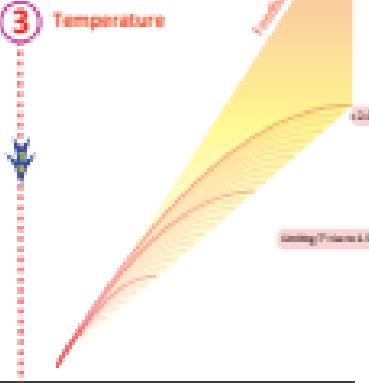
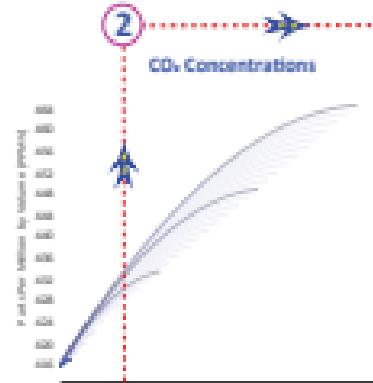


# Zero emissions globally 2030-2040 to avoid ecosystem collapse?

Temperature Feedbacks  
2.7°C 3.0°C 3.3°C 3.6°C 3.9°C 4.2°C 4.5°C 4.8°C 5.1°C 5.4°C 5.7°C 6.0°C  
... ecosystem collapse?

① cause → knock-on effects ② ③ ④



PPM	2.7°C	3.0°C	3.3°C	3.6°C	3.9°C	4.2°C	4.5°C	4.8°C	5.1°C	5.4°C	5.7°C	6.0°C
1,000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2,000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000
3,000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000
4,000	4.000	4.000	4.000	4.000	4.000	4.000	4.000	4.000	4.000	4.000	4.000	4.000
5,000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
6,000	6.000	6.000	6.000	6.000	6.000	6.000	6.000	6.000	6.000	6.000	6.000	6.000
7,000	7.000	7.000	7.000	7.000	7.000	7.000	7.000	7.000	7.000	7.000	7.000	7.000
8,000	8.000	8.000	8.000	8.000	8.000	8.000	8.000	8.000	8.000	8.000	8.000	8.000
9,000	9.000	9.000	9.000	9.000	9.000	9.000	9.000	9.000	9.000	9.000	9.000	9.000
10,000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000

Positive Feedbacks acceleration starts at 2.7°C
2.7°C
3.0°C
3.3°C
3.6°C
3.9°C
4.2°C
4.5°C
4.8°C
5.1°C
5.4°C
5.7°C
6.0°C

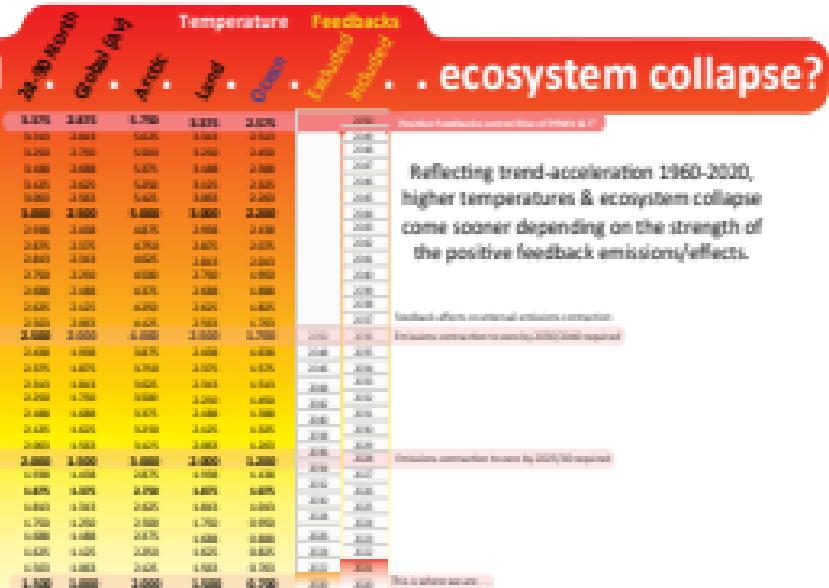
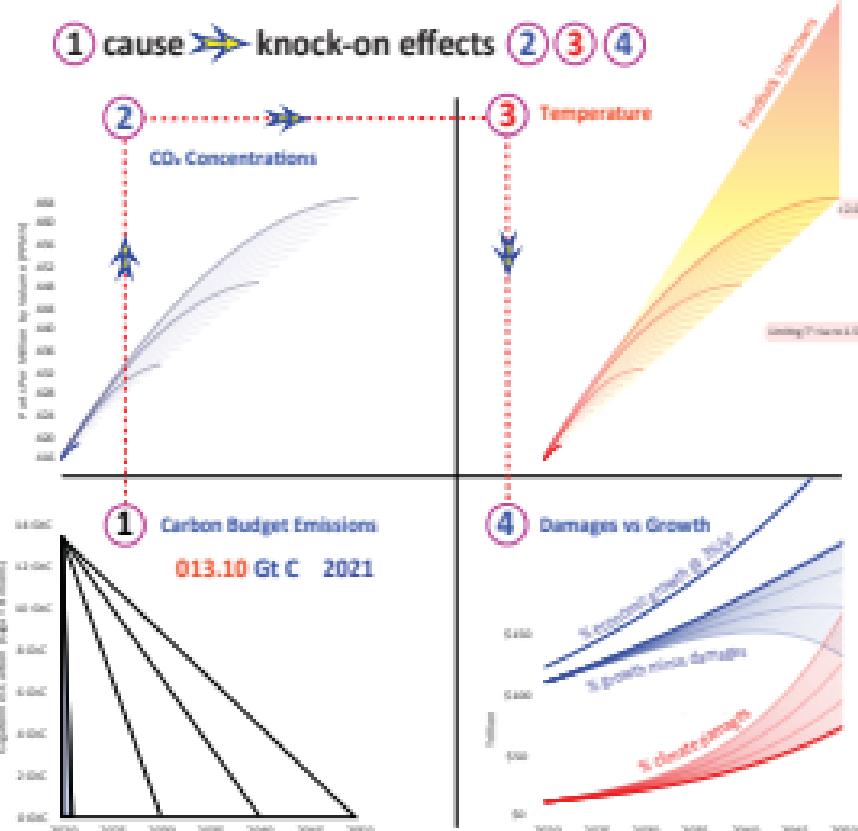
Feedback after external climate reduction  
Emissions contraction needed 2030/2040 required  
Emissions contraction needed by 2030/2040 required  
Emissions contraction needed by 2030/2040 required  
Feedback acceleration

Rising risks in this chain of causation . . .

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① cause → knock-on effects ② ③ ④

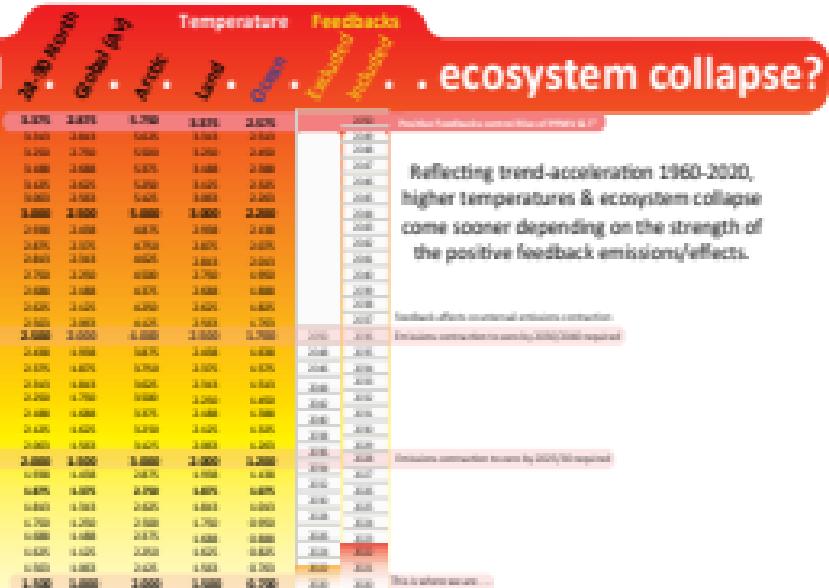
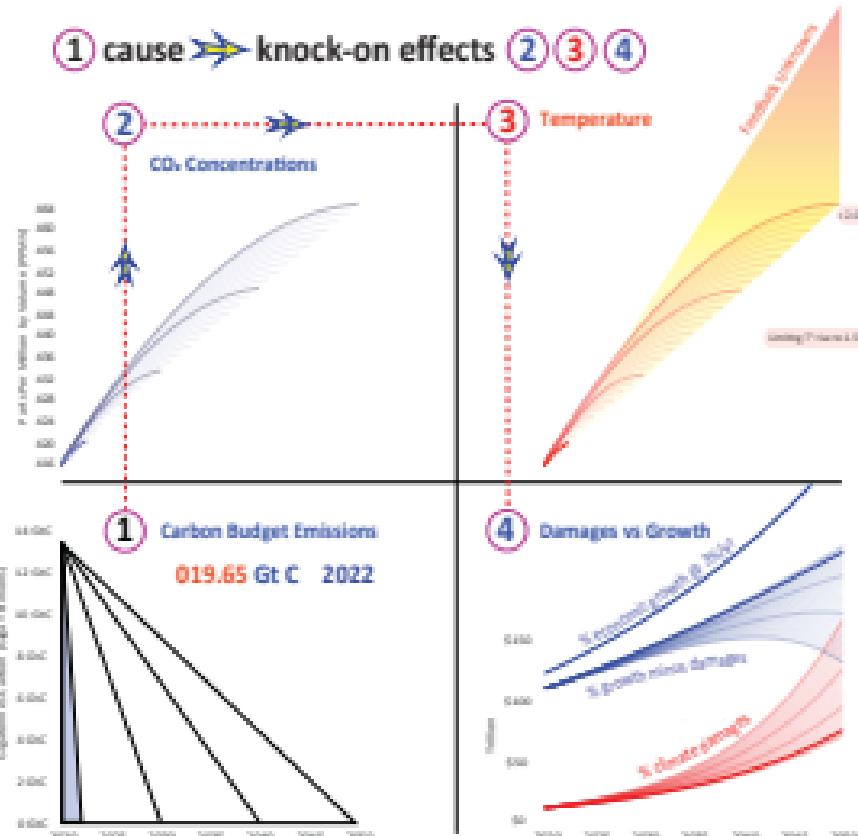


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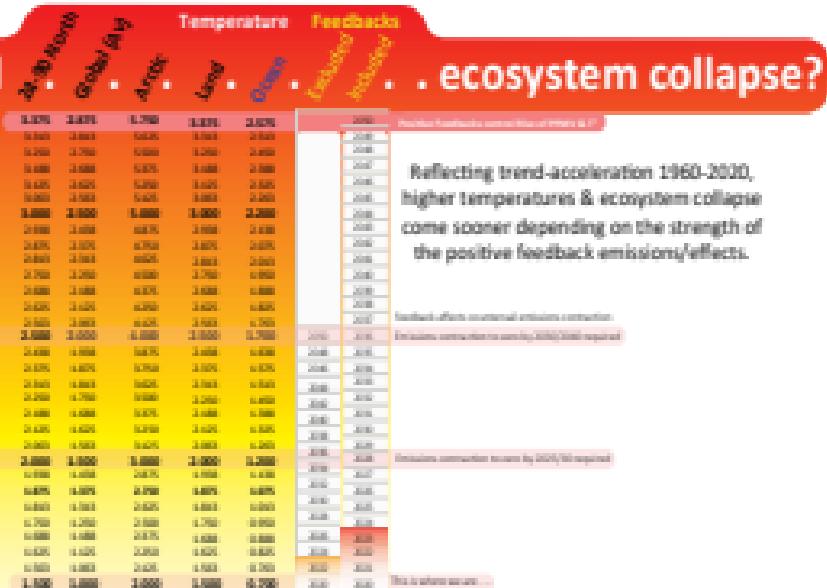
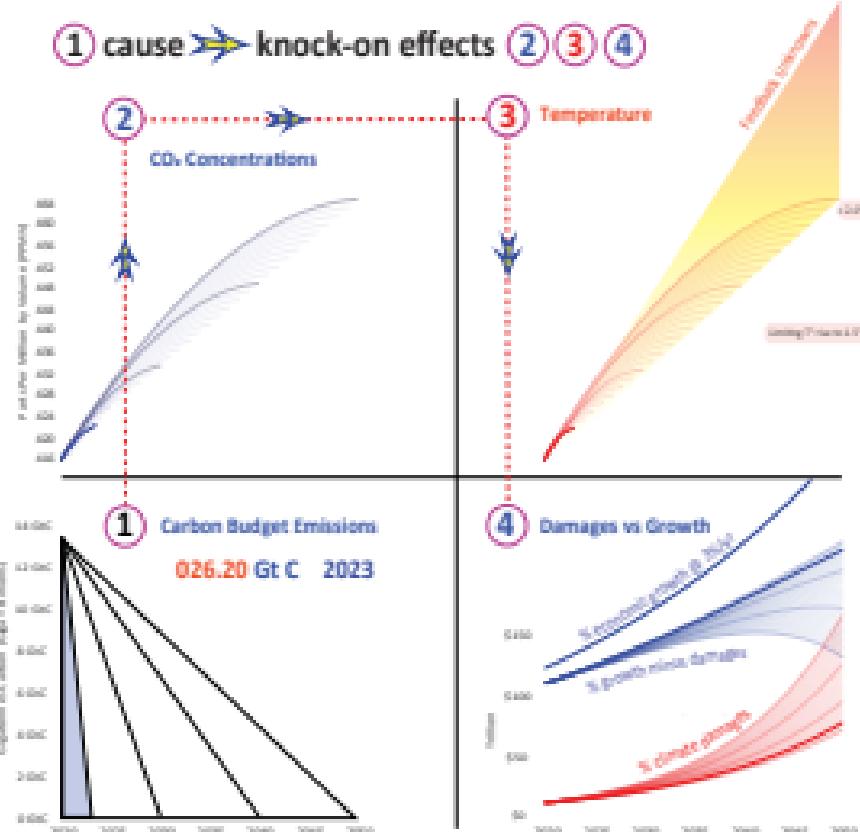


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① cause → knock-on effects ② ③ ④



