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A global economic assessment of city policies to reduce climate change impacts

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1. Supplementary results

1.1. Supplementary Tables

Table S1. Differences in GDP loss from global and local climate change.

	RCP8.5	RCP4.5
Global climate change		
2050	0.90% (0.5%—1.68%)	0.69% (0.37%—1.29%)
2100	3.85% (2.09%—7.19%)	1.23% (0.67%—2.30%)
Global plus local climate change		
2050	1.70% (0.93%—3.83%)	1.40% (0.76%—3.36%)
2100	5.64% (3.01%—10.88%)	2.27% (1.22%—5.07%)

Notes: Figures in parenthesis represent the 2.5 and 97.5 percentiles.

Table S2. Options for mitigating the UHI, their cooling effect and costs.

	Cool roofs	Green roofs	Cool pavement
Option	Liquid applied coating	No irrigation added	Hot mix asphalt with light aggregate
Cooling effect	0.2°C (50% area)	0.45°C (50% area) [0.1-0.8]	0.6°C (100% area)
Costs	7.5 (\$/m ²) [6.5-8.6]	161.5 (\$/m ²) [107.6-215.3]	8.6 (\$/m ²) [1.1-16.15]

Notes: Figures in brackets represent the range of values included in EPA²

Table S3. Percent of avoided urban impacts from global stabilization scenarios with respect to the baseline scenarios RCP8.5, RCP6 and RCP4.5.

	RCP8.5	RCP6	RCP4.5
550ppm	-34.5%	-7.25%	-2.04%
450ppm	-43.0%	-19.4%	-14.9%
RCP3PD	-48.4%	-27.0%	-22.9%
350ppm	-49.8%	-29.0%	-25.0%

Notes: Figures represent the urban impacts that would be avoided due to the implementation of the global stabilization scenarios as a percentage of the urban impacts under the reference scenarios. Figures are rounded to three significant digits.

Table S4. Avoided urban impacts of local policies as a fraction of the avoided urban impacts from global stabilization scenarios.

Policy A	550ppm	450ppm	RCP3PD	350ppm
RCP8.5	60%	48%	43%	42%
RCP6	345%	129%	93%	86%
RCP4.5	1270%	175%	114%	104%
Policy B	550ppm	450ppm	RCP3PD	350ppm
RCP8.5	30%	24%	21%	21%
RCP6	174%	65%	47%	43%
RCP4.5	642%	88%	57%	52%
Policy C	550ppm	450ppm	RCP3PD	350ppm
RCP8.5	39%	31%	27%	27%
RCP6	221%	83%	59%	55%
RCP4.5	817%	112%	73%	67%
Policy D	550ppm	450ppm	RCP3PD	350ppm
RCP8.5	20%	16%	14%	14%
RCP6	116%	43%	31%	29%
RCP4.5	429%	59%	38%	35%

Notes: Figures represent the avoided impacts obtained from the selected local policies as a percentage of those that would be produced by different global policy scenarios. Policies: A – Large scale cool roofs and cool pavements; B – Moderate scale cool roofs and cool pavements; C – Moderate scale green and cool roofs and cool pavements; D – Small scale green and cool roofs and cool pavements.

Table S5. Costs and benefits of global and UHI reduction policies under different baseline scenarios.

	550ppm	450ppm	RCP3PD	350ppm
RCP8.5				
Net present value	\$2.85E+13 [34.5%] N \$4.14E+13 [50.2%] A \$3.5E+13 [42.4%] B \$3.58E+13 [43.3%] C \$3.18E+13 [38.5%] D	\$3.56E+13 [43.0%] N \$4.76E+13 [57.6%] A \$4.17E+13 [50.5%] B \$4.23E+13 [51.2%] C \$3.86E+13 [46.7%] D	\$4.0E+13 [48.4%] N \$5.15E+13 [62.3%] A \$4.58E+13 [55.5%] B \$4.63E+13 [56.1%] C \$4.28E+13 [51.9%] D	\$4.12E+13 [49.8%] N \$5.24E+13 [63.4%] A \$4.69E+13 [56.8%] B \$4.74E+13 [57.3%] C \$4.39E+13 [53.2%] D
Benefits/costs	\$36.0 A { \$5.37, \$15.1, \$15.6} \$63.2 B { \$6.0, \$31.7, \$25.5} \$20.9 C { \$2.35, \$9.91, \$8.59} \$23.0 D { \$1.59, \$12.4, \$9.06}	\$41.2 A { \$5.37, \$18.3, \$17.5} \$74.9 B { \$6.0, \$38.4, \$30.5} \$24.5 C { \$2.35, \$12.0, \$10.1} \$27.7 D { \$1.59, \$15.0, \$11.1}	\$44.5 A { \$5.37, \$20.2, \$18.9} \$82.3 B { \$6.0, \$42.4, \$33.9} \$26.8 C { \$2.35, \$13.3, \$11.1} \$30.7 D { \$1.59, \$16.5, \$12.5}	\$45.2 A { \$5.37, \$20.6, \$19.2} \$84.2 B { \$6.0, \$43.3, \$34.8} \$27.3 C { \$2.35, \$13.6, \$11.4} \$31.4 D { \$1.59, \$16.9, \$12.9}
Cities with net losses	1 (0.06%) A	1 (0.06%) A	1 (0.06%) A	1 (0.06%) A

	1 (0.06%) B 3 (0.18%) C 2 (0.12%) D	1 (0.06%) B 2 (0.12%) C 1 (0.06%) D	1 (0.06%) B 1 (0.06%) C 1 (0.06%) D	1 (0.06%) B 1 (0.06%) C 1 (0.06%) D
RCP6				
Net present value	\$4.24E+12 [7.25%] N \$1.72E+13 [29.5%] A \$1.08E+13 [18.5%] B \$1.15E+13 [19.7%] C \$7.56E+12 [13.0%] D	\$1.13E+13 [19.4%] N \$2.33E+13 [40.0%] A \$1.75E+13 [29.9%] B \$1.8E+13 [30.9%] C \$1.44E+13 [24.6%] D	\$1.58E+13 [27.0%] N \$2.72E+13 [46.6%] A \$2.16E+13 [37.0%] B \$2.21E+13 [37.9%] C \$1.86E+13 [31.9%] D	\$1.69E+13 [29.0%] N \$2.81E+13 [48.2%] A \$2.27E+13 [38.8%] B \$2.31E+13 [39.6%] C \$1.97E+13 [33.8%] D
Benefits/costs	\$15.5 A { \$5.37, \$2.14, \$8.02 } \$20.2 B { \$6.0, \$4.49, \$9.7 } \$7.4 C { \$2.35, \$1.4, \$3.64 } \$6.23 D { \$1.59, \$1.75, \$2.89 }	\$20.7 A { \$5.37, \$5.37, \$9.98 } \$32.0 B { \$6.0, \$11.3, \$14.7 } \$11.0 C { \$2.35, \$3.53, \$5.13 } \$10.9 D { \$1.59, \$4.4, \$4.95 }	\$24.0 A { 5.37, 7.26, 11.4 } \$39.4 B { 6.0, 15.2, 18.1 } \$13.3 C { 2.35, 4.77, 6.16 } \$13.9 D { 1.59, 5.95, 6.35 }	\$24.8 A { \$5.37, \$7.7, \$11.7 } \$41.2 B { \$6.0, \$16.2, \$19.0 } \$13.9 C { \$2.35, \$5.07, \$6.43 } \$14.6 D { \$1.59, \$6.31, \$6.73 }
Cities with net losses	6 (0.35%) A 5 (0.3%) B 49 (2.9%) C 82 (4.85%) D	4 (0.24%) A 1 (0.06%) B 10 (0.59%) C 9 (0.53%) D	3 (0.18%) A 1 (0.06%) B 8 (0.47%) C 8 (0.47%) D	2 (0.12%) A 1 (0.06%) B 8 (0.47%) C 5 (0.3%) D
RCP4.5				
Net present value	\$1.13E+12 [2.04%] N \$1.41E+13 [25.5%] A \$7.71E+12 [14.0%] B \$8.42E+12 [15.2%] C \$4.46E+12 [8.07%] D	\$8.23E+12 [14.9%] N \$2.02E+13 [36.6%] A \$1.44E+13 [26.0%] B \$1.49E+13 [27.0%] C \$1.13E+13 [20.4%] D	\$1.27E+13 [22.9%] N \$2.41E+13 [43.6%] A \$1.85E+13 [33.5%] B \$1.9E+13 [34.4%] C \$1.55E+13 [28.1%] D	\$1.38E+13 [25.0%] \$2.5E+13 [45.3%] A \$1.96E+13 [35.4%] B \$2.0E+13 [36.2%] C \$1.66E+13 [30.0%] D
Benefits/costs	\$12.9 A { \$5.37, \$0.47, \$7.06 } \$14.7 B { \$6.0, \$0.99, \$7.69 } \$5.68 C { \$2.35, \$0.31, \$3.01 } \$4.09 D { \$1.59, \$0.39, \$2.11 }	\$18.1 A { \$5.37, \$3.71, \$9.02 } \$26.5 B { \$6.0, \$7.78, \$12.7 } \$9.29 C { \$2.35, \$2.44, \$4.5 } \$8.79 D { \$1.59, \$3.04, \$4.16 }	\$21.4 A { \$5.37, \$5.59, \$10.4 } \$33.8 B { \$6.0, \$11.7, \$16.1 } \$11.6 C { \$2.35, \$3.68, \$5.53 } \$11.7 D { \$1.59, \$4.58, \$5.56 }	\$22.1 A { \$5.37, \$6.04, \$10.7 } \$35.7 B { \$6.0, \$12.7, \$17.0 } \$12.1 C { \$2.35, \$3.97, \$5.8 } \$12.5 D { \$1.59, \$4.95, \$5.95 }
Cities with net losses	11 (0.65%) A 6 (0.35%) B 312 (18.44%) C 703 (41.55%) D	6 (0.35%) A 2 (0.12%) B 18 (1.06%) C 18 (1.06%) D	4 (0.24%) A 1 (0.06%) B 10 (0.59%) C 9 (0.53%) D	4 (0.24%) A 1 (0.06%) B 9 (0.53%) C 15 (0.89%) D

