

**Table S1.** Summary of the reviewed articles related to studying UHI in HW.

| Location                   | Climate | UHI Type                       | Period                                |                                    | Method                                  | HM (K)   | Ref |
|----------------------------|---------|--------------------------------|---------------------------------------|------------------------------------|---|--|-----|
|                            |         |                                | HW days                               | Reference days                     |   |  |     |
| Singapore (Singapore)      | Af      | UHI <sub>UC</sub> <sub>L</sub> | 17–19/April/2016                      | 3–5/April/2016<br>24–26/April/2016 | In-situ measure<br>Numerical simulation | 0  | [1] |
| Cochin (India)             | Am      | UHI <sub>surf</sub>            | Data collection: April–June/2003–2016 |                                    | Remote sensing                          | –2.291 (daytime)<br>–0.411 (night)             | [2] |
| Kollam (India)             | Am      | UHI <sub>surf</sub>            | Data collection: April–June/2003–2016 |                                    | Remote sensing                          | –2.865 (daytime)<br>0 (night)<br>–1.5465       | [2] |
| Kottayam (India)           | Am      | UHI <sub>surf</sub>            | Data collection: April–June/2003–2016 |                                    | Remote sensing                          | (daytime)<br>–0.0125 (night)<br>–0.0505        | [2] |
| Thiruvananthapuram (India) | Am      | UHI <sub>surf</sub>            | Data collection: April–June/2003–2016 |                                    | Remote sensing                          | (daytime)<br>+0.1595 (night)                   | [2] |
| Thrissur (India)           | Am      | UHI <sub>surf</sub>            | Data collection: April–June/2003–2016 |                                    | Remote sensing                          | –1.027 (daytime)<br>–0.6805 (night)<br>–0.5135 | [2] |
| Tiruvalla (India)          | Am      | UHI <sub>surf</sub>            | Data collection: April–June/2003–2016 |                                    | Remote sensing                          | (daytime)<br>–0.5435 (night)                   | [2] |
| Bhiwandi (India)           | Aw      | UHI <sub>surf</sub>            | Data collection: April–June/2003–2016 |                                    | Remote sensing                          | +0.012 (daytime)<br>+0.0075 (night)<br>–0.6085 | [2] |
| Mumbai (India)             | Aw      | UHI <sub>surf</sub>            | Data collection: April–June/2003–2016 |                                    | Remote sensing                          | (daytime)<br>–0.8855 (night)                   | [2] |
| Pune (India)               | Aw      | UHI <sub>surf</sub>            | Data collection: April–June/2003–2016 |                                    | Remote sensing                          | +0.055 (daytime)<br>+0.0035 (night)<br>–1.6455 | [2] |
| Balasore (India)           | Aw      | UHI <sub>surf</sub>            | Data collection: April–June/2003–2016 |                                    | Remote sensing                          | (daytime)<br>+0.639 (night)                    | [2] |
| Bhubaneswar (India)        | Aw      | UHI <sub>surf</sub>            | Data collection: April–June/2003–2016 |                                    | Remote sensing                          | –0.063 (daytime)<br>–0.9035 (night)            | [2] |