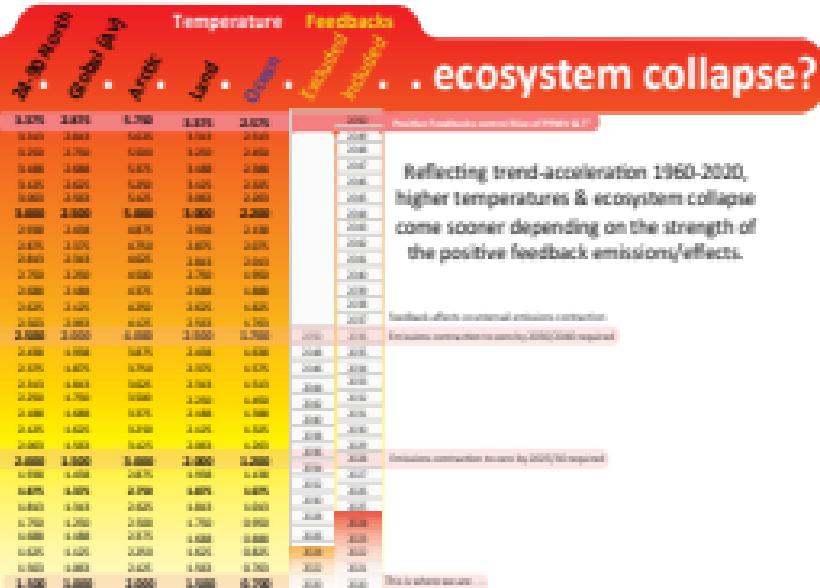
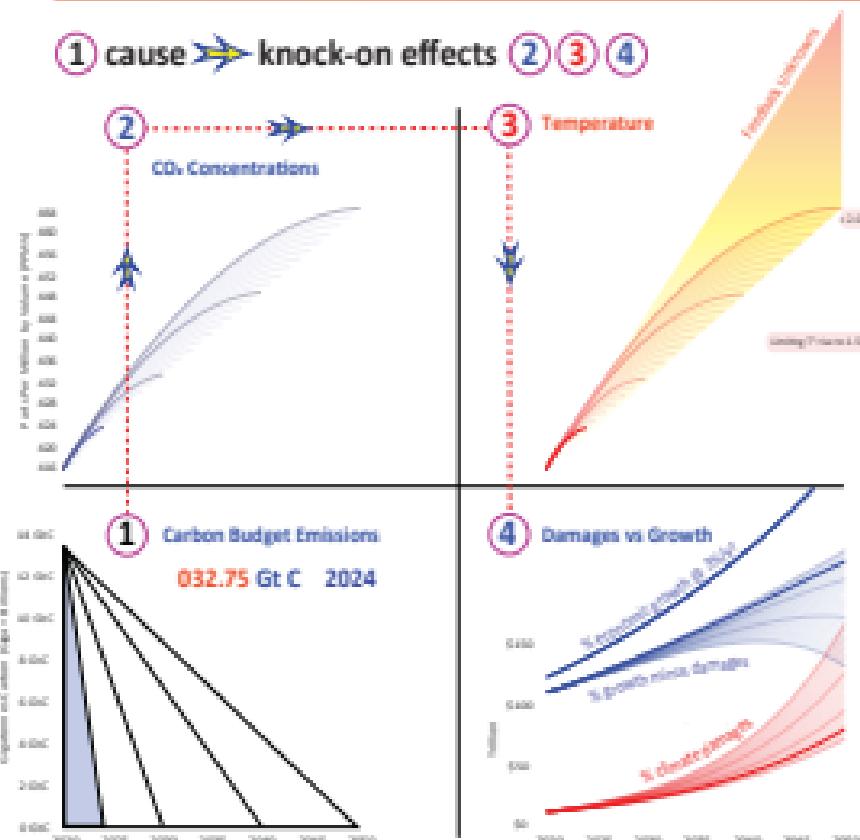
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Temperature Feedbacks

① cause → knock-on effects ② ③ ④



... ecosystem collapse?

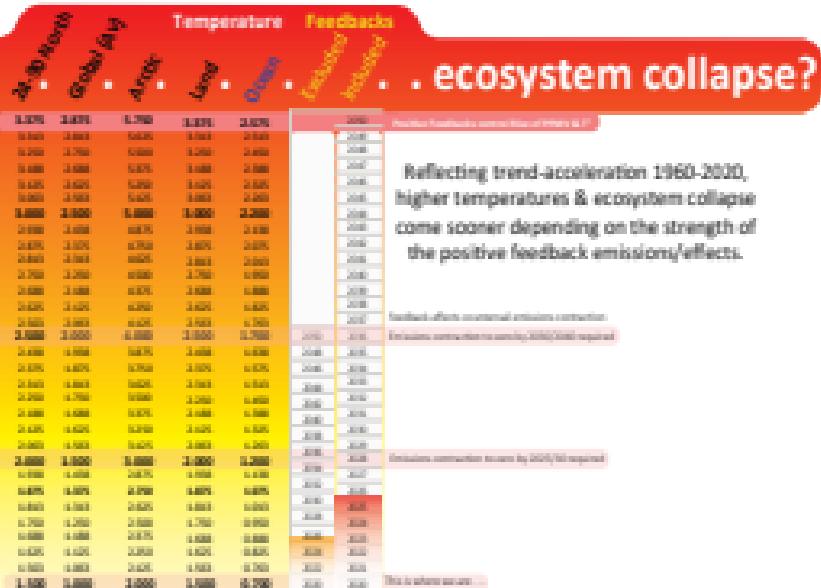
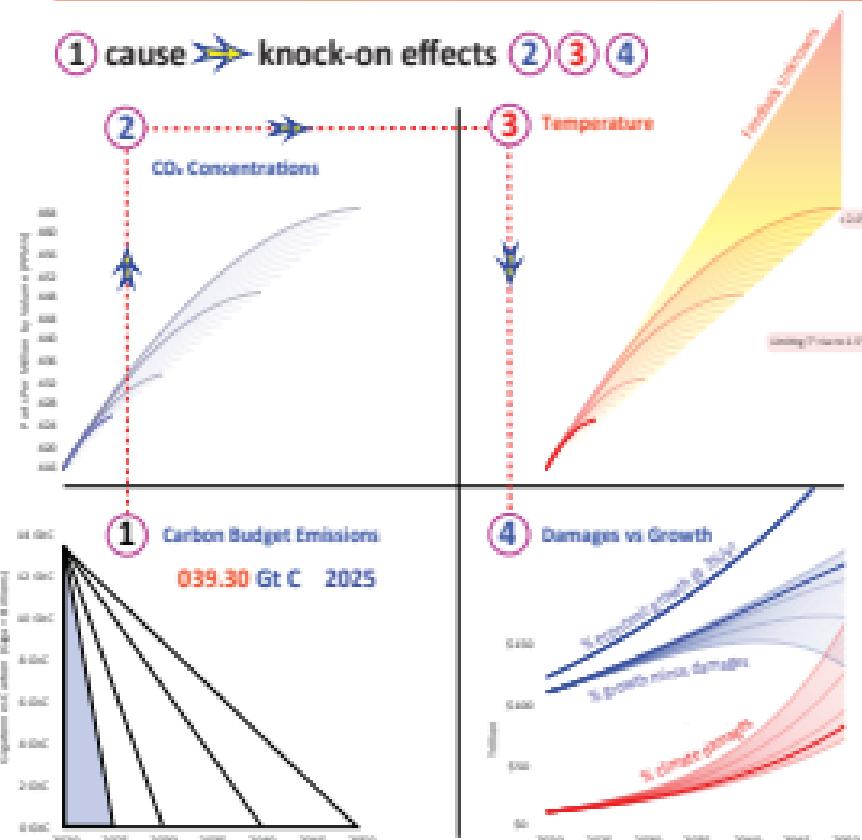
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Temperature Feedbacks

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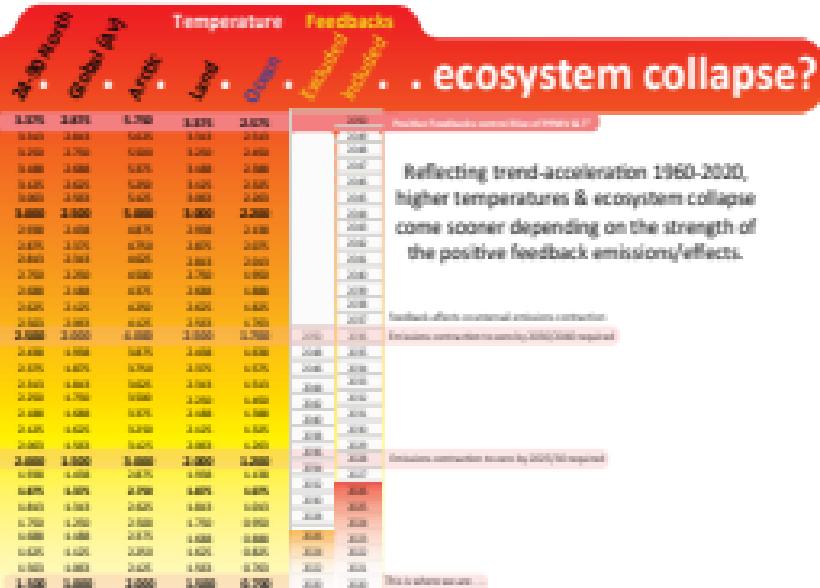
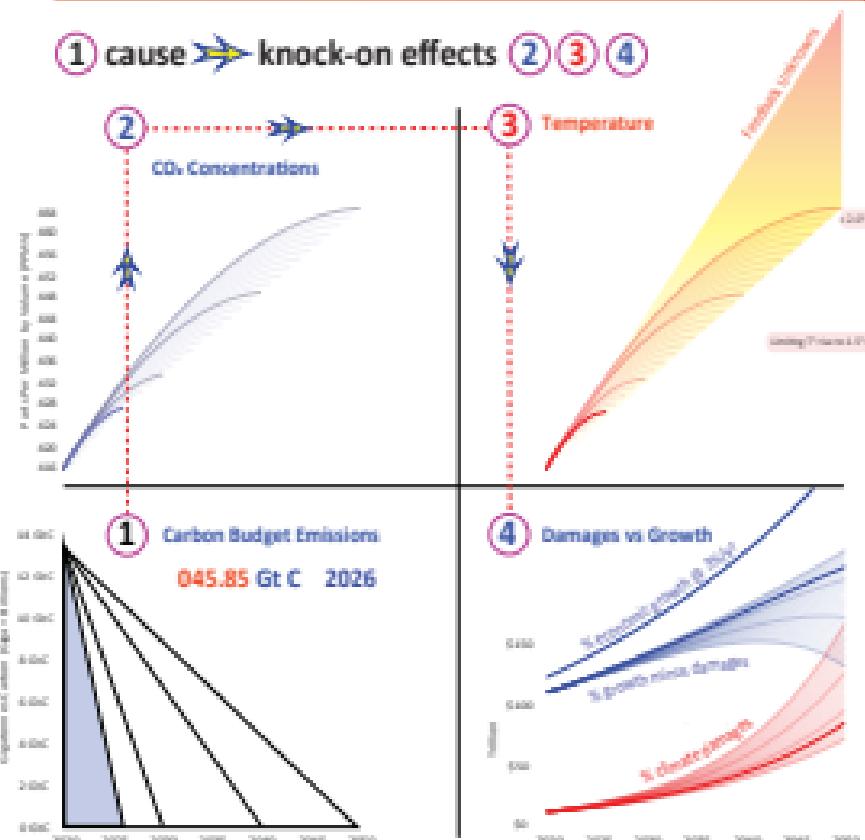
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Temperature Feedbacks

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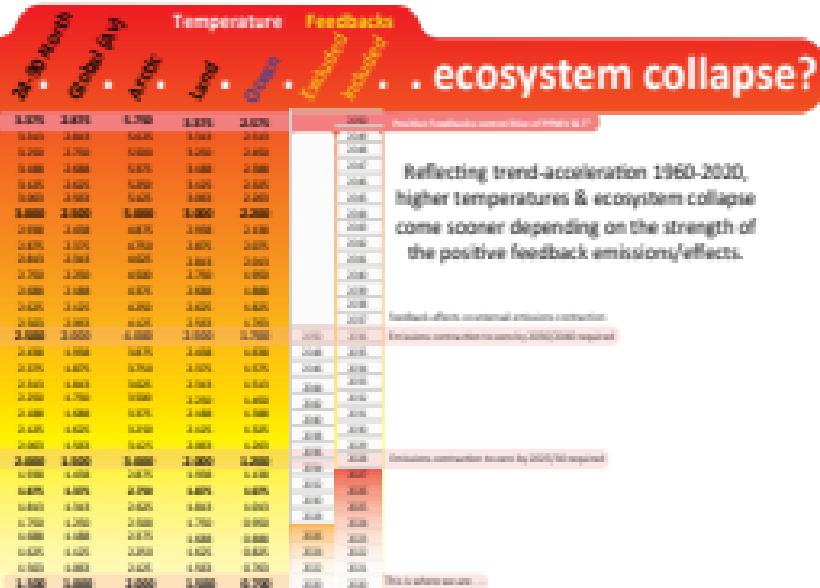
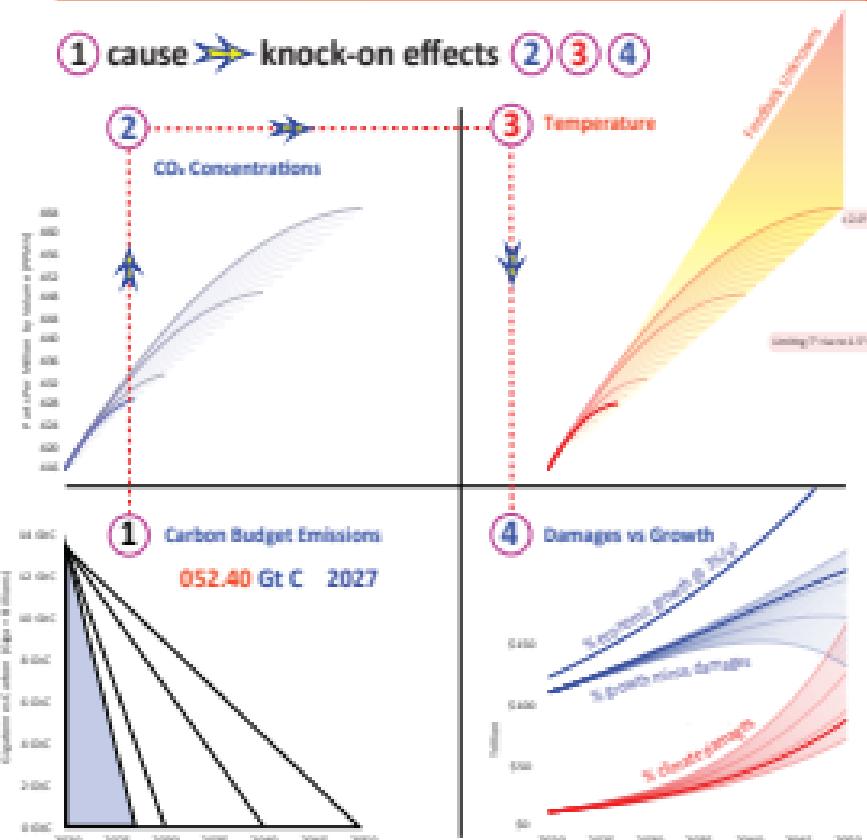
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Temperature Feedbacks

① cause → knock-on effects ② ③ ④



Rising risks in this chain of causation . . .