Notes: All present values are net of local policy costs, not global mitigation costs. The symbol \$ denotes US dollars. Figures in brackets show the benefits (net of local policy costs) of the corresponding local policy and the stabilization scenario as a fraction of the total damages. Figures in braces show the benefit cost ratio decomposed into the contribution of local policy and interaction effects of global and local climate change, in that order. Figures in parenthesis show the percentage of cities with net losses. Policies: A – Large scale cool roofs and cool pavements; B – Moderate scale cool roofs and cool pavements; C – Moderate scale green and cool roofs and cool pavements; D – Small scale green and cool roofs and cool pavements. Figures are rounded to three significant digits.

Table S6. Accumulated economic impacts of global climate change (GCC) and urban heat island (UHI) separately and combined.

	RCP8.5	RCP6	RCP4.5	550ppm	450ppm	RCP3PD	350ppm
GCC	\$5.02E+12 [28.5%]	\$3.15E+12 [21.9%]	\$3.19E+12 [22.0%]	\$2.96E+12 [21.1%]	\$2.43E+12 [18.7%]	\$2.33E+12 [18.1%]	\$2.06E+12 [16.8%]
UHI	\$4.91E+12 [27.9%] (0.98)	\$4.91E+12 [34.1%] (1.56)	\$4.91E+12 [33.9%] (1.54)	\$4.91E+12 [35.1%] (1.66)	\$4.91E+12 [37.8%] (2.02)	\$4.91E+12 [38.1%] (2.11)	\$4.91E+12 [39.9%] (2.38)
Joint	\$1.76E+13 (3.51)	\$1.44E+13 (4.57)	\$1.45E+13 (4.55)	\$1.4E+13 (4.73)	\$1.3E+13 (5.35)	\$1.29E+13 (5.54)	\$1.23E+13 (5.97)

Notes: Figures in brackets represent the present value of losses due to GCC/UHI as a percentage of the present value of the total losses. The symbol \$ denotes US dollars. Figures in parenthesis represent the present value of the losses due to UHI/Total as a fraction of the present value of the losses produced by GCC alone. A 7% discount rate was used. Figures are rounded to three significant digits.

Table S7. Costs and benefits of urban heat island reduction policies under different baseline scenarios.

	Policy A	Policy B	Policy C	Policy D
Costs	\$1.18E+12 3.12% GUP	\$5.64E+11 1.49% GUP	\$1.80E+12 4.75% GUP	\$1.44E+12 3.81% GUP
Net benefits				
RCP8.5	\$3.91E+12 22.20% TL	\$2.03E+12 11.60% TL	\$1.50E+12 8.53% TL	\$2.95E+11 1.68% TL
RCP6	\$3.48E+12 24.20% TL	\$1.83E+12 12.70% TL	\$1.23E+12 8.55% TL	\$1.58E+11 1.10% TL
RCP4.5	\$3.53E+12 24.30% TL	\$1.85E+12 12.70% TL	\$1.26E+12 8.69% TL	\$1.74E+11 1.20% TL
NCC	\$1.11E+12 22.60% TL	\$6.73E+11 13.70% TL	-\$2.56E+11 -0.05 TL	-\$6.00E+11 -12.20% TL
Benefit-cost ratio				
RCP8.5	\$4.30 { \$1.94, \$2.36 }	\$4.61 { \$2.19, \$2.41 }	\$1.83 { \$0.86, \$0.97 }	\$1.20 { \$0.58, \$0.62 }
RCP6	\$3.94 { \$1.94, \$2.00 }	\$4.24 { \$2.19, \$2.04 }	\$1.68 { \$0.86, \$0.83 }	\$1.11 { \$0.58, \$0.52 }
RCP4.5	\$3.98 { \$1.94, \$2.04 }	\$4.28 { \$2.19, \$2.09 }	\$1.70 { \$0.86, \$0.84 }	\$1.12 { \$0.58, \$0.54 }
NCC	\$1.94	\$2.19	\$0.86	\$0.58
Cities with net losses				
RCP8.5	767 (45.30%)	722 (42.70%)	1037 (61.30%)	1194 (70.60%)
RCP6	815 (48.20%)	790 (46.70%)	1072 (63.40%)	1234 (72.90%)
RCP4.5	809 (47.80%)	786 (46.50%)	1069 (63.20%)	1228 (72.60%)
NCC	1308 (77.30%)	1201 (71.00%)	1509 (89.20%)	1572 (92.90%)
Benefits for the median city				
RCP8.5	\$1.16E+08 [-\$3.11E+08, \$1.66E+10]	\$7.74E+07 [-\$1.32E+08, \$8.56E+09]	-\$1.84E+08 [-\$2.08E+09, \$8.99E+09]	-\$1.90E+08 [-\$2.17E+09, \$4.04E+09]
RCP6	\$5.51E+07 [-\$4.25E+08, \$1.50E+10]	\$4.43E+07 [-\$1.72E+08, \$7.70E+09]	-\$2.00E+08 [-\$2.25E+09, \$8.10E+09]	-\$2.02E+08 [-\$2.23E+09, \$3.59E+09]
RCP4.5	\$5.87E+07 [-\$4.17E+08, \$1.52E+10]	\$4.63E+07 [-\$1.69E+08, \$7.80E+09]	-\$1.98E+08 [-\$2.24E+09, \$8.23E+09]	-\$2.01E+08 [-\$2.23E+09, \$3.65E+09]
NCC	-\$1.71E+08 [-\$1.11E+09, \$6.21E+09]	-\$7.13E+07 [-\$4.94E+08, \$3.57E+09]	-\$3.26E+08 [-\$2.88E+09, \$2.57E+09]	-\$2.81E+08 [-\$2.54E+09, \$7.03E+08]

Notes: GUP denotes Global Urban Product. NGCC denotes a no global climate change scenario. TL denotes the net present value of the benefits of the different policies as a fraction of the present value of the total losses. The symbol \$ denotes US dollars. Numbers in parenthesis show the percent of cities with net losses and numbers in brackets show the benefits for the cities in the 2.5 and 97.5 percentiles. Figures in braces show the benefit cost ratio decomposed into the contribution of local policy and interaction effects, in that order. Policies: A – Large scale cool roofs and cool pavements; B – Moderate scale cool roofs and cool pavements; C – Moderate scale green and cool roofs and cool pavements; D – Small scale green and cool roofs and cool pavements. Figures are rounded to three significant digits.

Table S8. Percent of avoided urban impacts from global stabilization scenarios with respect to the baseline scenarios RCP8.5, RCP6 and RCP4.5.

	RCP8.5	RCP6	RCP4.5
550ppm	-20.10%	-2.40%	-3.28%
450ppm	-25.90%	-9.51%	-10.30%
RCP3PD	-26.90%	-10.70%	-11.50%
350ppm	-30.20%	-14.80%	-15.60%

Notes: Figures represent the urban impacts that would be avoided due to the implementation of the global stabilization scenarios as a percentage of the urban impacts under the reference scenarios. Figures are rounded to three significant digits.