|                       |    |                     |                                       |                |   |     |
|-----------------------|----|---------------------|---------------------------------------|----------------|---|-----|
| Bijapur (India)       | Aw | UHI <sub>surf</sub> | Data collection: April–June/2003–2016 | Remote sensing | –0.0765<br>(daytime)                    | [2] |
| Chennai (India)       | Aw | UHI <sub>surf</sub> | Data collection: April–June/2003–2016 | Remote sensing | –1.5175 (night)<br>+1.09 (daytime)      | [2] |
| Chittoor (India)      | Aw | UHI <sub>surf</sub> | Data collection: April–June/2003–2016 | Remote sensing | –0.498 (night)<br>+0.643 (daytime)      | [2] |
| Coimbatore<br>(India) | Aw | UHI <sub>surf</sub> | Data collection: April–June/2003–2016 | Remote sensing | +0.1065 (night)<br>–1.8125<br>(daytime) | [2] |
| Cuttack (India)       | Aw | UHI <sub>surf</sub> | Data collection: April–June/2003–2016 | Remote sensing | +0.487 (night)<br>–1.095 (daytime)      | [2] |
| Gulbarga (India)      | Aw | UHI <sub>surf</sub> | Data collection: April–June/2003–2016 | Remote sensing | –0.954 (night)<br>+0.2295<br>(daytime)  | [2] |
| Guntur (India)        | Aw | UHI <sub>surf</sub> | Data collection: April–June/2003–2016 | Remote sensing | –0.2075 (night)<br>–0.8265<br>(daytime) | [2] |
| Habra (India)         | Aw | UHI <sub>surf</sub> | Data collection: April–June/2003–2016 | Remote sensing | –0.163 (night)<br>–0.977 (daytime)      | [2] |
| Haldia (India)        | Aw | UHI <sub>surf</sub> | Data collection: April–June/2003–2016 | Remote sensing | +0.113 (night)<br>+0.0305<br>(daytime)  | [2] |
| Indore (India)        | Aw | UHI <sub>surf</sub> | Data collection: April–June/2003–2016 | Remote sensing | –0.703 (night)<br>–0.441 (daytime)      | [2] |
| Jamshedpur<br>(India) | Aw | UHI <sub>surf</sub> | Data collection: April–June/2003–2016 | Remote sensing | –0.4685 (night)<br>+0.4915<br>(daytime) | [2] |
| Karimnagar<br>(India) | Aw | UHI <sub>surf</sub> | Data collection: April–June/2003–2016 | Remote sensing | –0.5295 (night)<br>–1.008 (daytime)     | [2] |
| Kolkata (India)       | Aw | UHI <sub>surf</sub> | Data collection: April–June/2003–2016 | Remote sensing | –0.4865 (night)<br>–1.456 (daytime)     | [2] |
|                       |    |                     |                                       |                | –0.314 (night)                          | [2] |

|                           |     |                     |                                       |                 |   |     |
|---------------------------|-----|---------------------|---------------------------------------|-----------------|---|-----|
| Nagpur (India)            | Aw  | UHI <sub>surf</sub> | Data collection: April–June/2003–2016 | Remote sensing  | –0.5695<br>(daytime)<br>–0.368 (night)        | [2] |
| Nashik (India)            | Aw  | UHI <sub>surf</sub> | Data collection: April–June/2003–2016 | Remote sensing  | +0.084 (daytime)<br>+0.239 (night)            | [2] |
| Rourkela (India)          | Aw  | UHI <sub>surf</sub> | Data collection: April–June/2003–2016 | Remote sensing  | –0.335 (daytime)<br>+0.1485 (night)           | [2] |
| Sambalpur<br>(India)      | Aw  | UHI <sub>surf</sub> | Data collection: April–June/2003–2016 | Remote sensing  | +0.642 (daytime)<br>–0.588 (night)<br>+0.2705 | [2] |
| Surat (India)             | Aw  | UHI <sub>surf</sub> | Data collection: April–June/2003–2016 | Remote sensing  | (daytime)<br>–0.5625 (night)                  | [2] |
| Tiruchirapalli<br>(India) | Aw  | UHI <sub>surf</sub> | Data collection: April–June/2003–2016 | Remote sensing  | +0.053 (night)                                | [2] |
| Vadodara (India)          | Aw  | UHI <sub>surf</sub> | Data collection: April–June/2003–2016 | Remote sensing  | –1.036 (daytime)<br>–0.5555 (night)           | [2] |
| Vijayawada<br>(India)     | Aw  | UHI <sub>surf</sub> | Data collection: April–June/2003–2016 | Remote sensing  | –0.431 (daytime)<br>+0.078 (night)            | [2] |
| Warangal (India)          | Aw  | UHI <sub>surf</sub> | Data collection: April–June/2003–2016 | Remote sensing  | –0.182 (daytime)<br>+0.01 (night)             | [2] |
| Bengaluru (India)         | Aw  | UHI <sub>surf</sub> | Data collection: April–June/2003–2016 | Remote sensing  | –0.963 (daytime)<br>–0.258 (night)            | [2] |
| Bidar (India)             | Aw  | UHI <sub>surf</sub> | Data collection: April–June/2003–2016 | Remote sensing  | –0.429 (daytime)<br>–0.216 (night)            | [2] |
| Madurai (India)           | Aw  | UHI <sub>surf</sub> | Data collection: April–June/2003–2016 | Remote sensing  | –0.046 (night)                                | [2] |
| Nizamabad<br>(India)      | Aw  | UHI <sub>surf</sub> | Data collection: April–June/2003–2016 | Remote sensing  | –0.248 (daytime)<br>–0.3535 (night)           | [2] |
| Salem (India)             | Aw  | UHI <sub>surf</sub> | Data collection: April–June/2003–2016 | Remote sensing  | –2.028 (daytime)<br>+0.138 (night)            | [2] |
| Tirunelveli<br>(India)    | Aw  | UHI <sub>surf</sub> | Data collection: April–June/2003–2016 | Remote sensing  | –2.092 (daytime)<br>+0.3355 (night)           | [2] |
| Nicosia (Cyprus)          | BSh |                     | Data collection: 2007–2014            | In-situ measure | +0.9~1.3                                      | [3] |