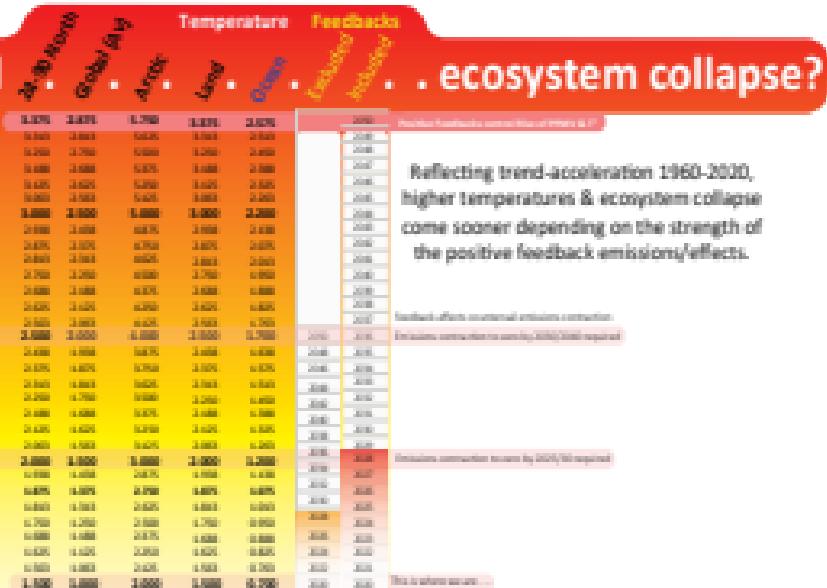
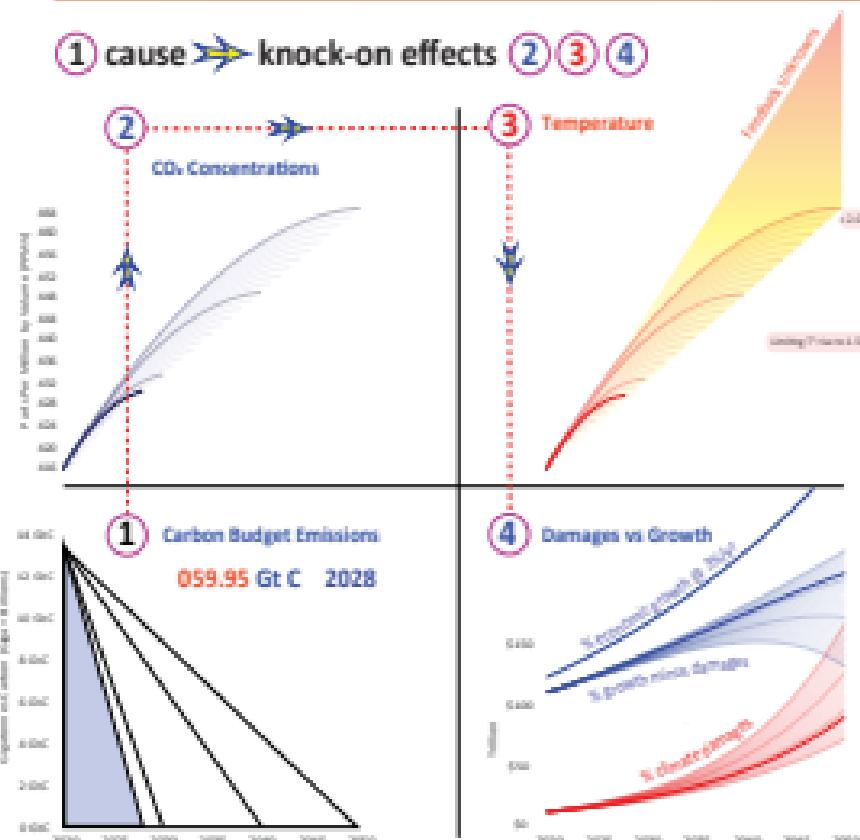
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Feedbacks

① cause ➔ knock-on effects ② ③ ④



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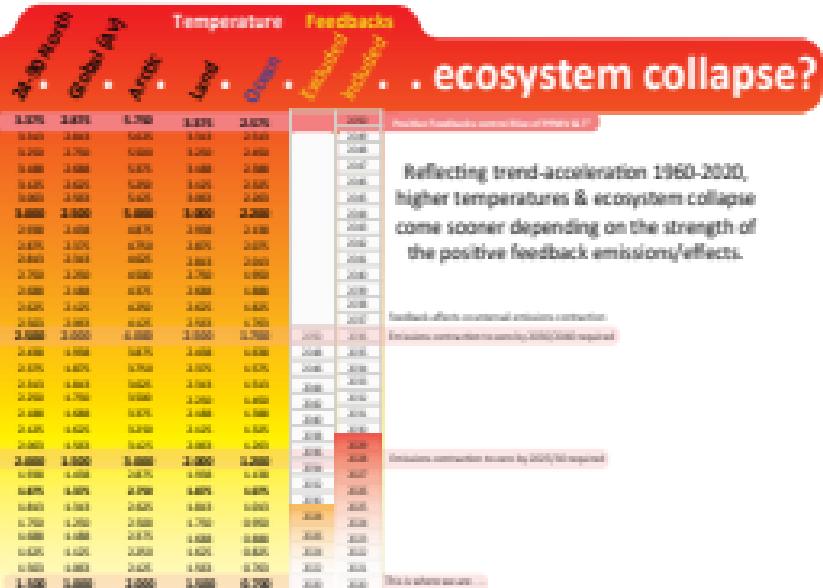
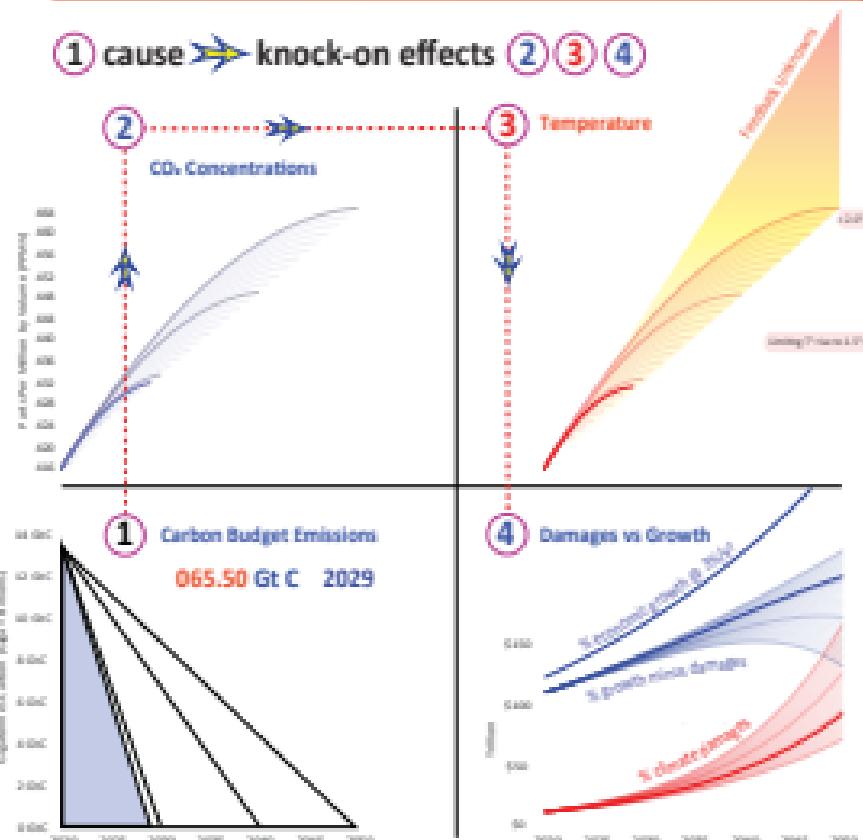
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Feedbacks

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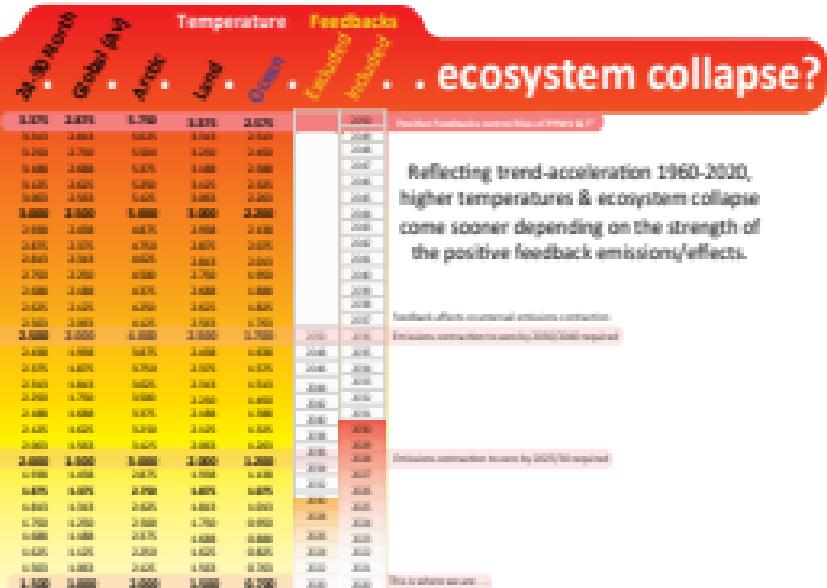
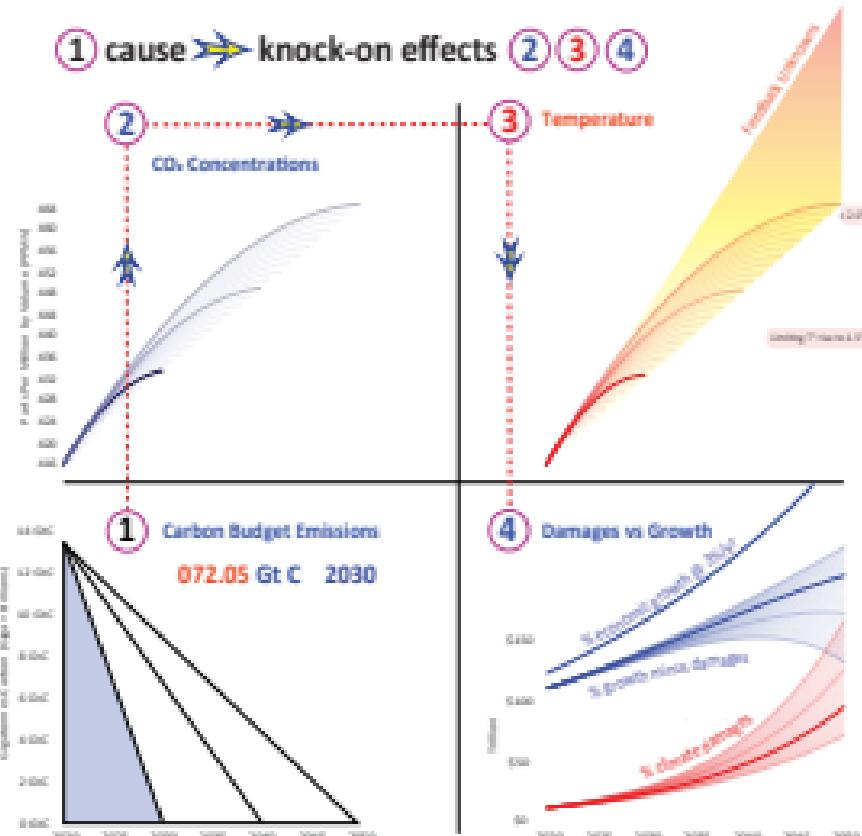


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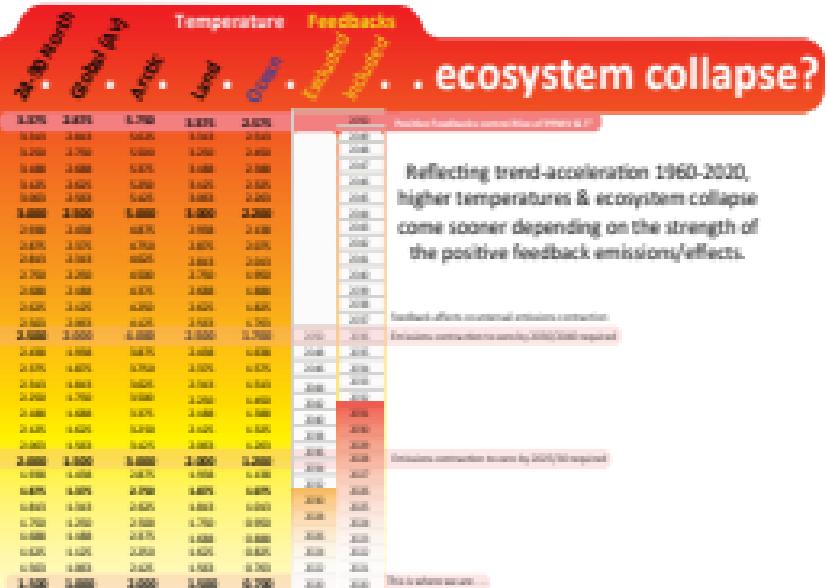
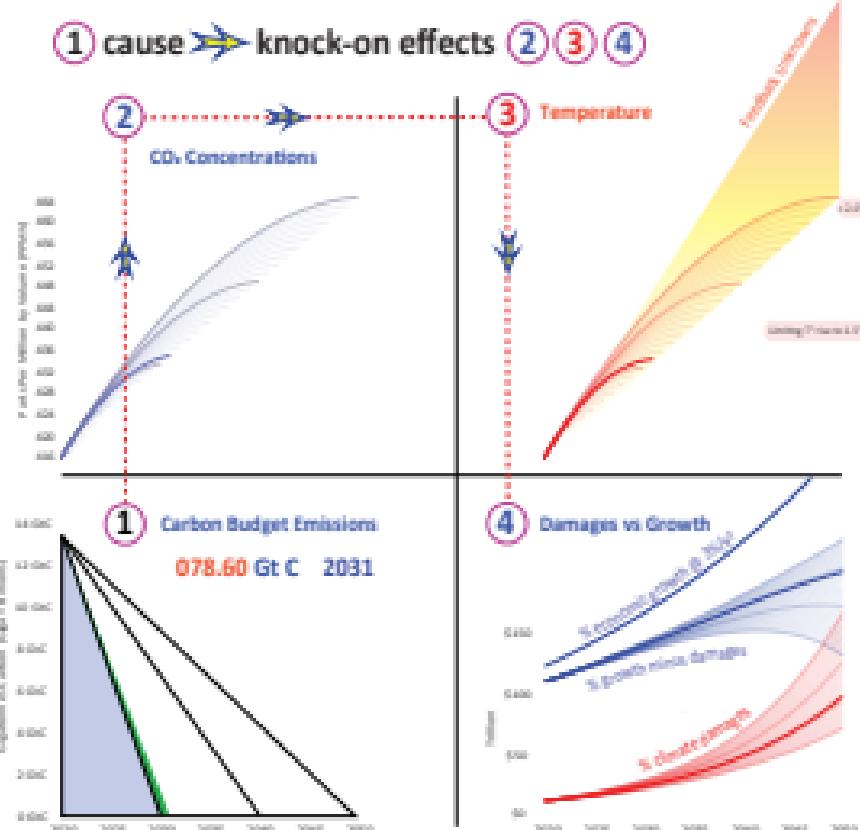