Table S9. Change in urban impacts from global stabilization scenarios and local urban heat island mitigation policies.

	RCP8.5	RCP6	RCP4.5
550ppm			
No local policy	-20.10%	-2.40%	-3.28%
Policy A	-46.40% [2.31]	-34.50% [14.34]	-35.10% [10.70]
Policy B	-33.60% [1.67]	-18.90% [7.84]	-19.60% [5.97]
Policy C	-37.20% [1.85]	-23.30% [9.68]	-24.00% [7.31]
Policy D	-29.10% [1.45]	-13.50% [5.59]	-14.20% [4.34]
450ppm			
No local policy	-26.00%	-9.51%	-10.30%
Policy A	-51.20% [1.98]	-40.50% [4.25]	-41.00% [3.97]
Policy B	-38.90% [1.50]	-25.40% [2.67]	-26.10% [2.53]
Policy C	-42.40% [1.64]	-29.70% [3.12]	-30.30% [2.94]
Policy D	-34.60% [1.34]	-20.20% [2.12]	-20.90% [2.02]
RCP3PD			
No local policy	-26.90%	-10.70%	-11.50%
Policy A	-52.20% [1.94]	-41.60% [3.90]	-42.20% [3.67]
Policy B	-39.90% [1.49]	-26.60% [2.49]	-27.30% [2.37]
Policy C	-43.40% [1.61]	-30.90% [2.89]	-31.50% [2.74]
Policy D	-35.60% [1.33]	-21.40% [2.00]	-22.10% [1.92]
350ppm			
No local policy	-30.20%	-14.80%	-15.60%
Policy A	-54.80% [1.81]	-44.90% [3.03]	-45.30% [2.91]
Policy B	-42.90% [1.42]	-30.30% [2.05]	-30.90% [1.99]
Policy C	-46.30% [1.53]	-34.40% [2.33]	-35.00% [2.25]
Policy D	-38.70% [1.28]	-25.20% [1.70]	-25.90% [1.66]

Notes: Figures represent the reduction in impacts achieved by the implementation of the selected local policies as a percentage of the impacts produced under the different reference scenarios. Numbers in brackets express avoided damages of both local and global policies as a fraction of the avoided losses that would be obtained from stabilization scenarios alone. Policies: A – Large scale cool roofs and cool pavements; B – Moderate scale cool roofs and cool pavements; C – Moderate scale green and cool roofs and cool pavements; D – Small scale green and cool roofs and cool pavements. Figures are rounded to three significant digits.

Table S10. Avoided urban impacts of local policies as a fraction of the avoided urban impacts from global stabilization scenarios.

Policy A	550ppm	450ppm	RCP3PD	350ppm
RCP8.5	144%	112%	108%	97%
RCP6	1350%	341 %	303 %	219 %
RCP4.5	990 %	314 %	282 %	209 %
Policy B	550ppm	450ppm	RCP3PD	350ppm
RCP8.5	74%	57%	55%	49%
RCP6	691%	175%	155%	112%
RCP4.5	507%	161%	145%	107%
Policy C	550ppm	450ppm	RCP3PD	350ppm
RCP8.5	93%	72%	70%	62%
RCP6	876%	221%	197%	142%
RCP4.5	643%	204%	184%	136%
Policy D	550ppm	450ppm	RCP3PD	350ppm
RCP8.5	49%	38%	37%	33%
RCP6	463%	117%	104%	75%
RCP4.5	340%	108%	97%	72%

Notes: Figures represent the avoided impacts obtained from the selected local policies as a percentage of those that would be produced by different global policy scenarios. Policies: A – Large scale cool roofs and cool pavements; B – Moderate scale cool roofs and cool pavements; C – Moderate scale green and cool roofs and cool pavements; D – Small scale green and cool roofs and cool pavements.

Table S11. Costs and benefits of global and UHI reduction policies under different baseline scenarios.

	550ppm	450ppm	RCP3PD	350ppm
RCP8.5				
Net present value	\$3.53E+12 [20.10%] N \$6.96E+12 [39.60%] A \$5.33E+12 [30.40%] B \$4.73E+12 [26.90%] C \$3.67E+12 [20.90%] D	\$4.55E+12 [25.90%] N \$7.82E+12 [44.50%] A \$6.28E+12 [35.70%] B \$5.65E+12 [32.20%] C \$4.64E+12 [26.40%] D	\$4.72E+12 [26.90%] N \$7.99E+12 [45.50%] A \$6.45E+12 [36.70%] B \$5.82E+12 [33.10%] C \$4.81E+12 [27.40%] D	\$5.31E+12 [30.20%] N \$8.45E+12 [48.10%] A \$6.98E+12 [39.70%] B \$6.33E+12 [36.00%] C \$5.36E+12 [30.50%] D
Benefits/costs	\$6.88 A { \$1.94, \$1.74, \$3.20 } \$10.50 B { \$2.19, \$3.66, \$4.60 } \$3.63 C { \$0.86, \$1.15, \$1.62 } \$3.54 D { \$0.58, \$1.43, \$1.53 }	\$7.60 A { \$1.94, \$2.19, \$3.48 } \$12.10 B { \$2.19, \$4.60, \$5.34 } \$4.14 C { \$0.86, \$1.44, \$1.62 } \$4.21 D { \$0.58, \$1.79, \$1.84 }	\$7.75 A { \$1.94, \$2.27, \$3.54 } \$12.40 B { \$2.19, \$4.78, \$5.46 } \$4.23 C { \$0.86, \$1.50, \$1.88 } \$4.33 D { \$0.58, \$1.86, \$1.88 }	\$8.14 A { \$1.94, \$2.50, \$3.70 } \$13.40 B { \$2.19, \$5.25, \$5.93 } \$4.52 C { \$0.86, \$1.64, \$2.02 } \$4.71 D { \$0.58, \$2.05, \$2.08 }
Cities with net losses	148 (8.75%) A 13 (0.77%) B 709 (41.90%) C 680 (40.20%) D	78 (4.61%) A 10 (0.59%) B 605 (35.80%) C 540 (31.90%) D	64 (3.78%) A 10 (0.59%) B 571 (33.80%) C 507 (30.00%) D	9 (0.53%) A 55 (3.25%) B 528 (31.20%) C 432 (25.50%) D
RCP6				
Net present value	\$3.46E+11 [2.40%] N \$3.78E+12 [26.30%] A \$2.15E+12 [15.00%] B \$1.55E+12 [10.80%] C \$4.90E+11 [3.41%] D	\$1.37E+12 [9.51%] N \$4.64E+12 [32.20%] A \$3.09E+12 [21.50%] B \$2.47E+12 [17.20%] C \$1.46E+12 [10.20%] D	\$1.54E+12 [10.70%] N \$4.81E+12 [33.40%] A \$3.26E+12 [22.70%] B \$2.64E+12 [18.40%] C \$1.63E+12 [11.30%] D	\$2.13E+12 [14.80%] N \$5.27E+12 [36.60%] A \$3.79E+12 [26.40%] B \$3.15E+12 [21.90%] C \$2.18E+12 [15.20%] D
Benefits/costs	\$4.19 A { \$1.94, \$0.16, \$2.09 } \$4.81 B { \$2.19, \$0.35, \$2.27 } \$1.86 C { \$0.86, \$0.11, \$0.89 } \$1.34 D { \$0.58, \$0.14, \$0.62 }	\$4.92 A { \$1.94, \$0.61, \$2.37 } \$6.49 B { \$2.19, \$1.28, \$3.01 } \$2.37 C { \$0.86, \$0.40, \$1.11 } \$2.01 D { \$0.58, \$0.50, \$0.93 }	\$5.06 A { \$1.94, \$0.70, \$2.43 } \$6.79 B { \$2.19, \$1.46, \$3.13 } \$2.47 C { \$0.86, \$0.46, \$1.15 } \$2.13 D { \$0.58, \$0.57, \$0.97 }	\$5.45 A { \$1.94, \$0.92, \$2.60 } \$7.73 B { \$2.19, \$1.93, \$3.60 } \$2.75 C { \$0.86, \$0.60, \$1.29 } \$2.51 D { \$0.58, \$0.75, \$1.17 }
Cities with net losses	775 (45.80%) A 664 (39.20%) B 1029 (60.80%) C 1132 (66.90%) D	621 (36.70%) A 258 (15.30%) B 903 (53.40%) C 938 (55.40%) D	573 (33.90%) A 159 (9.40%) B 873 (51.60%) C 897 (53.00%) D	512 (30.30%) A 83 (4.90%) B 844 (49.90%) C 852 (50.40%) D
RCP4.5				
Net present value	\$4.76E+11 [3.28%] N \$3.91E+12 [26.90%] A \$2.28E+12 [15.70%] B \$1.68E+12 [11.60%] C \$6.19E+11 [4.30%] D	\$1.50E+12 [10.30%] N \$4.77E+12 [32.80%] A \$3.22E+12 [22.20%] B \$2.60E+12 [17.90%] C \$1.59E+12 [11.00%] D	\$1.67E+12 [11.50%] N \$4.94E+12 [34.00%] A \$3.39E+12 [23.40%] B \$4.94E+12 [34.00%] C \$1.76E+12 [12.10%] D	\$2.26E+12 [15.60%] N \$5.40E+12 [37.20%] A \$3.92E+12 [27.00%] B \$3.28E+12 [22.60%] C \$2.31E+12 [15.90%] D
Benefits/costs	\$4.30 A	\$5.03 A	\$5.17 A	\$5.56 A

