The “CO2 Emissions (All)” are for 2020 and include land-use and forestry (“LUCF”)

    c. The percent is calculated as the “weighted average” of the “checked” allocation factors. In the above screenshot, only “Cumulative CO2 Emissions” will be considered.

    d. If the values selected are as shown below, the system will calculate the percentage based on 30% of the “Annual CO2 Emissions”, 50% of the “Cumulative CO2 Emissions” and 20% of the “GDP”. (The calculation is as follows: (1) for each “group” calculate the “total percentage” as the

sum of each factor for the “group” (which is a percent of the global total) multiplied by the “Value”, (2)sum all of the “total percentages”, and (3) adjust each ”groups” “total percentage” so that they total 100%. E.g., for China, the “total percentage” calculation is 3 x 29.93 + 4 x 25.48 + 2 x 17.82))

Allocation Factors for CDR		
Allocation Factor	**Value**	**Show**
Annual CO2 Emissions (2020)	3	☐
CO2 Emissions FFuel/Indust.	0	☐
Cumulative CO2Emissions	5	☐
Annual GHG Emissions (2020)	0	☐
GDP (2020)	2	☐
GDP (2050)	0	☐
Population (2020)	0	☐
Population (2050)	0	☐

Table 3

H. Show – “check” a box to display the corresponding values
    a. “Emissions Specification” allow you to specify pathways for both “budgets” and “emissions”
I. Load
    a. Initialize the “budget pathways” to a pre-defined set of values
J. The world’s countries are divided into nine groups, with four of the groups based on the World Banks ”GNI” index of income levels:

    a. China
    b. United Sates
    c. European Union
    d. India
    e. Annex I countries (supposed to help other countries mitigate emissions)
    f. GNI Index
    g. Upper
    h. High
    i. Medium
    j. Lower
K. Responsibility Percent
    a. Calculated in “G” above

b. The “CDR to be allocated” is computed as “CDR Removal Requirement” (“D” above , where the value is 1,033) minus the “CDR CO2 Pathway Emissions” (“N” above, where the value is 221”) (Computation: 1,033 – 221 = 812)
c. The “CDR to be allocated” is multiplied to get each “groups” CDR allocation (displayed in the “O” “Alloc” column above)

L. CDR Percent
   a. Specifies the percentage of the CO2 removal for the “net zero pathway” that the “group” is responsible for. (India and “lower income countries” should not have to pay for CO2 removal)

M. Emissions pathway specifications
   a. Number of years of growth – less developed countries should be able to grow (e.g., India’s NDC call for 15 year of growth – see Appendix C)
   b. Number of years where emissions remain the same (“plateau”) (e.g., China’s NDC calls for 10 years of no emissions change – see Appendix B)
   c. Number years to net-zero- 30 years is a good estimate for all countries

N. Pathway CO2 Emissions
   a. Calculated based on values in “L” and “M” above
      i. “Annual”: emissions in the “net zero” year
      ii. “Cum”: cumulative emissions from 2020 to 2100 (or 2023-2100 if “box B” is checked)
      iii. “CDR”: CDR required for “net zero”
      iv. “Net”: “Cum” – “CDR”

O. Fair Allocation
   a. “Alloc” – a “groups” CDR allocation based on a groups “responsible percent” (see “K” above)
   b. “CDR” – the total CDR required for the group (“Alloc” + “CDR” in “Pathway CO2 Emissions” (“N” above)
   c. “CDR$” – estimate cost of CDR for the “group”
   d. “Budget” – The net amount of CO2 that the “group” can emit between 2020 and 2100.

https://www.statista.com/statistics/276629/global-co2-emissions/
2019 CO2 Emissions – Fossil Fuel and Industry = 36.44
Land use Change 6.6