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① cause → knock-on effects ② ③ ④

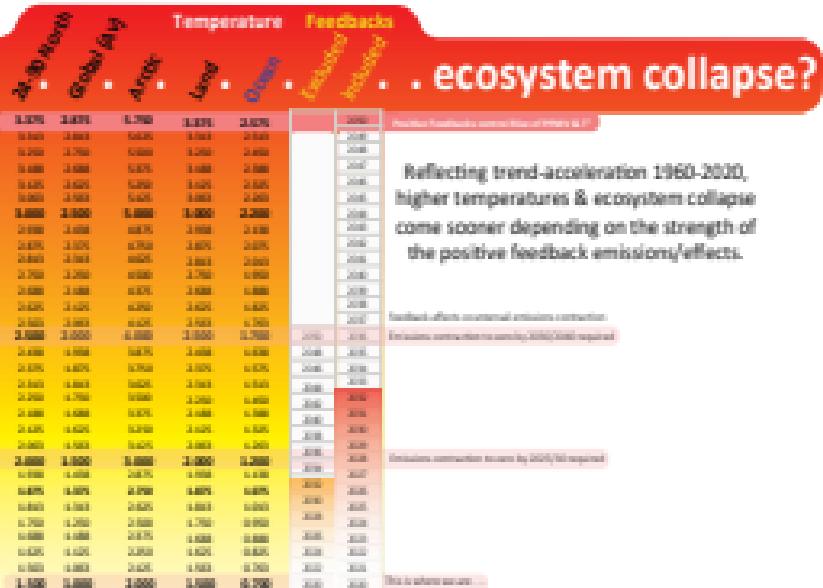
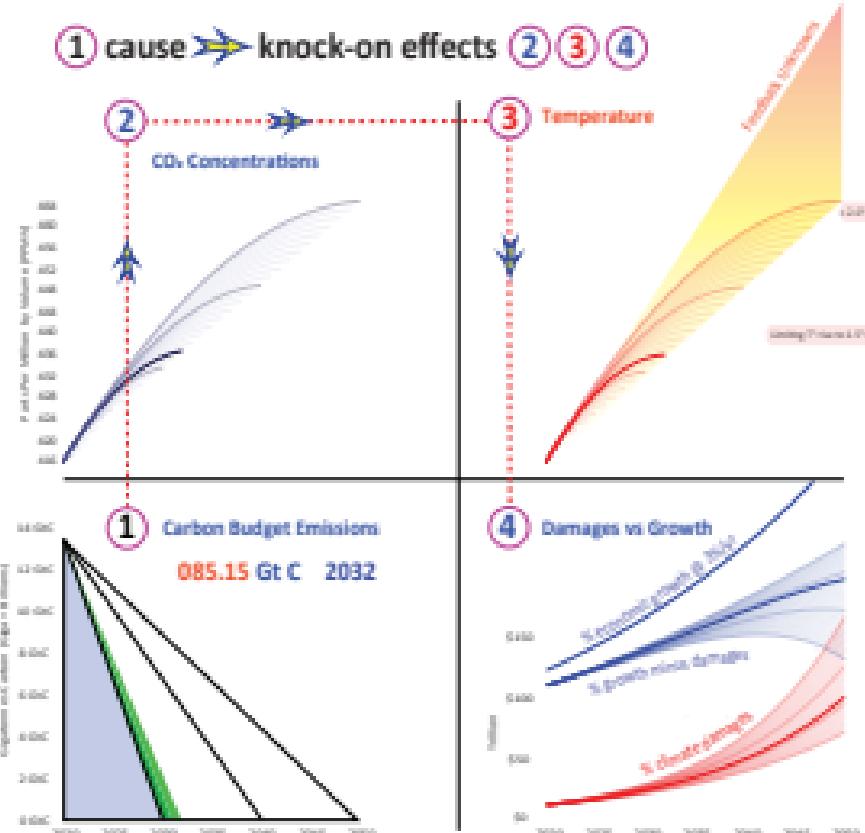


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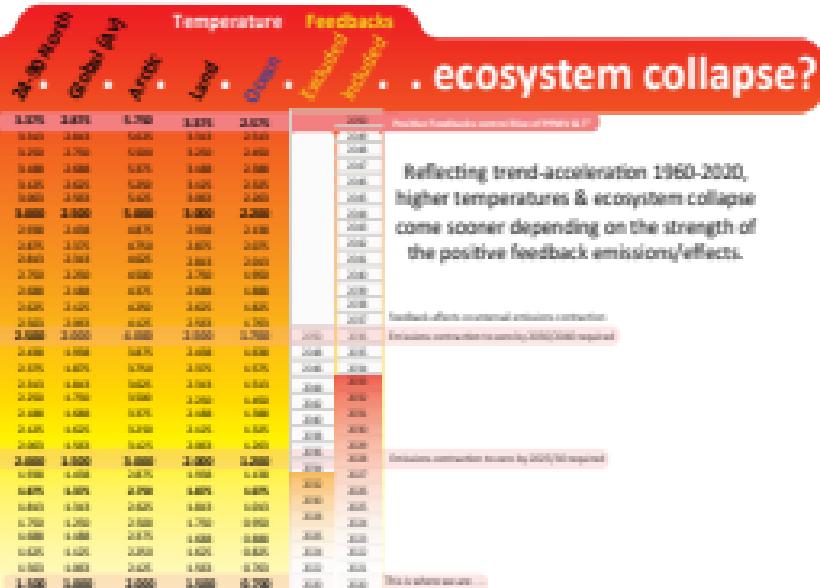
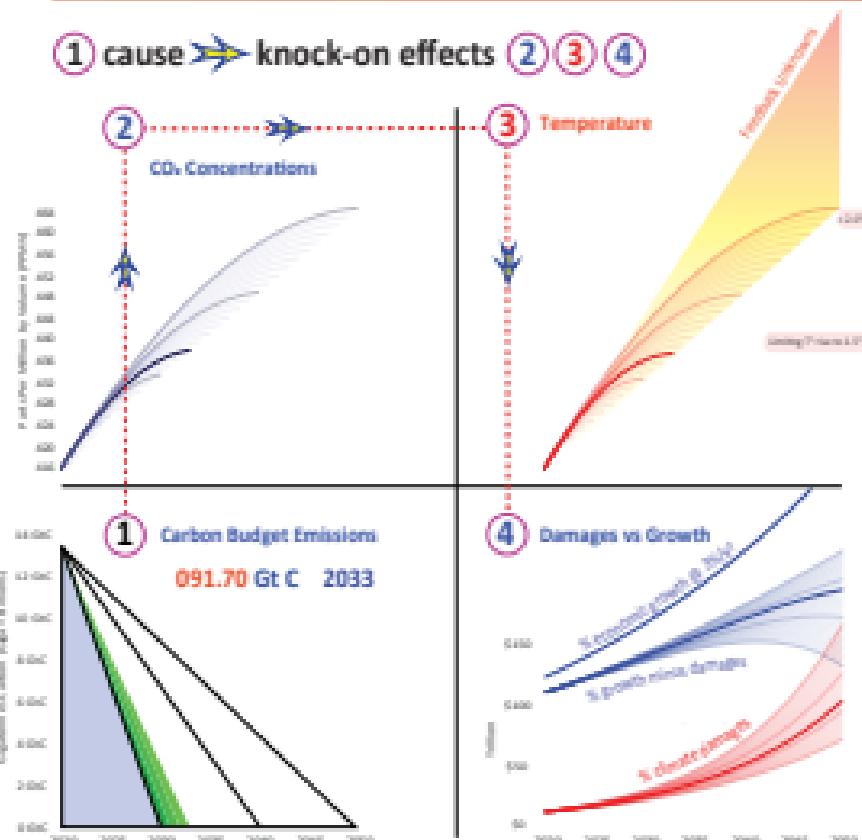
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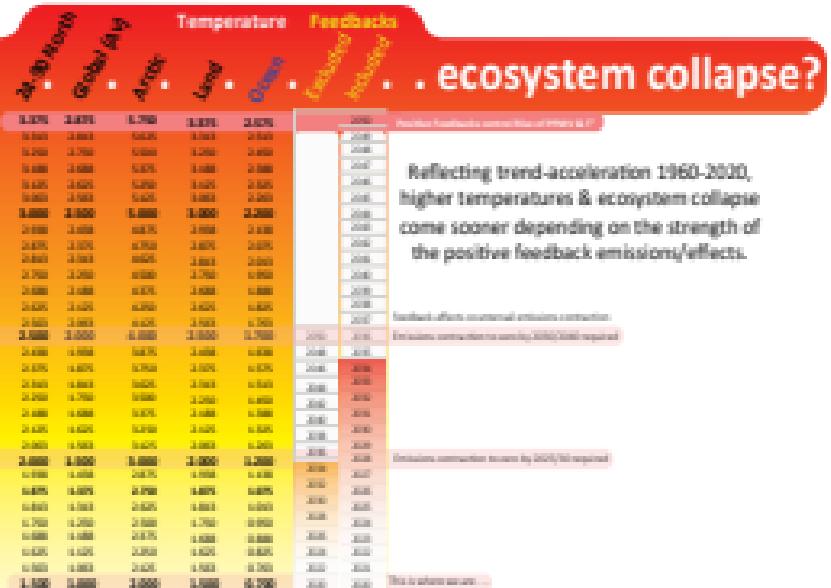
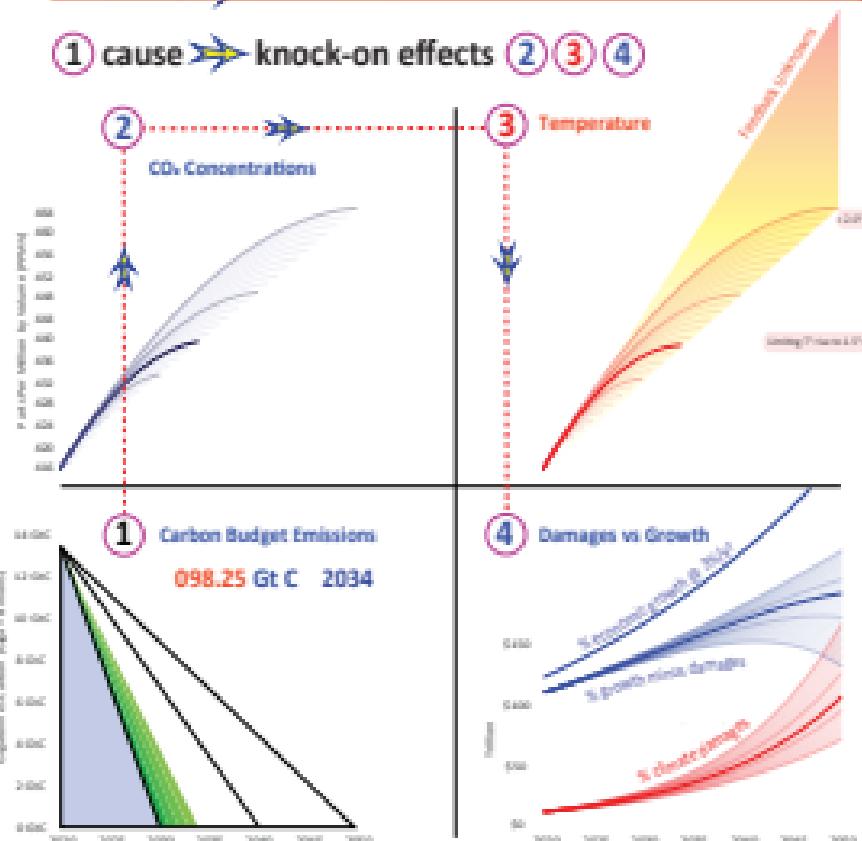
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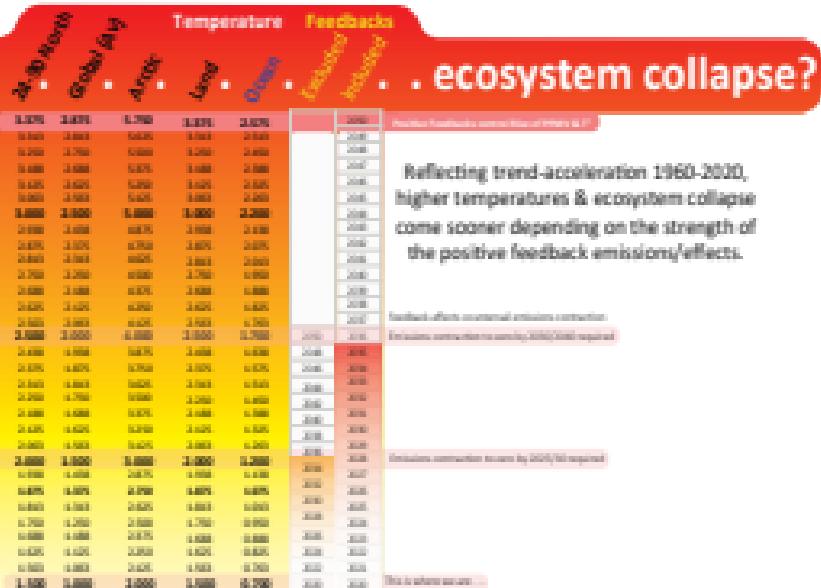
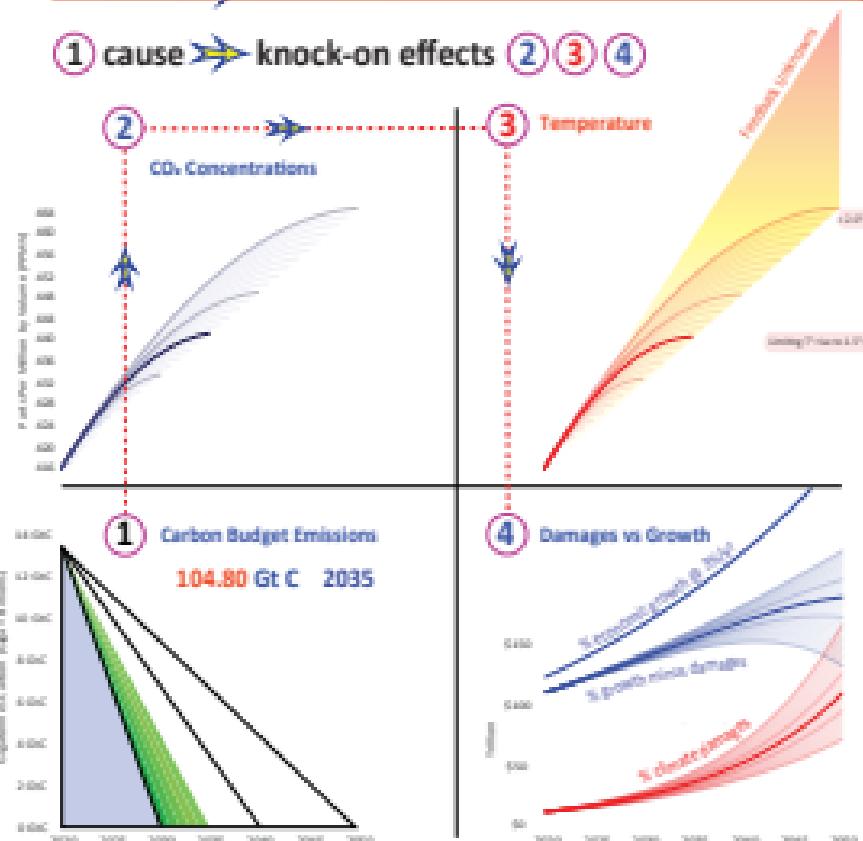
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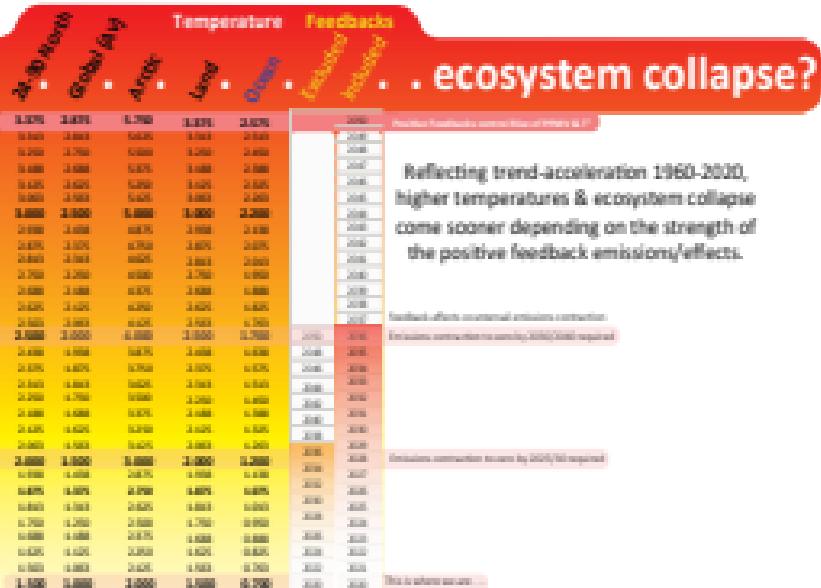
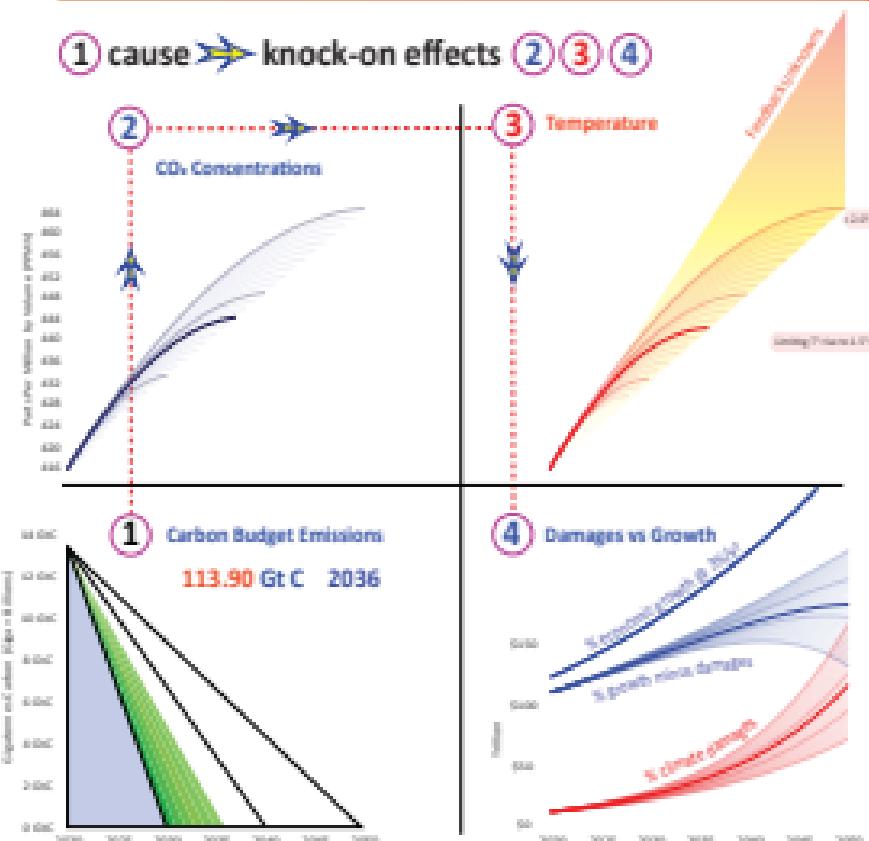