|                        |     | $UHI_{uc}$<br>L | 66 or 68 or 108 days                  | summers 2007–<br>2014 | Remote sensing                                 |     |
|------------------------|-----|-----------------|---------------------------------------|-----------------------|--|-----|
| Aurangabad<br>(India)  | BSh | $UHI_{surf}$    | Data collection: April–June/2003–2016 | Remote sensing        | –0.065 (daytime)<br>+0.196 (night)<br>–0.5175  | [2] |
| Badami (India)         | BSh | $UHI_{surf}$    | Data collection: April–June/2003–2016 | Remote sensing        | (daytime)<br>+0.318 (night)                    | [2] |
| Hyderabad<br>(India)   | BSh | $UHI_{surf}$    | Data collection: April–June/2003–2016 | Remote sensing        | –0.632 (daytime)<br>+0.1745 (night)<br>–0.4335 | [2] |
| Nalgonda (India)       | BSh | $UHI_{surf}$    | Data collection: April–June/2003–2016 | Remote sensing        | (daytime)<br>+0.4145 (night)                   | [2] |
| Ahmedabad<br>(India)   | BSh | $UHI_{surf}$    | Data collection: April–June/2003–2016 | Remote sensing        | –0.319 (daytime)<br>–0.394 (night)             | [2] |
| Ambala (India)         | BSh | $UHI_{surf}$    | Data collection: April–June/2003–2016 | Remote sensing        | +0.315 (daytime)<br>+0.449 (night)<br>–0.2385  | [2] |
| Bharatpur (India)      | BSh | $UHI_{surf}$    | Data collection: April–June/2003–2016 | Remote sensing        | (daytime)<br>–1.141 (night)                    | [2] |
| Bhavnagar<br>(India)   | BSh | $UHI_{surf}$    | Data collection: April–June/2003–2016 | Remote sensing        | –0.36 (daytime)<br>–0.4935 (night)<br>+0.1295  | [2] |
| Delhi (India)          | BSh | $UHI_{surf}$    | Data collection: April–June/2003–2016 | Remote sensing        | (daytime)<br>–0.9305 (night)<br>+0.7455        | [2] |
| Faridabad (India)      | BSh | $UHI_{surf}$    | Data collection: April–June/2003–2016 | Remote sensing        | (daytime)<br>–0.437 (night)                    | [2] |
| Gandhinagar<br>(India) | BSh | $UHI_{surf}$    | Data collection: April–June/2003–2016 | Remote sensing        | +0.181 (daytime)<br>0 (night)                  | [2] |
| Gurgaon (India)        | BSh | $UHI_{surf}$    | Data collection: April–June/2003–2016 | Remote sensing        | +0.562 (daytime)<br>–0.206 (night)             | [2] |
| Gwalior (India)        | BSh | $UHI_{surf}$    | Data collection: April–June/2003–2016 | Remote sensing        | –0.5385<br>(daytime)                           | [2] |