	{ \$1.94, \$0.20, \$2.17 } \$5.04 B { \$2.19, \$0.41, \$2.44 } \$1.93 C { \$0.86, \$0.13, \$0.95 } \$1.43 D { \$0.58, \$0.16, \$0.68 }	{ \$1.94, \$0.64, \$2.45 } \$6.72 B { \$2.19, \$1.35, \$3.18 } \$2.44 C { \$0.86, \$0.42, \$1.16 } \$2.10 D { \$0.58, \$0.52, \$0.99 }	{ \$1.94, \$0.73, \$2.51 } \$7.02 B { \$2.19, \$1.53, \$3.30 } \$2.54 C { \$0.86, \$0.48, \$1.20 } \$2.22 D { \$0.58, \$0.60, \$1.04 }	{ \$1.94, \$0.95, \$2.67 } \$7.96 B { \$2.19, \$1.99, \$3.77 } \$2.82 C { \$0.86, \$0.62, \$1.34 } \$2.60 D { \$0.58, \$0.78, \$1.24 }
Cities with net losses	770 (45.50%) A 645 (38.10%) B 1024 (60.50%) C 1122 (66.30%) D	617 (36.50%) A 262 (15.50%) B 901 (53.30%) C 935 (55.30%) D	563 (33.30%) A 165 (9.80%) B 869 (51.40%) C 892 (52.70%) D	510 (30.10%) A 87 (5.10%) B 842 (49.80%) C 849 (50.20%) D

Notes: All present values are net of local policy costs, not global mitigation costs. The symbol \$ denotes US dollars. Figures in brackets show the benefits (net of local policy costs) of the corresponding local policy and the stabilization scenario as a fraction of the total damages. Figures in braces show the benefit cost ratio decomposed into the contribution of local policy, global policy and interaction effects, in that order. Figures in parenthesis show the percentage of cities with net losses. Policies: A – Large scale cool roofs and cool pavements; B – Moderate scale cool roofs and cool pavements; C – Moderate scale green and cool roofs and cool pavements; D – Small scale green and cool roofs and cool pavements. Figures are rounded to three significant digits.

Table S12. Costs and benefits of urban heat island reduction policies under different baseline scenarios and assuming the lower bound of temperature reduction by green roofs.

	Policy C	Policy D
Costs	\$1.80E+12 4.75% GUP	\$1.44E+12 3.81% GUP
Net present value		
RCP8.5	\$7.66E+12 9.27% TL	\$2.71E+12 3.28% TL
RCP6	\$6.29E+12 10.8% TL	\$2.12E+12 3.63% TL
RCP4.5	\$6.18E+12 11.2% TL	\$2.07E+12 3.75% TL
NGCC	\$2.44E+12 12.3% TL	\$2.38E+11 1.54% TL
Benefit-cost ratio		
RCP8.5	\$5.26 { \$2.05, \$3.20 }	\$2.87 { \$1.16, \$1.71 }
RCP6	\$4.5 { \$2.05, \$2.44 }	\$2.47 { \$1.16, \$1.30 }
RCP4.5	\$4.43 { \$2.05, \$2.38 }	\$2.43 { \$1.16, \$1.27 }
NGCC	\$2.05	\$1.16
Cities with net losses		
RCP8.5	251 (14.8%)	842 (49.8%)
RCP6	616 (36.4%)	882 (52.1%)
RCP4.5	645 (38.1%)	888 (52.5%)
NGCC	1177 (69.6%)	1364 (80.6%)
Benefits for the median city		
RCP8.5	\$6.3E+08 [-\$2.5E+08, \$3.17E+10]	\$1.61E+08 [-\$6.74E+08, \$1.26E+10]
RCP6	\$3.63E+08 [-\$3.43E+08, \$2.64E+10]	-\$7.84E+07 [-\$9.75E+08, \$1.04E+10]
RCP4.5	\$3.3E+08 [-\$3.53E+08, \$2.60E+10]	-\$8.31E+07 [-\$9.82E+08, \$1.02E+10]
NGCC	-\$2.16E+08 [-\$1.39E+09, \$1.02E+10]	-\$2.20E+08 [-\$1.92E+09, \$3.41E+09]

Notes: GUP denotes Global Urban Product. NGCC denotes a no global climate change scenario. TL denotes the net present value of the benefits of the different policies as a fraction of the present value of the total losses. Numbers in parenthesis show the percent of cities with net losses and numbers in brackets show the benefits for the cities in the 2.5 and 97.5 percentiles. The symbol \$ denotes US dollars. Figures in braces show the benefit cost ratio decomposed into the contribution of local policy and interaction effects of global and local climate change, in that order. Policies: C – Moderate scale green and cool roofs and cool pavements; D – Small scale green and cool roofs and cool pavements. Figures are rounded to three significant digits.

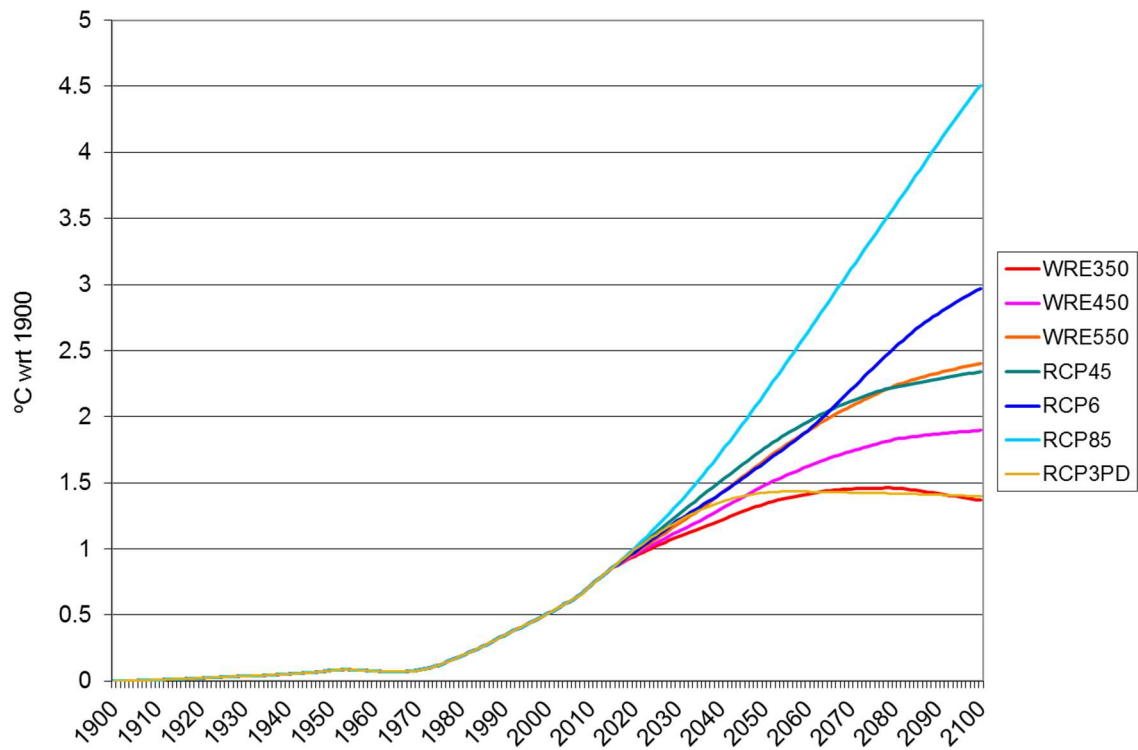
Table S13. Costs and benefits of urban heat island reduction policies under different baseline scenarios and assuming the upper bound of temperature reduction by green roofs.