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① cause → knock-on effects ② ③ ④



Rising risks in this chain of causation . . .

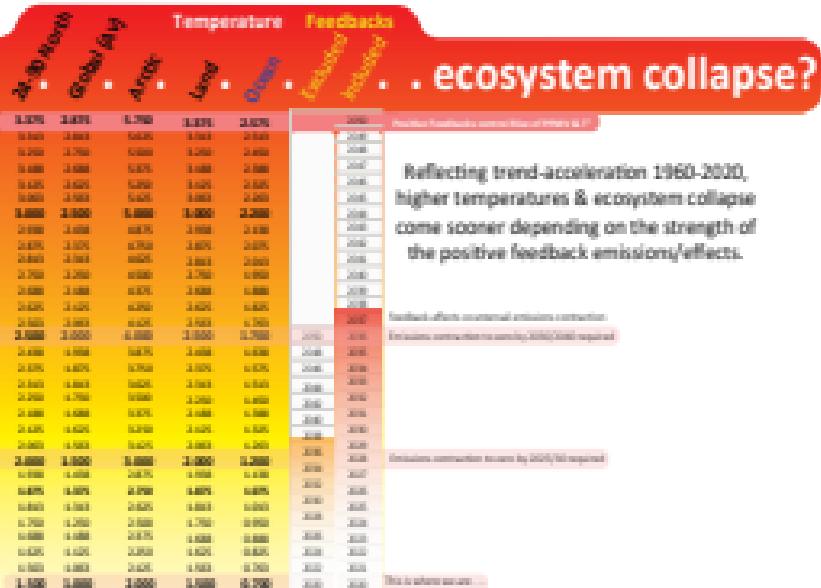
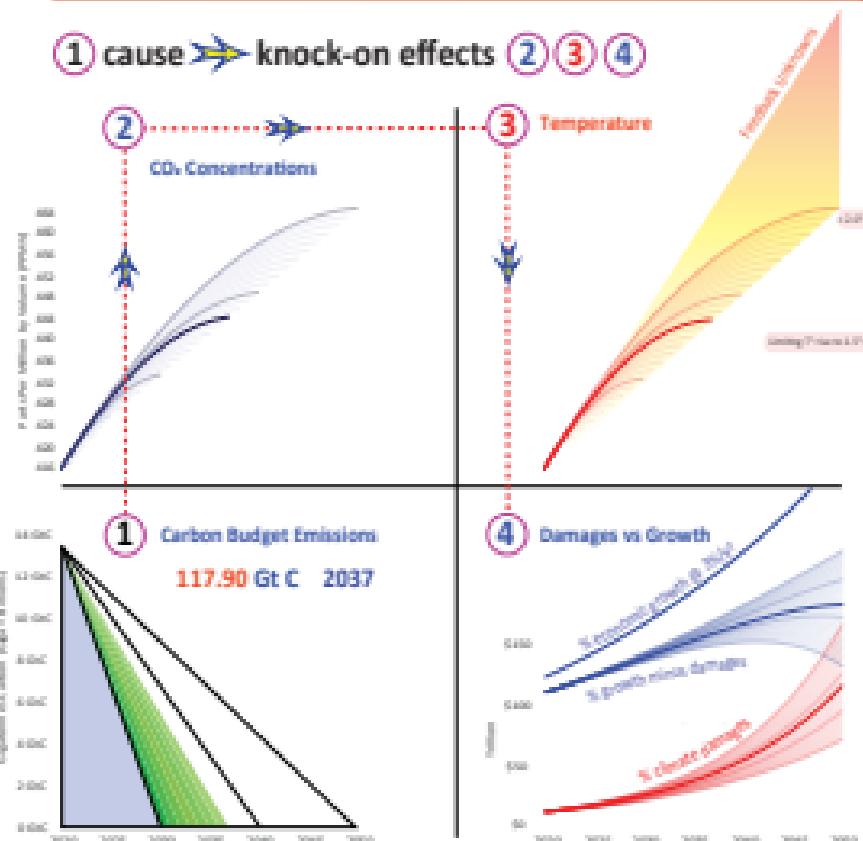
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# Zero emissions globally 2030-2040 to avoid ecosystem collapse?

Temperature

Feedbacks

① cause → knock-on effects ② ③ ④



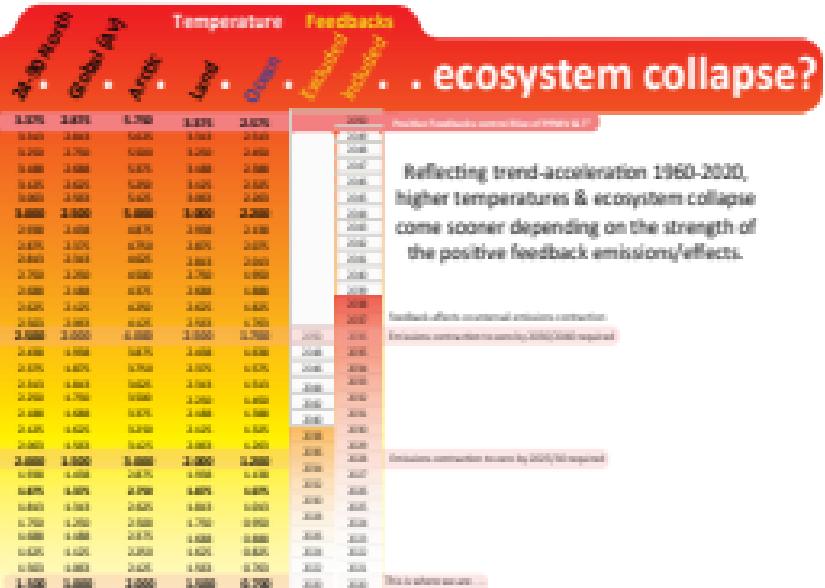
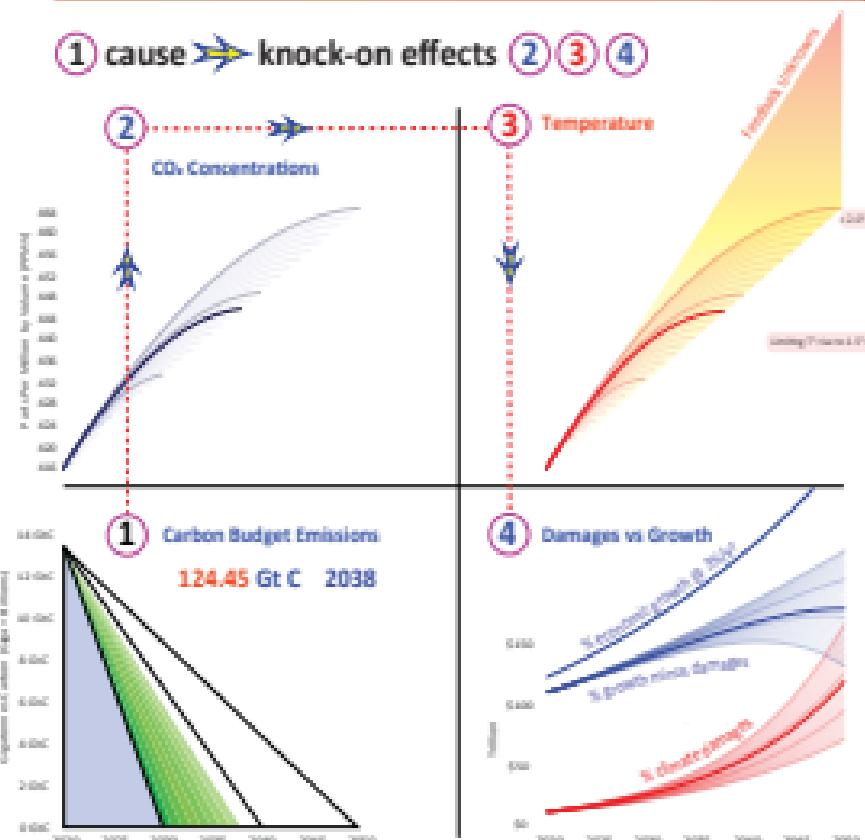
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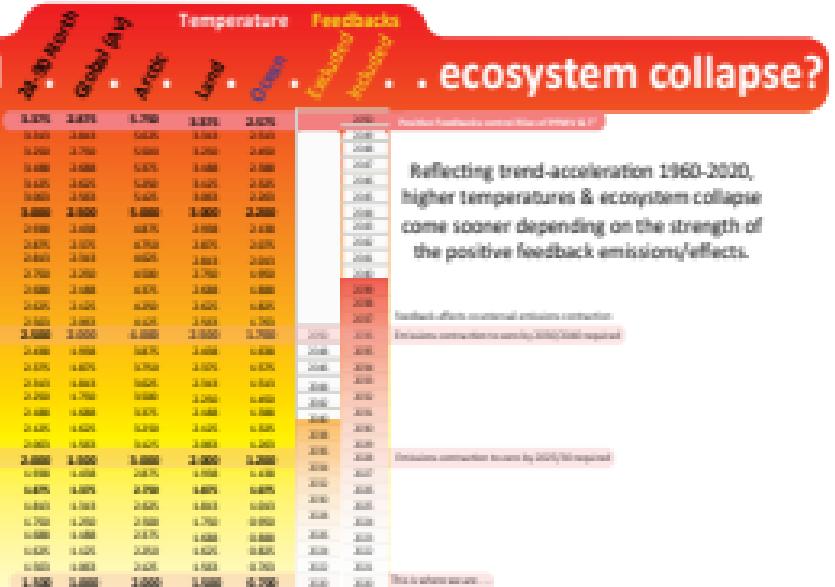
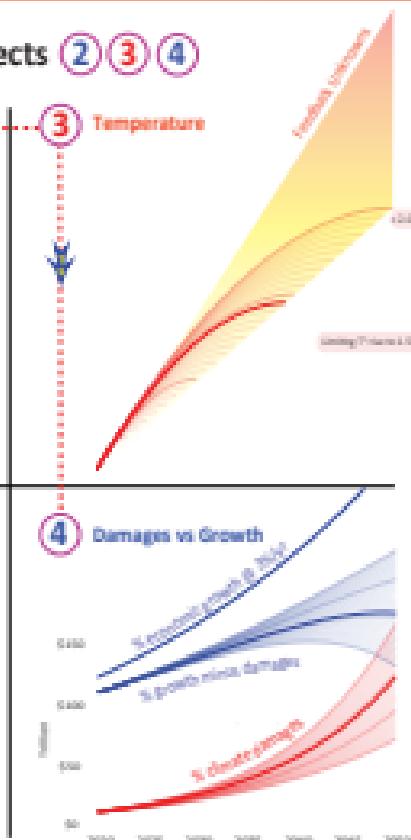
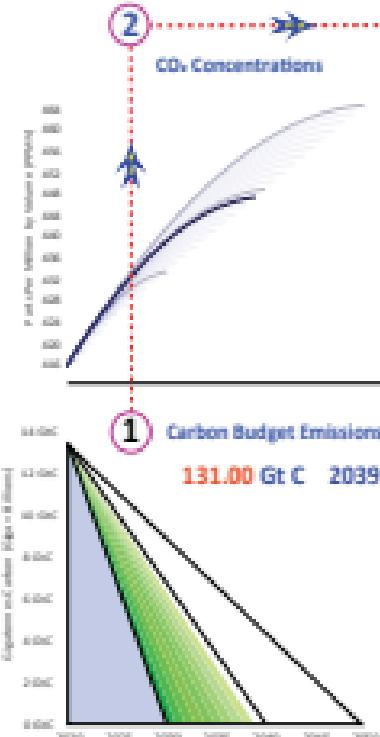


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Zero emissions globally 2030-2040 to avoid . . . ecosystem collapse?