|                           |     |                        |   |   |   |                             |
|---------------------------|-----|------------------------|---|---|---|-----------------------------|
| Junagadh (India)          | BSh | UHI <sub>surf</sub>    | Data collection: April–June/2003–2016                         | Remote sensing                          | –0.9915 (night)<br>+0.087 (daytime)<br>–0.471 (night) | [2]                         |
| Kota (India)              | BSh | UHI <sub>surf</sub>    | Data collection: April–June/2003–2016                         | Remote sensing                          | –0.24 (daytime)<br>–0.087 (night)<br>–0.2685          | [2]                         |
| Kurnool (India)           | BSh | UHI <sub>surf</sub>    | Data collection: April–June/2003–2016                         | Remote sensing                          | (daytime)<br>–0.6225 (night)<br>–0.0525               | [2]                         |
| Rajkot (India)            | BSh | UHI <sub>surf</sub>    | Data collection: April–June/2003–2016                         | Remote sensing                          | (daytime)<br>–0.241 (night)<br>–0.2155                | [2]                         |
| Ajmer (India)             | BSh | UHI <sub>surf</sub>    | Data collection: April–June/2003–2016                         | Remote sensing                          | (daytime)<br>–0.8 (night)                             | [2]                         |
| Jaipur (India)            | BSh | UHI <sub>surf</sub>    | Data collection: April–June/2003–2016                         | Remote sensing                          | –0.211 (daytime)<br>–0.668 (night)                    | [2]                         |
| Udaipur (India)           | BSh | UHI <sub>surf</sub>    | Data collection: April–June/2003–2016                         | Remote sensing                          | –0.237 (daytime)<br>–0.446 (night)                    | [2]                         |
| Palma-di-Mallorca (Spain) | BSk | UHI <sub>surf</sub>    | July/2006      June–August/2000–2013                          | Remote sensing                          | +0.11   | [4]                         |
| Karachi (Pakistan)        | BWh | UHI <sub>UC</sub><br>L | 17–24/June/2015      1/April–16/June/2015<br>25–30/June/2015  | In-situ measure                         | +   | [5]                         |
| Phoenix (USA)             | BWh | UHI <sub>UC</sub><br>L | 21–24/July/2006      15–20&25–31/July/2006<br>1–6/August/2006 | In-situ measure<br>Numerical simulation | +   | [6]                         |
| Bikaner (India)           | BWh | UHI <sub>surf</sub>    | Data collection: April–June/2003–2016                         | Remote sensing                          | +0.864 (daytime)<br>–0.5325 (night)                   | [2]                         |
| Jodhpur (India)           | BWh | UHI <sub>surf</sub>    | Data collection: April–June/2003–2016                         | Remote sensing                          | –0.202 (daytime)<br>–0.467 (night)                    | [2]                         |
| Sydney (Australia)        | Cfa | UHI <sub>UC</sub><br>L | 9–11/February/2017      13–15/February/2017                   | In-situ measure                         | –8 (daytime)<br>0 (night)                             | <b>[Err<br/>or!<br/>Ref</b> |

|                               |     |                        |   |                                    |   |                            | ere<br>nce<br>sour<br>ce<br>not<br>fou<br>nd.] |
|-------------------------------|-----|------------------------|---|------------------------------------|---|----------------------------|--|
| Szeged<br>(Hungary)           | Cfa | UHI <sub>UC</sub><br>L | Data collection: summers 2014–2018<br>30/July–<br>3/August/2017                     | 30/July–<br>3/August/2014          | In-situ measure                         | +                          | [8]  |
| Milan (Italy)                 | Cfa | UHI <sub>UC</sub><br>L | 14–23/July/2015   | 14–23/July/2014                    | Numerical simulation                    | –0.5 (night)<br>+(daytime) | [9]  |
| Milan (Italy)                 | Cfa | UHI <sub>surf</sub>    | July/2006   | June–<br>August/2000–2013          | Remote sensing                          | +0.34                      | [4]  |
| Ancona (Italy)                | Cfa | UHI <sub>surf</sub>    | July/2006   | June–<br>August/2000–2013          | Remote sensing                          | +0.41                      | [4]  |
| Shanghai (China<br>Mainland)  | Cfa | UHI <sub>UC</sub><br>L | 100 days (2013–<br>2018)  | 272 days (2013–<br>2018)           | In-situ measure                         | +                          | [10]   |
| Shanghai (China<br>Mainland)  | Cfa | UHI <sub>UC</sub><br>L | Data collection: June–August/2013–<br>2015  |                                    | In-situ measure                         | +0.9                       | [11]   |
| Guangzhou<br>(China Mainland) | Cfa | UHI <sub>UC</sub><br>L | Data collection: June–August/2013–<br>2015  |                                    | In-situ measure                         | +0.8                       | [11]   |
| New York City<br>(USA)        | Cfa | UHI <sub>UC</sub><br>L | 1–3/August/2006   | 15–31/July/2006<br>4–6/August/2006 | In-situ measure<br>Numerical simulation | +                          | [6]  |
| New York City<br>(USA)        | Cfa | UHI <sub>UC</sub><br>L | 4–8/July/2010   | 9–11/July/2010                     | Numerical simulation                    | +                          | [12]   |
| New York City<br>(USA)        | Cfa | UHI <sub>UC</sub><br>L | HW days data collection: July 2016<br>Reference days data collection: 2005–<br>2014 |                                    | In-situ measure<br>Remote sensing       | +2~3                       | [13]   |
| New York City<br>(USA)        | Cfa | UHI <sub>UC</sub><br>L | Data collection: July–August/2006<br>HW: 17–19/July/2006, 1–3/August/2006           |                                    | Numerical simulation                    | +1.5                       | [14]   |
| New York City<br>(USA)        | Cfa | UHI <sub>UC</sub><br>L | 16–18/July/2006<br>1–3/August/2006  | 13–15&19–31/July<br>/2006          | Numerical simulation                    | +2                         | [15]   |