	Policy C	Policy D
Costs	\$1.80E+12 4.75% GUP	\$1.44E+12 3.81% GUP
Net present value		
RCP8.5	\$1.06E+13 12.87% TL	\$5.84E+12 7.06% TL
RCP6	\$8.81E+12 15.1% TL	\$4.79E+12 8.21% TL
RCP4.5	\$8.65E+12 15.66% TL	\$4.70E+12 8.51% TL
NGCC	\$2.95E+12 19.1% TL	\$1.45E+12 9.36% TL
Benefit-cost ratio		
RCP8.5	\$6.91 { \$2.64, \$4.27 }	\$5.04 { \$2.00, \$3.04 }
RCP6	\$5.89 { \$2.64, \$3.25 }	\$4.32 { \$2.00, \$2.32 }
RCP4.5	\$5.81 { \$2.64, \$3.17 }	\$4.26 { \$2.00, \$2.26 }
NGCC	\$2.64	\$2.00
Cities with net losses		
RCP8.5	95 (5.61%)	327 (19.3%)
RCP6	197 (11.6%)	655 (38.7%)
RCP4.5	260 (15.4%)	689 (40.7%)
NGCC	1101 (65.1%)	1178 (69.6%)
Benefits for the median city		
RCP8.5	\$1.08E+09 [-\$1.33E+08, \$4.51E+10]	\$3.47E+08 [-\$2.10E+08, \$2.42E+10]
RCP6	\$7.35E+08 [-\$2.12E+08, \$3.92E+10]	\$2.43E+08 [-\$2.9E+08, \$1.98E+10]
RCP4.5	\$7.04E+08 [-\$2.23E+08, \$3.88E+10]	\$2.21E+08 [-\$3.11E+08, \$1.95E+10]
NGCC	-\$1.70E+08 [-\$1.01E+09, \$1.37E+10]	-\$1.74E+08 [-\$1.14E+09, \$7.81E+09]

Notes: GUP denotes Global Urban Product. NGCC denotes a no global climate change scenario. TL denotes the net present value of the benefits of the different policies as a fraction of the present value of the total losses. Numbers in parenthesis show the percent of cities with net losses and numbers in brackets show the benefits for the cities in the 2.5 and 97.5 percentiles. The symbol \$ denotes US dollars. Figures in braces show the benefit cost ratio decomposed into the contribution of local policy and interaction effects of global and local climate change, in that order. Policies: C – Moderate scale green and cool roofs and cool pavements; D – Small scale green and cool roofs and cool pavements. Figures are rounded to three significant digits.

1.2. Supplementary Figures

Figure S1. Global climate change projections based on the RCP8.5, RCP6, RCP4.5, RCP3PD, WRE550, WRE450, WRE350.



2. List of cities

Afghanistan (Herat, Kabul, Kandahar)
Albania (Tiranë (Tirana))
Algeria (Annaba, Batna, Blida, El Djazaïr (Algiers), El Djelfa, Qacentina, Wahran (Oran))
Angola (Huambo, Luanda, Lubango)
Argentina (Bahia Blanca, Buenos Aires, Córdoba, Corrientes, La Plata, Mar Del Plata, Mendoza, Neuquén-Plottier-Cipolletti, Posadas, Resistencia, Rosario, Salta, San Juan, San Miguel de Tucumán, San Salvador de Jujuy, Santa Fe, Santiago Del Estero)
Armenia (Yerevan)
Australia (Adelaide, Brisbane, Canberra, Gold Coast, Melbourne, Newcastle and Lake Macquarie, Perth, Sunshine Coast, Sydney)
Austria (Wien (Vienna))
Azerbaijan (Baku, Gäncä, Sumquayit)
Bahrain (Al-Manamah (Manama))
Bangladesh (Barisal, Bogra, Chittagong, Comilla, Dhaka, Khulna, Mymensingh, Rajshahi, Rangpur, Sylhet)
Belarus (Brest, Gomel, Grodno, Minsk, Mogilev, Vitebsk)
Belgium (Antwerpen, Bruxelles-Brussel, Charleroi, Gent, Liège)
Benin (Abomey-Calavi, Cotonou)
Bolivia (Plurinational State of) (Cochabamba, La Paz, Santa Cruz, Sucre)
Bosnia and Herzegovina (Sarajevo)
Brazil (Anápolis, Aracaju, Baixada Santista, Bauru, Belém, Belo Horizonte, Blumenau, Boa Vista, Brasília, Campina Grande, Campinas, Campo Grande, Campos dos Goytacazes, Caruaru, Caxias Do Sul, Cuiabá, Curitiba, Feira De Santana, Florianópolis, Fortaleza, Franca, Goiânia, Grande São Luís, Grande Vitória, João Pessoa, Joinville, Juazeiro Do Norte, Juiz De Fora, Jundiaí, Londrina, Macapá, Maceió, Manaus, Maringá, Montes Claros, Natal, Pelotas, Petrolina, Piracicaba, Ponta Grossa, Pôrto Alegre, Pôrto Velho, Recife, Ribeirão Preto, Rio Branco, Rio de Janeiro, Salvador, São José do Rio Preto, São José dos Campos, São Paulo, Sorocaba, Teresina, Uberaba, Uberlândia, Vale do Aço, Volta Redonda)
Bulgaria (Plovdiv, Sofia, Varna)
Burkina Faso (Bobo-Dioulasso, Ouagadougou)
Burundi (Bujumbura)
Cambodia (Phnum Pénh (Phnom Penh))
Cameroon (Bafoussam, Bamenda, Douala, Loum, Mbouda, Yaoundé)
Canada (Calgary, Edmonton, Halifax, Hamilton, Kitchener, London, Montréal, Oshawa, Ottawa-Gatineau, Québec, St. Catharines-Niagara, Toronto, Vancouver, Victoria, Windsor, Winnipeg)
Central African Republic (Bangui)
Chad (N'Djaména)
Chile (Antofagasta, Concepción, Iquique, La Serena-Coquimbo, Santiago, Temuco, Valparaíso)
China (Akesu, Ankang, Anqing, Anqiu, Anshan, Anshun, Anyang, Baicheng, Baishan, Baiyin, Baoding, Baoji, Baotou, Bayannaoer, Bazhong, Beihai, Beijing, Bengbu, Benxi, Bijie, Binzhou, Botou, Bozhou, Cangzhou, Cenxi, Changchun, Changde, Changge, Changji, Changning, Changsha, Changshu, Changyi, Changzhi, "Changzhou, Jiangsu", Chaohu, Chaoyang, Chaozhou, Chengde, Chengdu, Chenzhou, Chifeng, Chizhou, Chongqing, Chuxiong, Chuzhou, Cixi, Dafeng, Dali, Dalian, Dandong, Danyang, Daqing, Dashiqiao, Datong, Daye, Dazhou, Dengfeng, Dengzhou, Deyang, Dezhou, Donggang, Dongguan, Dongtai, Dongyang, Dongying, Dujiangyan, Enshi, Erduosi