① cause  knock-on effects ② ③ ④



## Rising risks in this chain of causation . . .

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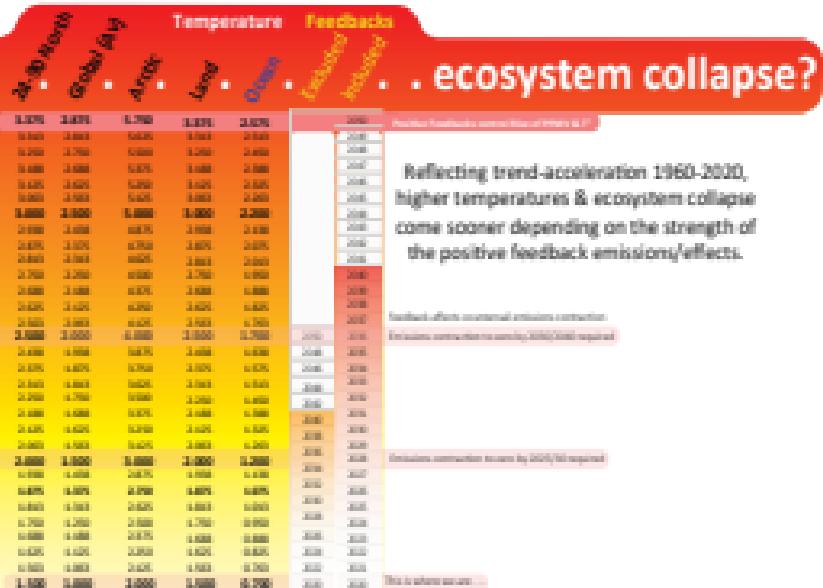
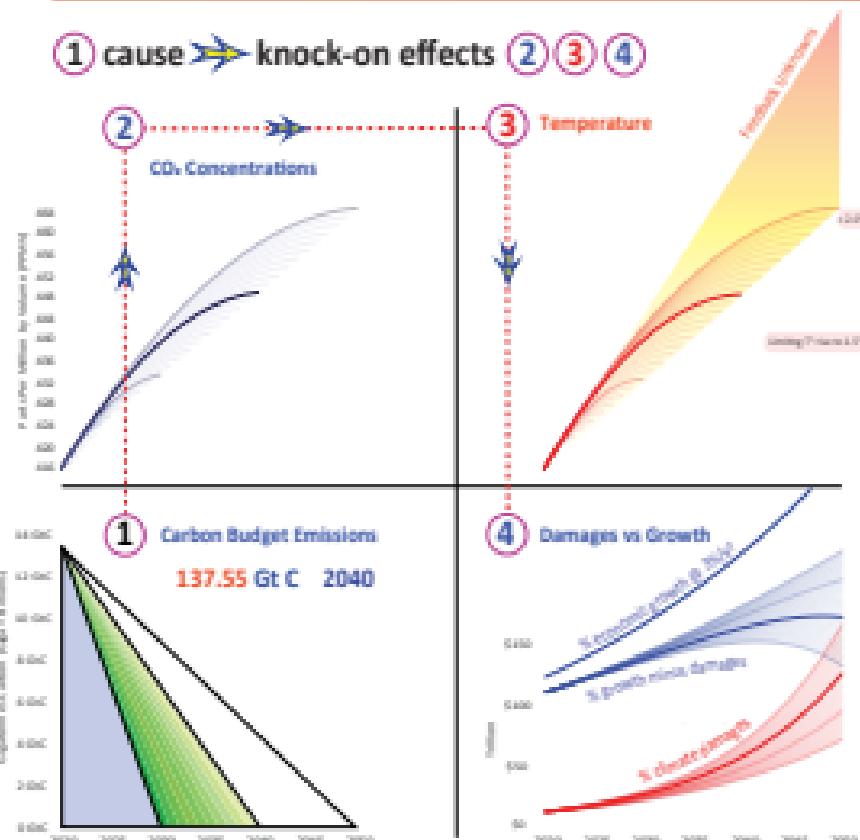
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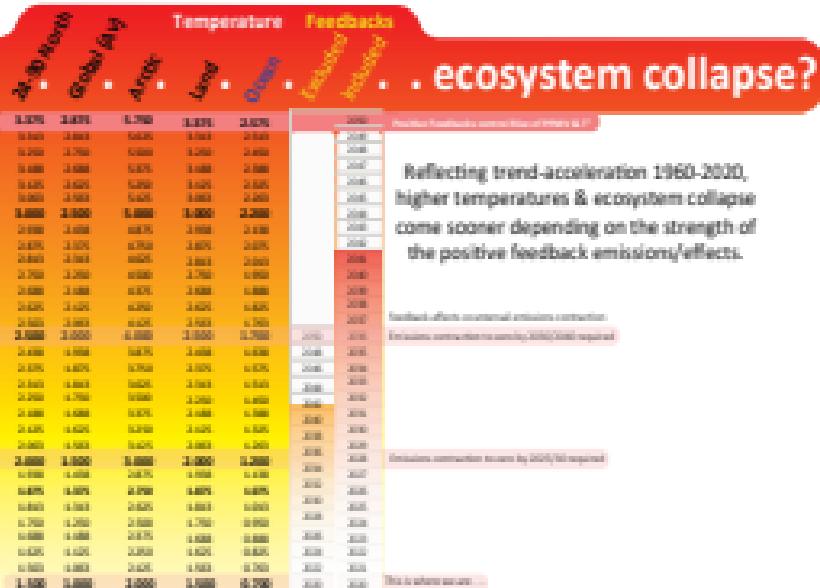
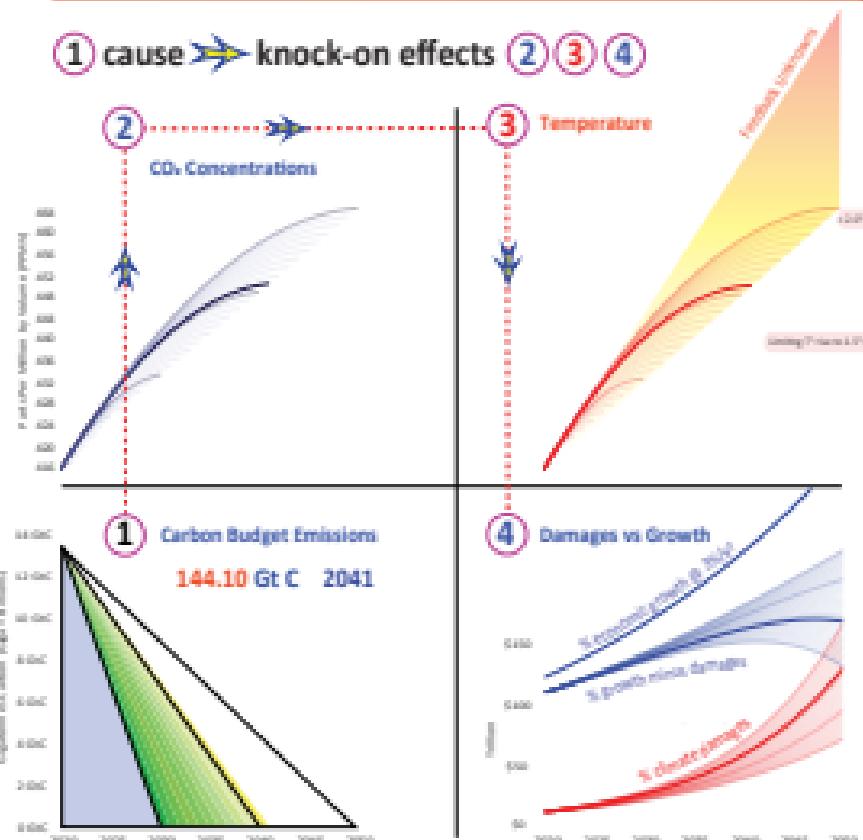
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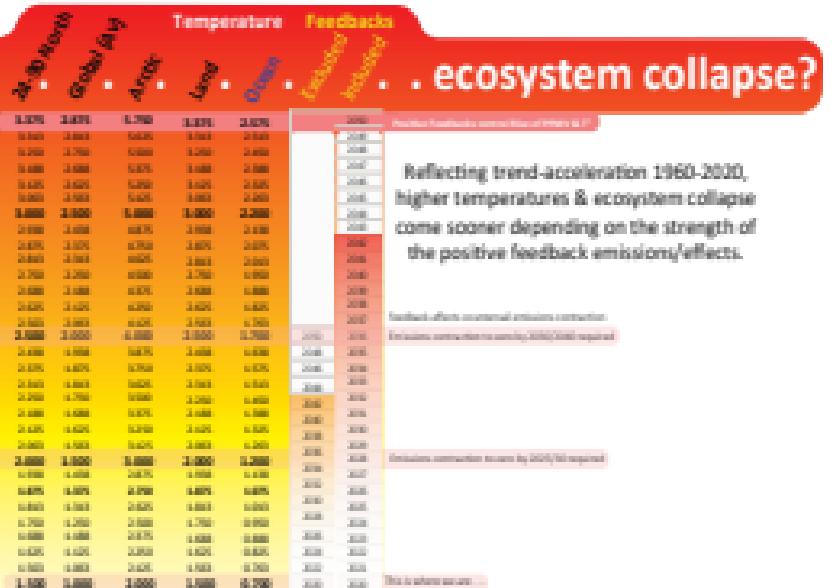
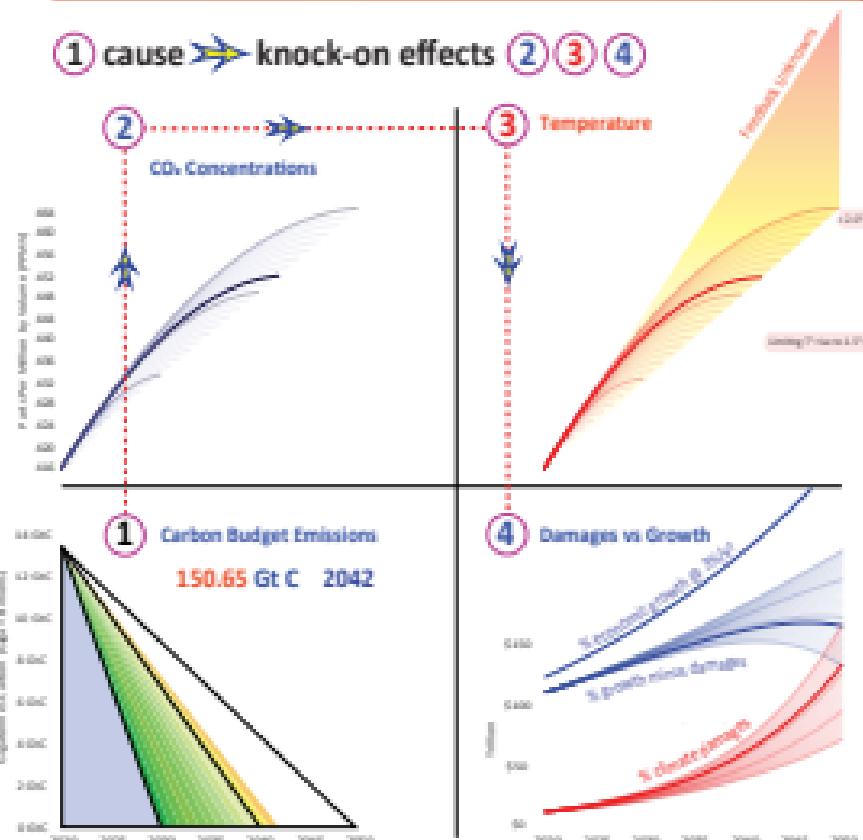
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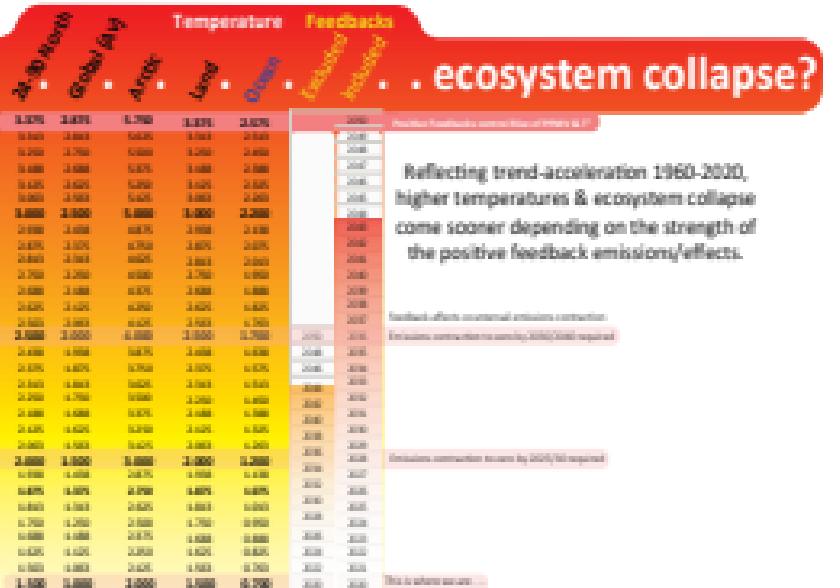
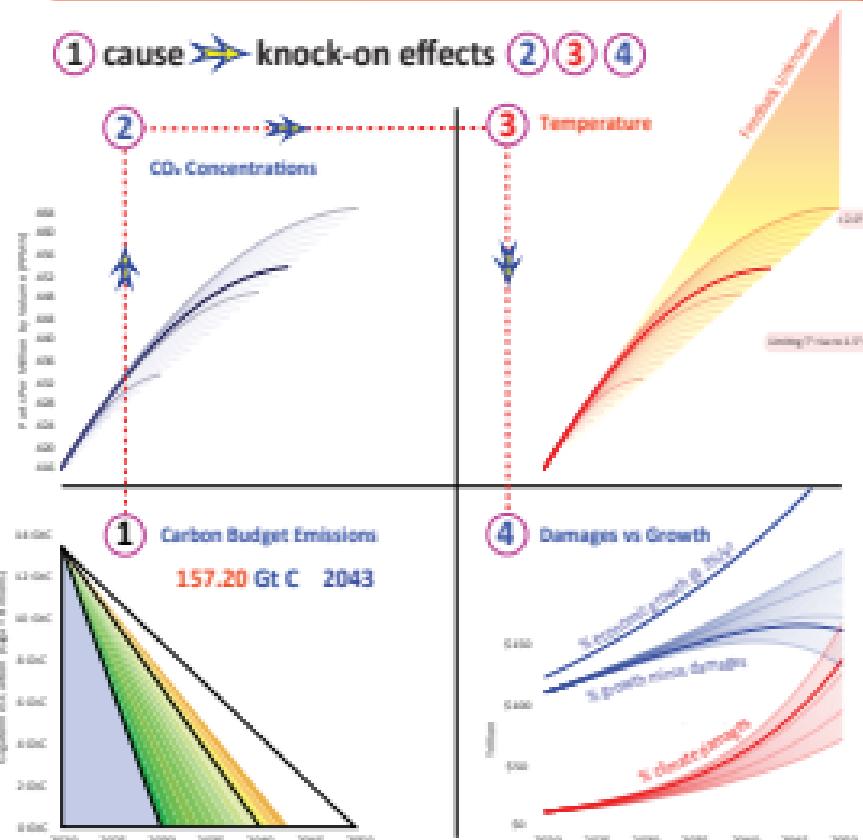
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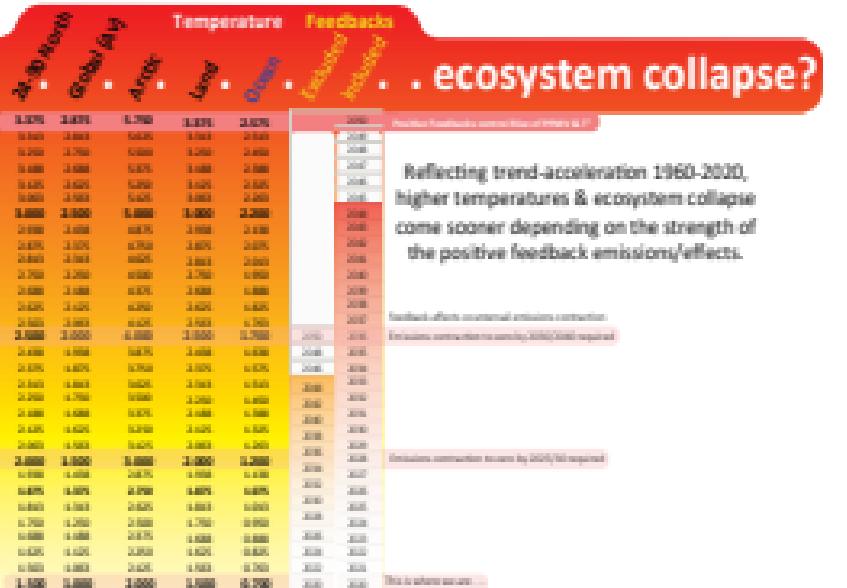
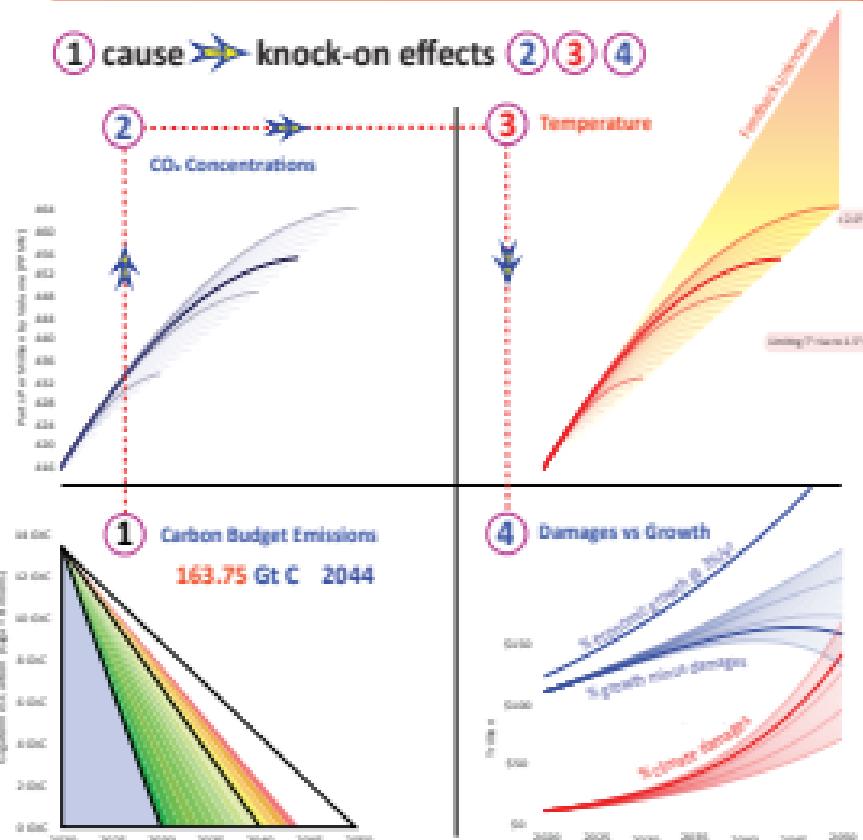
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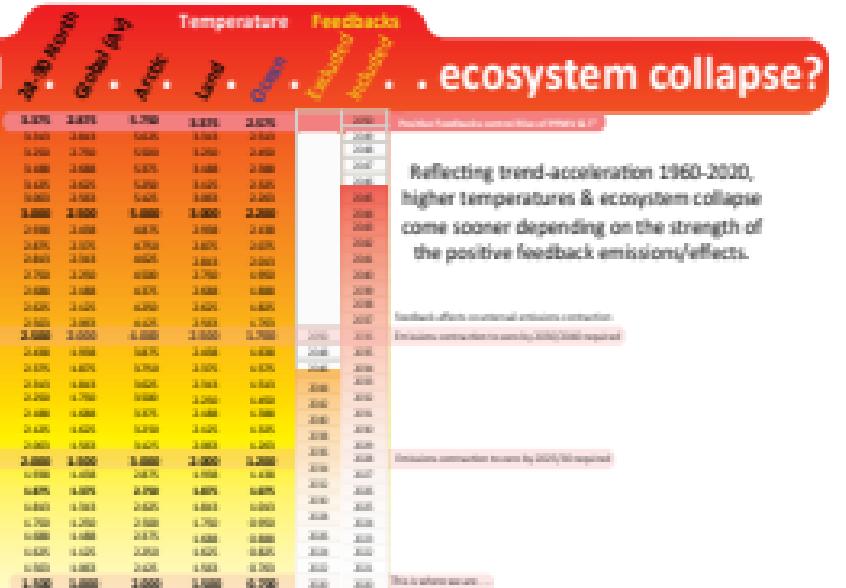
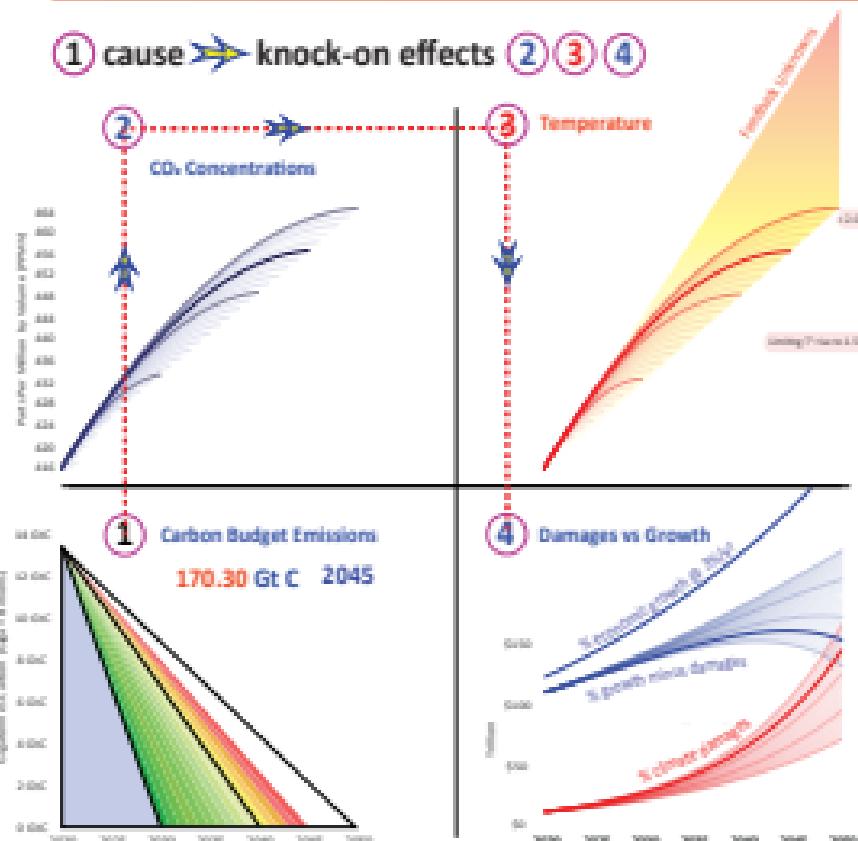
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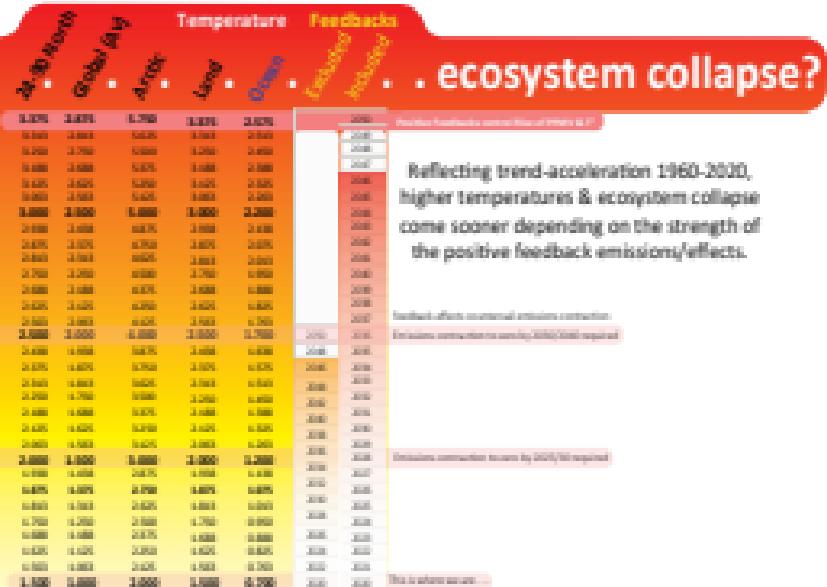
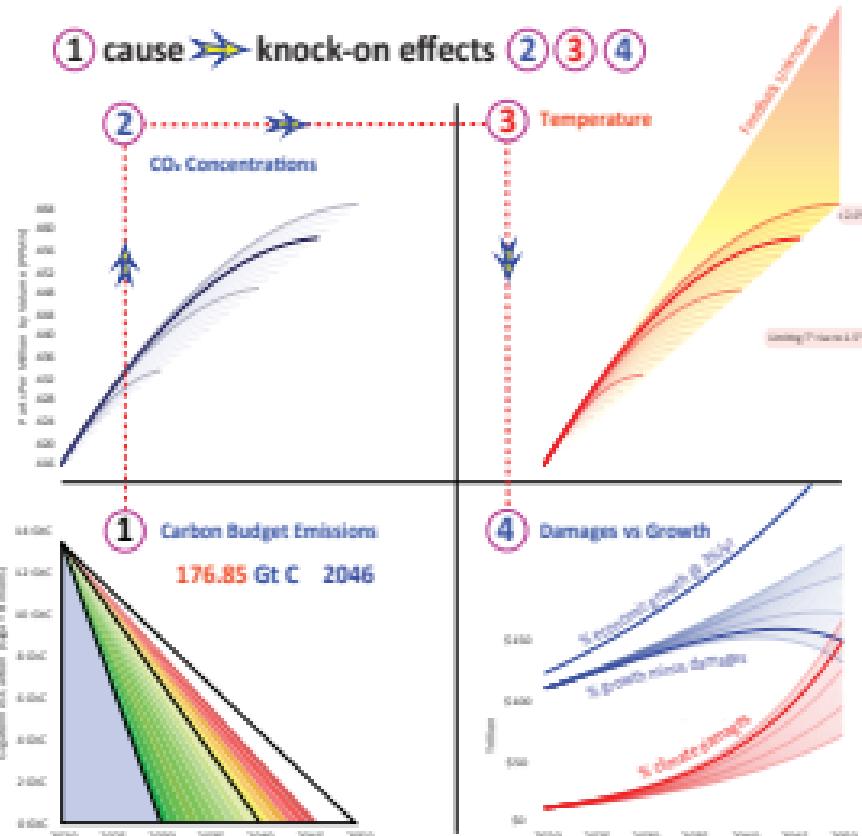