(Ordoss), Ezhou, Fangchenggang, Feicheng, Fengcheng, Foshan, Fuan, Fuqing, "Fushun, Liaoning", Fuxin, Fuyang, Fuyang, "Fuzhou, Fujian", "Fuzhou, Jiangxi", Ganzhou, Gaoan, Gaocheng, Gaomi, Gaoyou, Gaozhou, Gongyi, Gongzhuling, Guang'an, Guangyuan, "Guangzhou, Guangdong", Guigang, Guilin, Guiping, Guiyang, Haerbin, Haicheng, Haikou, Haimen, Haining, Hami, Hanchuan, Handan, Hangzhou, Hanzhong, Hebi, Hefei, Hegang, Hejian, Hengshui, Hengyang, Heshan, Heyuan, Heze, Hezhou, Hohhot, Hsinchu, Huai'an, Huaibei, Huaihua, Huainan, Huangshan, Huangshi, Huizhou, Huludao, Huzhou, Jiamusi, "Ji'an, Jiangxi", Jiangmen, Jiangyin, Jiansang, Jiaozhou, Jiaozuo, Jiaying, Jieyang, Jilin, Jimo, "Ji'nan, Shandong", Jincheng, Jingdezhen, Jingjiang, Jingmen, "Jingzhou, Hubei", Jinhua, "Jining, Shandong", Jinjiang, Jinzhong, Jinzhou, Jiujiang, "Jixi, Heilongjiang", Jiyuan, Jurong, Kaifeng, Kaili, Kaiping, Kaohsiung, Keelung, Kelamayi, Kuerle, Kunming, Kunshan, Laibin, Laiwu, Laixi, Laiyang, Laizhou, Langfang, Lanzhou, Leiyang, Leping, Leshan, Lianyungang, Liaocheng, Liaoyang, Liaoyuan, Liling, Lin'an, Linfen, Linhai, Linqing, "Linyi, Shandong", Linzhou, "Lishui, Zhejiang", Liuan, Liupanshui, Liuyang, Liuzhou, Liyang, Longhai, Longkou, Longyan, Loudi, Luoding, Luohe, Luoyang, Luzhou, Lvliang, Ma'anshan, Macheng, Maoming, Meishan, Meizhou, "Mianyang, Sichuan", Miluo, Mudanjiang, Nanchang, Nanchong, "Nanjing, Jiangsu", Nankang, Nanning, Nantong, "Nanyang, Henan", Neijiang, Ningbo, Panjin, Panzhihua, "Pingdingshan, Henan", Pingdu, Pinghu, "Pingxiang, Jiangxi", Pizhou, Pulandian, Puning, Putian, Puyang, Qianjiang, Qingdao, Qingyuan, Qingzhou, Qinhua, Qinzhou, Qiqihaer, Qitaihe, Quanzhou, Qufu, Qujing, Quzhou, Renqiu, Rizhao, Rongcheng, Ruian, Sanhe, Sanmenxia, Sanming, Sanya, Shanghai, Shangqiu, Shangrao, Shangyu, Shantou, Shanwei, Shaoguan, Shaoxing, Shaoyang, Shengzhou, Shenyang, Shenzhen, Shihezi, Shijiazhuang, Shishi, Shiyan, Shizuishan, Shouguang, Shuangyashan, Shuozhou, Sihui, Siping, Songyuan, Suihua, "Suining, Sichuan", Suizhou, Suqian, "Suzhou, Anhui", "Suzhou, Jiangsu", "Taian, Shandong", Taicang, Taichung, Tainan, Taipei, Taishan, Taixing, "Taiyuan, Shanxi", "Taizhou, Jiangsu", "Taizhou, Zhejiang", "Tangshan, Hebei", Tengzhou, Tianjin, Tianmen, Tianshui, Tieling, Tongcheng, Tongchuan, Tonghua, Tongliao, Tongling, Tongxiang, Ürümqi (Wulumqi), Wafangdian, Weifang, Weihai, Weinan, Wenling, Wenzhou, Wuchuan, Wuhai, Wuhan, "Wuhu, Anhui", Wuwei, "Wuxi, Jiangsu", Wuzhou, Xiamen, "Xi'an, Shaanxi", Xiangcheng, "Xiangtan, Hunan", Xiangyang, Xianning, Xiantao, "Xianyang, Shaanxi", Xiaogan, Xinghua, Xingning, Xingtai, Xinyang, "Xingyi, Guizhou", Xining, Xinmi, Xintai, Xinxian, Xinyang, Xinyi, Xinyi, Xinyu, Xinzheng, Xinzhou, Xuancheng, Xuchang, Xuzhou, Yanan, "Yancheng, Jiangsu", Yangjiang, Yangquan, Yangzhou, Yanji, Yanshi, Yantai, Yibin, Yichang, "Yichun, Heilongjiang", "Yichun, Jiangxi", Yinchuan, Yingde, Yingkou, Yining, Yiwu, Yixing, "Yiyang, Hunan", Yongcheng, Yongkang, Yongzhou, Yuanjiang, Yueqing, Yueyang, "Yulin, Guangxi", "Yulin, Shaanxi", Yuncheng, Yushu, Yuxi, Yuyao, Zaoyang, Zaozhuang, Zengcheng, Zhangjiagang, Zhangjiakou, Zhangqiu, Zhangye, Zhangzhou, Zhanjiang, Zhaodong, Zhaoqing, Zhaoyuan, Zhengzhou, "Zhenjiang, Jiangsu", Zhongshan, Zhongxiang, Zhokou, Zhoushan, Zhuanghe, Zhucheng, Zhuhai, Zhuji, Zhumadian, Zhuzhou, Zibo, Zigong, Ziyang, Zunyi)
China, Hong Kong SAR (Hong Kong)
China, Macao SAR (Macao)
Colombia (Armenia, Barranquilla, Bogotá, Bucaramanga, Buenaventura, Cali, Cartagena, Cúcuta, Ibagué, Manizales, Medellín, Montería, Neiva, Pasto, Pereira, Santa Marta, Valledupar, Villavicencio)
Congo (Brazzaville, Pointe-Noire)
Costa Rica (San José)
Côte d'Ivoire (Abidjan, Bouake, San Pedro)
Croatia (Zagreb)
Cuba (Camaguey, Holguin, La Habana (Havana), Santiago de Cuba)

Czech Republic (Brno, Praha (Prague))
Dem. People's Republic of Korea (Chongjin, Hamhung, P'yongyang, Sinuiju, Wonsan)
Dem. People's Republic of Korea (Bukavu, Bunia, Goma, Kananga, Kikwit, Kinshasa, Kisangani, Kolwezi, Likasi, Lubumbashi, Matadi, Mbandaka, Mbuji-Mayi, Tshikapa, Uvira)
Denmark (København (Copenhagen))
Djibouti (Djibouti)
Dominican Republic (Santiago, Santo Domingo)
Ecuador (Cuenca, Guayaquil, Quito, Santo Domingo)
Egypt (Al-Fayyum, Al-Iskandariyah (Alexandria), Al-Ismailiyah, Al-Mahallah al-Kubra, Al-Mansurah, Al-Qahirah (Cairo), As-Suways, Aswan, Asyut, Az-Zaqazig, Bur Sa'id, Kafr-ad-Dawwar, Tanta)
El Salvador (San Salvador)
Eritrea (Asmara)
Estonia (Tallinn)
Ethiopia (Addis Ababa, Mekele)
Finland (Helsinki, Tampere)
France (Avignon, Béthune, Bordeaux, Douai-Lens, Grenoble, Lille, Lyon, Marseille-Aix-en-Provence, Montpellier, Nantes, Nice-Cannes, Paris, Rennes, Rouen, Saint-Étienne, Strasbourg, Toulon, Toulouse, Tours, Valenciennes)
Gabon (Libreville)
Gambia (Banjul)
Georgia (Tbilisi)
Germany (Berlin, Bielefeld, Bochum, Bonn, Bremen, Dortmund, Dresden, Duesseldorf, Duisburg, Essen, Frankfurt am Main, Hamburg, Hannover, Karlsruhe, Köln (Cologne), Leipzig, Mannheim, Muenster (Westfalen), München (Munich), Nurenberg, Stuttgart, Wuppertal)
Ghana (Accra, Kumasi, Sekondi Takoradi, Tamale)
Greece (Athínai (Athens), Thessaloniki)
Guatemala (Ciudad de Guatemala (Guatemala City))
Guinea (Conakry, Nzérékoré)
Guinea-Bissau (Bissau)
Haiti (Port-au-Prince)
Honduras (Choloma, San Pedro Sula, Tegucigalpa)
Hungary (Budapest)
India (Agartala, Agra, Ahmadabad, Ahmadnagar, Aizawl, Ajmer, Akola, Aligarh, Allahabad, Alwar, Amravati, Amritsar, Anand, Anantapur, Asansol, Aurangabad, Baharampur, Bangalore, Bardhaman, Bareilly, Bathinda, Begusarai, Belgaum, Bellary, Bhagalpur, Bhavnagar, Bhilwara, Bhiwandi, Bhopal, Bhubaneswar, Bihar Sharif, Bijapur, Bikaner, Bilaspur, Bokaro Steel City, Brahmapur, Chandigarh, Chandrapur, Chennai (Madras), Cherthala, Coimbatore, Cuttack, Darbhanga, Davangere, Dehradun, Delhi, Dewas, Dhanbad, Dhule, Dindigul, Durgapur, Durg-Bhilainagar, English Bazar, Erode, Farrukhabad, Firozabad, Gaya, Gorakhpur, Gulbarga, Guntur, Guwahati (Gauhati), Gwalior, Habra, Hardwar, Hisar, Hosur, Hubli-Dharwad, Hyderabad, Ichalakaranji, Imphal, Indore, Jabalpur, Jaipur, Jalandhar, Jalgaon, Jalna, Jammu, Jamnagar, Jamshedpur, Jhansi, Jodhpur, Junagadh, Kadapa, Kakinada, Kannur, Kanpur, Karimnagar, Kayamkulam, Kochi (Cochin), Kolhapur, Kolkata (Calcutta), Kollam, Korba, Kota, Kottayam, Kozhikode (Calicut), Kurnool, Latur, Lucknow, Ludhiana, Madurai, Malappuram, Malegaon, Mangalore, Mathura, Maunath Bhanjan, Meerut, Moradabad, Mumbai (Bombay), Muzaffarnagar, Muzaffarpur, Mysore, Nagpur, Nanded Waghala, Nashik, Navsari, Nellore,