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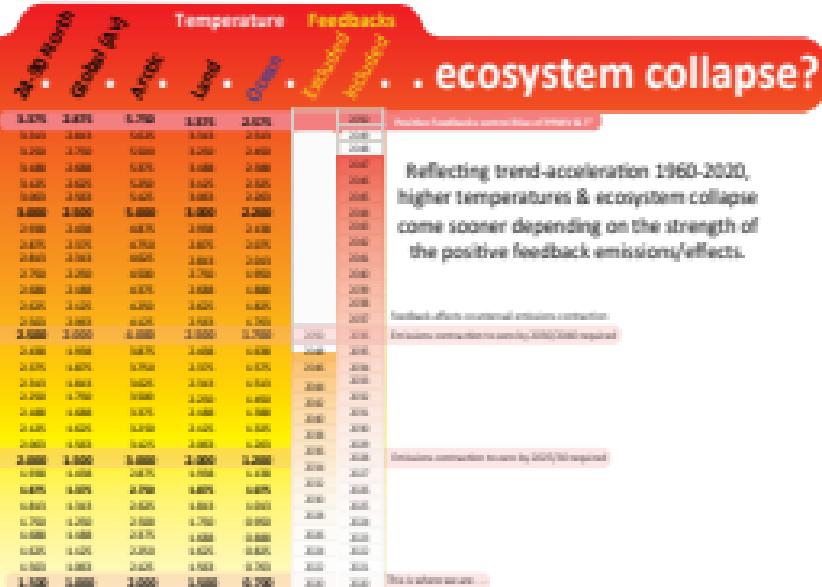
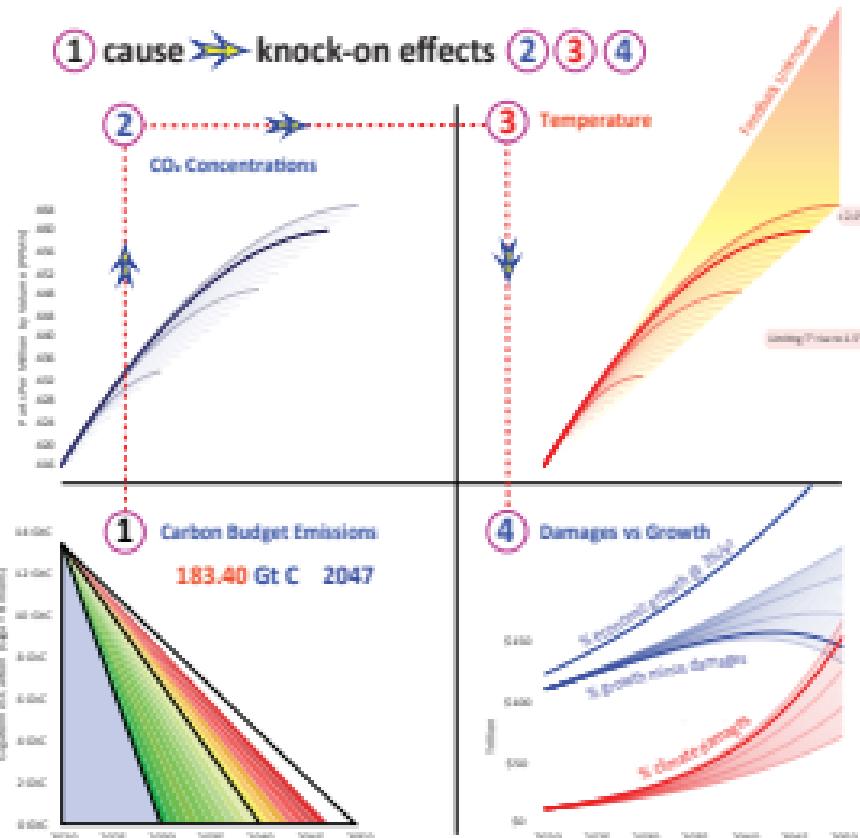
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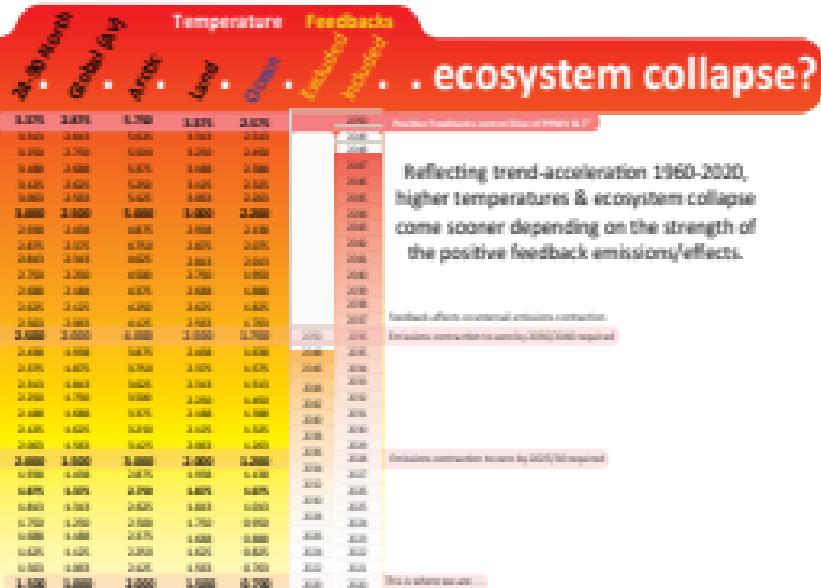
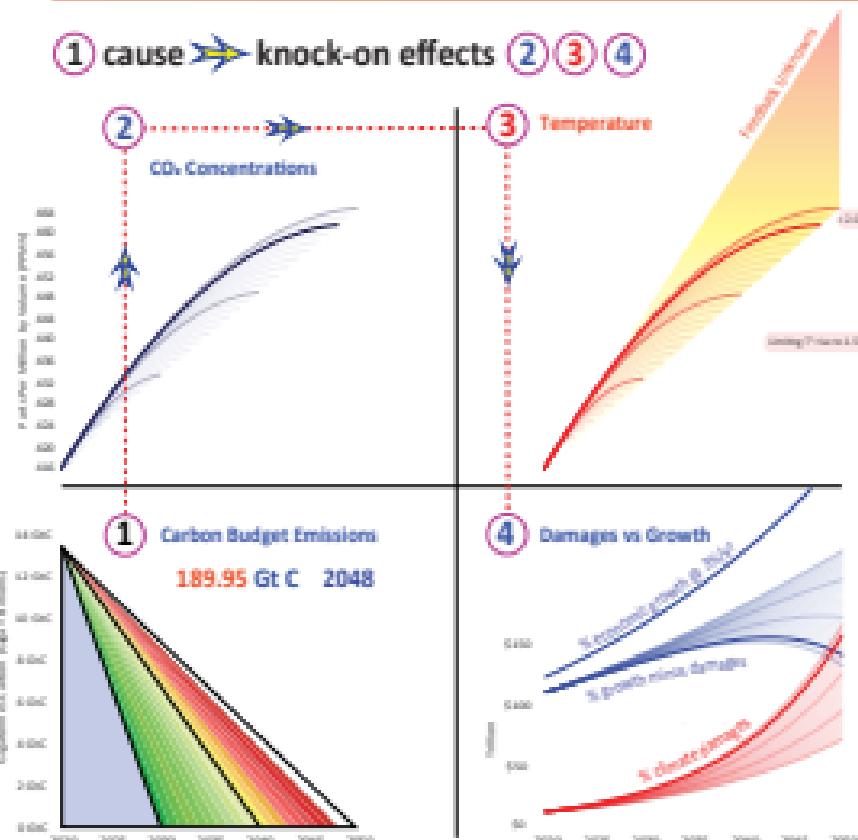
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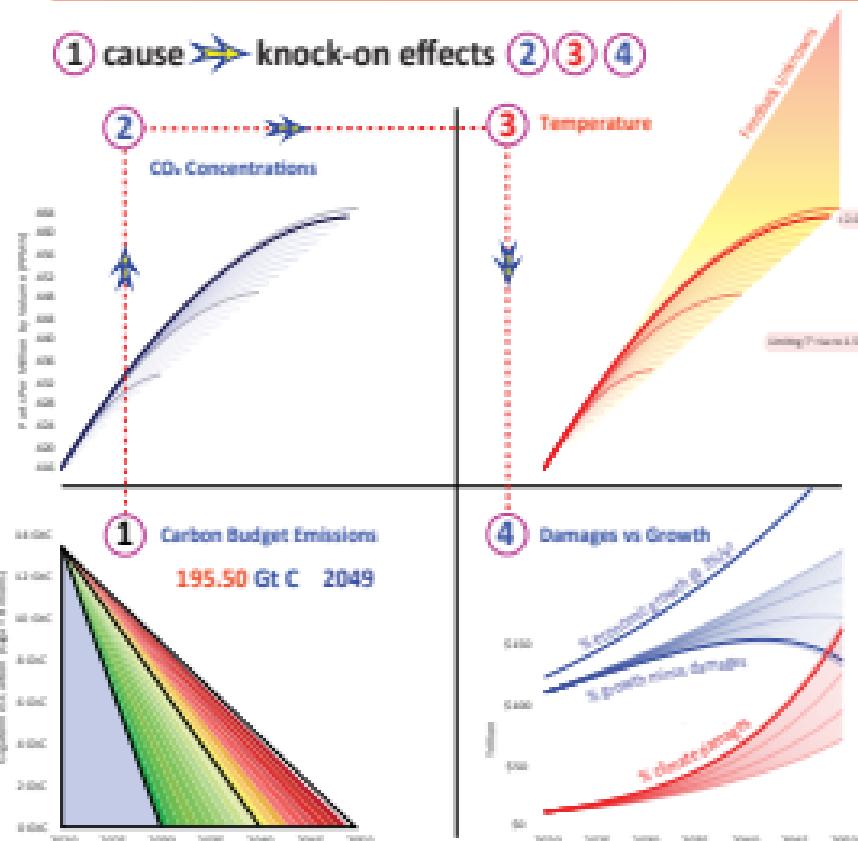
# Zero emissions globally 2030-2040 to avoid

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Year	2.0°C	2.2°C	2.4°C	2.6°C	2.8°C	3.0°C	3.2°C	3.4°C	3.6°C	3.8°C	4.0°C
2020	1.800	1.800	1.800	1.800	1.800	1.800	1.800	1.800	1.800	1.800	1.800
2025	1.850	1.850	1.850	1.850	1.850	1.850	1.850	1.850	1.850	1.850	1.850
2030	1.900	1.900	1.900	1.900	1.900	1.900	1.900	1.900	1.900	1.900	1.900
2035	1.950	1.950	1.950	1.950	1.950	1.950	1.950	1.950	1.950	1.950	1.950
2040	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000
2045	2.050	2.050	2.050	2.050	2.050	2.050	2.050	2.050	2.050	2.050	2.050
2050	2.100	2.100	2.100	2.100	2.100	2.100	2.100	2.100	2.100	2.100	2.100
2055	2.150	2.150	2.150	2.150	2.150	2.150	2.150	2.150	2.150	2.150	2.150
2060	2.200	2.200	2.200	2.200	2.200	2.200	2.200	2.200	2.200	2.200	2.200
2065	2.250	2.250	2.250	2.250	2.250	2.250	2.250	2.250	2.250	2.250	2.250
2070	2.300	2.300	2.300	2.300	2.300	2.300	2.300	2.300	2.300	2.300	2.300
2075	2.350	2.350	2.350	2.350	2.350	2.350	2.350	2.350	2.350	2.350	2.350
2080	2.400	2.400	2.400	2.400	2.400	2.400	2.400	2.400	2.400	2.400	2.400

Reflecting trend-acceleration 1960-2010, higher temperatures & ecosystem collapse come sooner depending on the strength of the positive feedback emissions/effects.

Positive Feedbacks increase warming & faster

Feedbacks increase warming & faster

Emissions contraction needed by 2030/2040 required

Emissions contraction needed by 2040/2050 required

Emissions contraction needed by 2050/2060 required

Emissions contraction needed by 2060/2070 required

Emissions contraction needed by 2070/2080 required

Emissions contraction needed by 2080/2090 required

Emissions contraction needed by 2090/2100 required

No action scenario

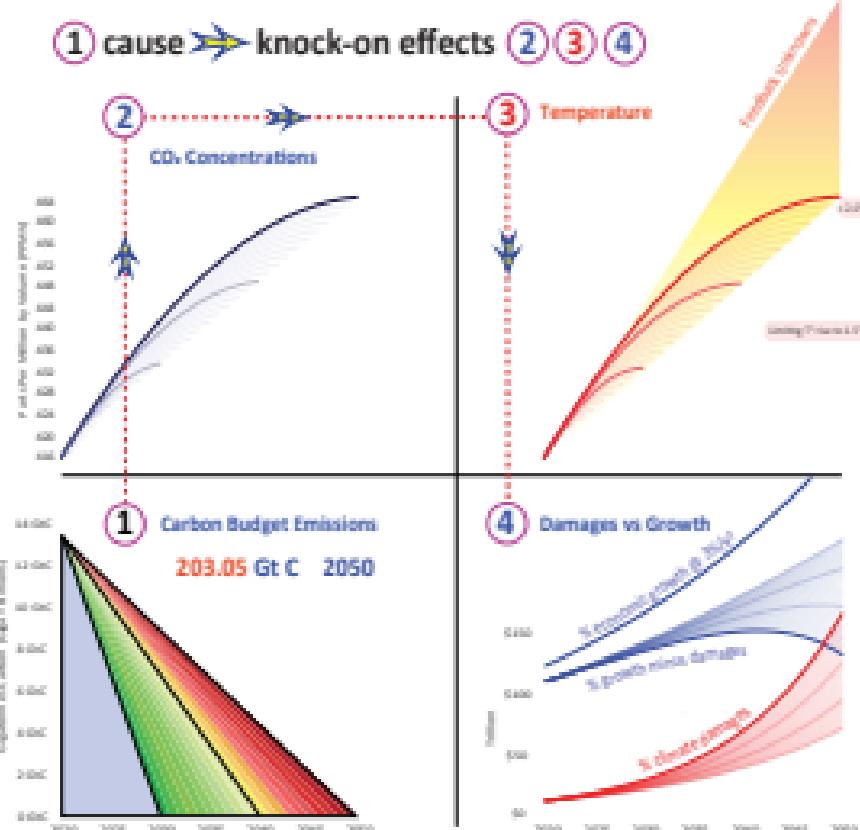
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... ecosystem collapse?

① cause → knock-on effects ② ③ ④



Year	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050								
CO <sub>2</sub> ppm	410	410.5	411	411.5	412	412.5	413	413.5	414	414.5	415	415.5	416	416.5	417	417.5	418	418.5	419	419.5	420	420.5	421	421.5	422	422.5	423	423.5	424	424.5	425	425.5	426						
Temperature °C	1.2	1.25	1.3	1.35	1.4	1.45	1.5	1.55	1.6	1.65	1.7	1.75	1.8	1.85	1.9	1.95	2.0	2.05	2.1	2.15	2.2	2.25	2.3	2.35	2.4	2.45	2.5	2.55	2.6	2.65	2.7	2.75	2.8	2.85	2.9				
Growth minus damages %	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	1.0	1.05	1.1	1.15	1.2	1.25	1.3	1.35	1.4	1.45	1.5	1.55	1.6	1.65	1.7	1.75	1.8	1.85	1.9	1.95	2.0	2.05	2.1	2.15	2.2				
% Climate damage	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	1.0	1.05	1.1	1.15	1.2	1.25	1.3	1.35	1.4	1.45	1.5	1.55	1.6	1.65	1.7	1.75	1.8	1.85	1.9	1.95	2.0

Rising risks in this chain of causation . . .

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