Nizamabad, Palakkad, Panipat, Parbhani, Patiala, Patna, Puducherry, Pune (Poona), Purnia, Raipur, Rajahmundry, Rajkot, Rampur, Ranchi, Ranipet, Raurkela, Rohtak, Roorkee, Sagar, Saharanpur, Salem, Sangali, Santipur, Satna, Shahjahanpur, Shillong, Shimoga, Siliguri, Solapur, Srinagar, Surat, Thanjavur, Thiruvananthapuram, Thoothukkudi (Tuticorin), Thrissur, Tiruchirappalli, Tirunelveli, Tirupati, Tiruppur, Tumkur, Udaipur, Ujjain, Vadodara, Varanasi (Benares), Vellore, Vijayawada, Visakhapatnam, Warangal, Yamunanagar)
Indonesia (Ambon, Balikpapan, Bandar Lampung, Bandung, Banjarmasin, Batam, Bengkulu, Bogor, Cirebon, Denpasar, Jakarta, Jambi, Makassar (Ujung Pandang), Malang, Manado, Mataram, Medan, Padang, Palembang, Pekan Baru, Pontianak, Samarinda, Semarang, Sukabumi, Surabaya, Surakarta, Tasikmalaya, Yogyakarta)
Iran (Islamic Republic of) (Ahvaz, Arak, Ardabil, Bandar Abbas, Esfahan, Eslamshahr, Gorgan, Hamadan, Karaj, Kerman, Kermanshah, Khorramabad, Malard, Mashhad, Orumiyyeh, Qazvin, Qods, Qom, Rasht, Sanandaj, Sari, Shiraz, Tabriz, Tehran, Yazd, Zahedan, Zanzan)
Iraq (Al-Basrah (Basra), Al-Mawsil (Mosul), Amara, Baaqoobah, Baghdad, Diwaniyah, Faloojah, Hillah, Irbil (Erbil), Karbala, Kirkuk, Kut, Najaf, Nasiriyah, Ramadi, Sulaimaniya)
Ireland (Dublin)
Israel (Be'er Sheva, Hefa (Haifa), Jerusalem, Tel Aviv-Yafo (Tel Aviv-Jaffa))
Italy (Bari, Barletta, Bergamo, Bologna, Brescia, Busto Arsizio, Cagliari, Caserta, Catania, Como, Florence, Genova (Genoa), Latina, Milano (Milan), Modena, Napoli (Naples), Nola, Padova, Palermo, Parma, Pescara, Reggio Emilia, Roma (Rome), Salerno, Seregno, Taranto, Torino (Turin), Treviso, Venezia, Verona, Vicenza)
Jamaica (Kingston)
Japan (Asahikawa, Chukyo M.M.A. (Nagoya), Hiroshima, Kagoshima, Kanazawa, Kinki M.M.A. (Osaka), Kitakyushu-Fukuoka M.M.A., Kumamoto, Matsuyama, Nagasaki, Naha, Niigata, Oita, Okayama, Sapporo, Sendai, Shizuoka-Hamamatsu M.M.A., Tokyo, Utsunomiya)
Jordan (Amman, Ar-Rusayfah, Irbid, Zarqa)
Kazakhstan (Aktyubinsk, Almaty, Astana, Karaganda, Pavlodar, Semipalatinsk, Shimkent, Taraz, Ust-Kamenogorsk)
Kenya (Eldoret, Mombasa, Nairobi, Nakuru)
Kuwait (Al Kuwayt (Kuwait City))
Kyrgyzstan (Bishkek)
Lao People's Democratic Republic (Vientiane)
Latvia (Riga)
Lebanon (Bayrut (Beirut))
Liberia (Monrovia)
Libya (Banghazi, Misratah, Tarabulus (Tripoli))
Lithuania (Vilnius)
Madagascar (Antananarivo, Toamasina)
Malawi (Blantyre-Limbe, Lilongwe)
Malaysia (Ipoh, Johor Bahru, Kota Bharu, Kota Kinabalu, Kuala Lumpur, Kuala Terengganu, Kuantan, Kuching, Sandakan, Seremban)
Mali (Bamako)
Mauritania (Nouakchott)
Mexico (Acapulco de Juárez, Aguascalientes, Cancún, Celaya, Chihuahua, Ciudad de México (Mexico City), Ciudad Juárez, Ciudad Obregón, Ciudad Victoria, Coatzacoalcos, Colima, Córdoba, Cuautla Morelos, Cuernavaca, Culiacán, Durango, Guadalajara, Hermosillo, Irapuato, León de los Aldamas, Matamoros, Mazatlán, Mérida, Mexicali, Minatitlán, Monclova, Monterrey, Morelia,

Nuevo Laredo, Oaxaca de Juárez, Orizaba, Pachuca de Soto, Poza Rica de Hidalgo, Puebla, Puerto Vallarta, Querétaro, Reynosa, Saltillo, San Luis Potosí, Tampico, Tehuacán, Tepic, Tijuana, Tlaxcala, Toluca de Lerdo, Torreón, Tuxtla Gutierrez, Veracruz, Villahermosa, Xalapa, Zacatecas)
Mongolia (Ulaanbaatar)
Morocco (Agadir, Dar-el-Beida (Casablanca), Fès, Kénitra, Marrakech, Meknès, Oujda, Rabat, Safi, Tanger, Tétouan)
Mozambique (Beira, Maputo, Matola, Nampula)
Myanmar (Bago, Mandalay, Mawlamyine, Monywa, Nay Pyi Taw, Yangon)
Namibia (Windhoek)
Nepal (Kathmandu, Pokhara)
Netherlands (Amsterdam, Eindhoven, Rotterdam, s-Gravenhage (The Hague), Utrecht)
New Zealand (Auckland, Christchurch, Wellington)
Nicaragua (Managua)
Niger (Niamey, Zinder)
Nigeria (Aba, Abakaliki, Abeokuta, Abuja, Ado-Ekiti, Akure, Bauchi, Benin City, Calabar, Effon Alaiye, Enugu, Gboko, Gombe, Ibadan, Ife, Igbidu, Ikorodu, Ilorin, Jos, Kaduna, Kano, Katsina, Lagos, Lokoja, Maiduguri, Makurdi, Minna, Nnewi, Ogbomosho, Okene, Okpogho, Ondo, Onitsha, Oshogbo, Owerri, Oyo, Port Harcourt, Sokoto, Umuahia, Uyo, Warri, Zaria)
Norway (Oslo)
Oman (Masqat (Muscat))
Pakistan (Bahawalpur, Dera Ghazikhan, Faisalabad, Gujranwala, Gujrat, Hyderabad, Islamabad, Jhang, Karachi, Kasur, Lahore, Larkana, Mardan, Multan, Nawabshah, Okara, Peshawar, Quetta, Rahim Yar Khan, Rawalpindi, Sargodha, Sheikhupura, Sialkot, Sukkur, Wah)
Panama (Ciudad de Panamá (Panama City))
Papua New Guinea (Port Moresby)
Paraguay (Asunción, Ciudad del Este)
Peru (Arequipa, Chiclayo, Chimbote, Cusco, Huancayo, Iquitos, Lima, Piura, Trujillo)
Philippines (Angeles City, Bacolod, Baguio City, Basilan City (including City of Isabela), Batangas City, Butuan, Cagayan de Oro City, Cebu City, Cotabato, Davao City, General Santos City, Iligan, Iloilo City, Lapu-Lapu City, Lipa City, Mandaue City, Manila, Zamboanga City)
Poland (Bydgoszcz, Gdansk, Katowice, Kraków (Cracow), Łódź, Lublin, Poznan, Szczecin, Warszawa (Warsaw), Wrocław)
Portugal (Lisboa (Lisbon), Porto)
Puerto Rico (Aguadilla-Isabela-San Sebastian, San Juan)
Qatar (Ad-Dawhah (Doha), Ar-Rayyan)
Republic of Korea (Ansan, Anyang, Bucheon, Busan, Changwon, Cheonan, Cheongju, Daegu, Daejeon, Gimhae, Goyang, Gumi, Gwangju, Gwangmyeong, Incheon, Jeju, Jeonju, Pohang, Seongnam, Seoul, Siheung, Suwon, Uijeongbu, Ulsan, Yongin)
Republic of Moldova (Chisinau)
Romania (Bucuresti (Bucharest), Cluj-Napoca, Timisoara)
Russian Federation (Arkhangelsk, Astrakhan, Barnaul, Belgorod, Bryansk, Cheboksary, Chelyabinsk, Cherepovets, Chita, Irkutsk, Ivanovo, Izhevsk, "Kaliningrad, Kaliningrad Oblast", Kaluga, Kazan, Kemerovo, Khabarovsk, Kirov, Krasnodar, Krasnoyarsk, Kurgan, Kursk, Lipetsk, Magnitogorsk, Makhachkala, Moskva (Moscow), Naberezhnye Tselny, Nizhniy Novgorod, Nizhny Tagil, Novokuznetsk, Novosibirsk, Omsk, Orel, Orenburg, Penza, Perm, Rostov-na-Donu (Rostov-on-Don), Ryazan, Samara, Sankt Peterburg (Saint Petersburg), Saratov, Smolensk, Sochi, Stavropol, Surgut, Tolyatti, Tomsk, Tula, Tver, Tyumen, Ufa, Ulan-Ude, Ulyanovsk, Vladikavkaz,

Vladimir, Vladivostok, Volgograd, Vologda, Volzhsky, Voronezh, Yakutsk, Yaroslavl, Yekaterinburg)
Rwanda (Kigali)
Saudi Arabia (Ad-Dammam, Al-Madinah (Medina), Ar-Riyadh (Riyadh), Buraydah, Hafar al-Batin, Ha'il, Hufuf-Mubarratz, Jiddah, Jubayl, Khamis Mushayt, Makkah (Mecca), Najran, Tabuk, Taif)
Senegal (Dakar)
Serbia (Beograd (Belgrade))
Sierra Leone (Freetown)
Singapore (Singapore)
Slovakia (Bratislava)
Somalia (Berbera, Hargeysa, Kismaayo, Merca, Muqdisho (Mogadishu))
South Africa (Bloemfontein, Cape Town, Durban, East London, Johannesburg, Pietermaritzburg, Port Elizabeth, Pretoria, Rustenburg, Soshanguve, Vereeniging, Witbank)
South Sudan (Juba)
Spain (Alicante, Barcelona, Bilbao, Cordoba, Las Palmas Gran Canaria, Madrid, Malaga, Murcia, Palma, Sevilla, Valencia, Valladolid, Zaragoza)
Sri Lanka (Colombo)
State of Palestine (Gaza (incl. Ash Shati Camp))
Sudan (Al Gadarif, Al Obeid (Al Ubayyid), Al-Khartum (Khartoum), Kassala, Nyala, Port Sudan (Bur Sudan), Wad Medani)
Sweden (Göteborg, Stockholm)
Switzerland (Basel, Bern, Genève, Lausanne, Zürich (Zurich))
Syrian Arab Republic (Al-Hasakah, Al-Kamishli, Al-Raqqa, Deir El-Zor(Deir ez-Zor), Dimashq (Damascus), Halab (Aleppo), Hamah, Hims (Homs), Lattakia, Tartus)
Tajikistan (Dushanbe)
TFYR Macedonia (Skopje)
Thailand (Chon Buri, Hat Yai, Krung Thep (Bangkok), Lampang, Nakhon Ratchasima, Nonthaburi, Rayong, Samut Prakan, Udon Thani)
Togo (Lomé)
Tunisia (Safaqis, Tunis)
Turkey (Adana, Ankara, Antalya, Batman, Bursa, Denizli, Diyarbakir, Elazig, Erzurum, Eskisehir, Gaziantep, Gebze, Istanbul, Izmir, Izmit, Kahramanmaras, Kayseri, Konya, Malatya, Manisa, Mersin, Sakarya, Samsun, Sanliurfa, Sivas, Van)
Turkmenistan (Ashgabat, Tashauz)
Uganda (Kampala)
Ukraine (Dnipropetrovsk, Donetsk, Kharkiv, Krivoi Rog, Kyiv (Kiev), Lugansk, Lvov, Makeyevka, Mariupol, Nikolaev, Odesa, Sevastopol, Simferopol, Vinnitsa, Zaporizhzhya)
United Arab Emirates (Abu Zaby (Abu Dhabi), Ajman, Al-Ain, Dubayy (Dubai), Sharjah)
United Kingdom (Belfast, Birkenhead, Birmingham (West Midlands), Bournemouth/Poole, Brighton-Worthing-Littlehampton, Bristol, Cardiff, Coventry-Bedworth, Edinburgh, Glasgow, Kingston upon Hull, Leicester, Liverpool, London, Manchester, Newcastle upon Tyne, Newport, Nottingham, Preston, Reading-Wokingham, Sheffield, Southampton/Portsmouth (South Hampshire), Southend-On-Sea, Stoke-on-Trent (The Potteries), Sunderland, Swansea, Teeside (Middlesbrough), West Yorkshire)
United Republic of Tanzania (Arusha, Dar es Salaam, Mbeya, Morogoro, Mwanza, Zanzibar)
United States of America (Akron, Albany, Albuquerque, Allentown-Bethlehem, Ann Arbor, Antioch, Asheville, Atlanta, Augusta-Richmond County, Austin, Bakersfield, Baltimore, Baton

Rouge, Birmingham, Boise City, Bonita Springs-Naples, Boston, Bridgeport-Stamford, Buffalo, Cape Coral, Charleston-North Charleston, Charlotte, Chattanooga, Chicago, Cincinnati, Cleveland, Colorado Springs, "Columbia, South Carolina", "Columbus, Ohio", Concord, Corpus Christi, Dallas-Fort Worth, Dayton, Daytona Beach-Port Orange, Denton-Lewisville, Denver-Aurora, Des Moines, Detroit, Durham, El Paso, Fayetteville, Fayetteville-Springdale, Flint, Fort Wayne, Fresno, Grand Rapids, Greensboro, Greenville, Harrisburg, Hartford, Honolulu, Houston, Huntsville, Indianapolis, Indio-Cathedral City-Palm Springs, "Jackson, Mississippi", "Jacksonville, Florida", Kansas City, Kissimmee, Knoxville, Lancaster, Lancaster-Palmdale, Lansing, Las Vegas, Lexington-Fayette, Little Rock, Los Angeles-Long Beach-Santa Ana, Louisville, Madison, McAllen, Memphis, Miami, Milwaukee, Minneapolis-St. Paul, Mission Viejo, Mobile, Modesto, Nashville-Davidson, New Haven, New Orleans, New York-Newark, Ogden-Layton, Oklahoma City, Omaha, Orlando, Oxnard, Palm Bay-Melbourne, Pensacola, Philadelphia, Phoenix-Mesa, Pittsburgh, Port St. Lucie, Portland, Poughkeepsie-Newburgh, Providence, Provo-Orem, Raleigh, Reno, Richmond, Riverside-San Bernardino, Rochester, Rockford, Round Lake Beach-McHenry-Grayslake, Sacramento, Salt Lake City, San Antonio, San Diego, San Francisco-Oakland, San Jose, Santa Clarita, Santa Rosa, Sarasota-Bradenton, Scranton, Seattle, Shreveport, Spokane, "Springfield, Massachusetts, Connecticut", "Springfield, Missouri", St. Louis, Stockton, Syracuse, Tampa-St. Petersburg, Temecula-Murrieta, The Woodlands, Toledo, Trenton, Tucson, Tulsa, Victorville-Hesperia-Apple Valley, Virginia Beach, "Washington, D.C.", Wichita, Winston-Salem, Worcester, Youngstown)
Uruguay (Montevideo)
Uzbekistan (Andizhan, Namangan, Samarkand, Tashkent)
Venezuela (Bolivarian Republic of) (Acarigua-Aruare, Barcelona-Puerto La Cruz, Barinas, Barquisimeto, Cabimas, Caracas, Ciudad Bolivar, Ciudad Guayana, Cumana, El Tigre-San José de Guanipa, Guarenas-Guatire, Lagunillas, Maracaibo, Maracay, Maturin, Merida, Punto Fijo, San Cristóbal, Valencia)
Viet Nam (Bien Hoa, Can Tho, Da Nang, Hà Noi, Hai Phòng, Hue, Nha Trang, Thành Pho Ho Chí Minh (Ho Chi Minh City), Vungtau)
Yemen (Adan (Aden), Al-Hudaydah, Al-Mukalla, Ibb, Sana'a', Ta'izz)
Zambia (Kitwe, Lusaka, Ndola)
Zimbabwe (Bulawayo, Chitungwiza, Harare)