|                           |     |   |  |  |   |        |      |
|---------------------------|-----|---|--|--|---|--------|------|
| Washington D.C<br>(USA)   | Cfa | UHI <sub>UC</sub><br>L                        | 16–18/July/2006<br>1–3/August/2006   | 4–9/August/2006<br>13–15&19–31/July<br>/2006 | Numerical simulation                                      | +1.5~2 | [15] |
| Baltimore (USA)           | Cfa | UHI <sub>UC</sub><br>L<br>UHI <sub>surf</sub> | 7–10/June/2008   | 5–6&11–<br>14/June/2008                      | Numerical simulation<br>Remote sensing<br>In-situ measure | +      | [16] |
| Baltimore (USA)           | Cfa | UHI <sub>UC</sub><br>L                        | 16–18/July/2006<br>1–3/August/2006   | 13–15&19–31/July<br>/2006<br>4–9/August/2006 | Numerical simulation                                      | +1.5~2 | [15] |
| Philadelphia<br>(USA)     | Cfa | UHI <sub>UC</sub><br>L                        | 16–18/July/2006<br>1–3/August/2006   | 13–15&19–31/July<br>/2006<br>4–9/August/2006 | Numerical simulation                                      | 0      | [15] |
| Bridgeport (USA)          | Cfa | UHI <sub>UC</sub><br>L                        | 16–18/July/2006<br>1–3/August/2006   | 13–15&19–31/July<br>/2006<br>4–9/August/2006 | Numerical simulation                                      | 0      | [15] |
| Harrisburg (USA)          | Cfa | UHI <sub>UC</sub><br>L                        | 16–18/July/2006<br>1–3/August/2006   | 13–15&19–31/July<br>/2006<br>4–9/August/2006 | Numerical simulation                                      | 0      | [15] |
| Atlanta (USA)             | Cfa | UHI <sub>UC</sub><br>L                        | Data collection: June–August/1984–<br>2007                                   |  | Numerical simulation<br>In-situ measure                   | +      | [17] |
| Oklahoma City<br>(USA)    | Cfa | UHI <sub>UC</sub><br>L                        | 31/July–<br>5/August/2008  | 15–30/July/2008<br>6–15/August/2008          | In-situ measure   | 0      | [18] |
| Bucuresti<br>(Romania)    | Cfa | UHI <sub>surf</sub>                           | July/2006  | June–August/2000–<br>2013                    | Remote sensing  | +0.10  | [4]  |
| Craiova<br>(Romania)      | Cfa | UHI <sub>surf</sub>                           | July/2006  | June–August/2000–<br>2013                    | Remote sensing  | +0.15  | [4]  |
| Taipei (Taiwan<br>Region) | Cfa | UHI <sub>surf</sub>                           | 23/July/2000, 22/July/2002,<br>21/July/2004, 22/July/2007 and<br>3/July/2010 |  | Remote sensing  | +      | [19] |
| Yilan (Taiwan<br>Region)  | Cfa | UHI <sub>surf</sub>                           | 23/July/2000, 22/July/2002,<br>21/July/2004, 22/July/2007 and<br>3/July/2010 |  | Remote sensing  | +      | [20] |

|                      |     |                        |  |                           |   |                          |      |
|----------------------|-----|------------------------|--|---------------------------|---|--------------------------|------|
| Varanasi (India)     | Cfa | UHI <sub>surf</sub>    | Data collection: April–June/2003–2016                        |                           | Remote sensing                          | -                        | [2]  |
| Jhansi (India)       | Cfa | UHI <sub>surf</sub>    | Data collection: April–June/2003–2016                        |                           | Remote sensing                          | + (daytime)<br>– (night) | [2]  |
| Dijon (France)       | Cfb | UHI <sub>UC</sub><br>L | Data collection: 6/June/2014–<br>29/July/2019<br>HW days: 53 |                           | In-situ measure                         | –                        | [21] |
| Bordeaux<br>(France) | Cfb | UHI <sub>surf</sub>    | July/2006  | June–<br>August/2000–2013 | Remote sensing                          | –0.15                    | [4]  |
| Grenoble (France)    | Cfb | UHI <sub>surf</sub>    | July/2006  | June–<br>August/2000–2013 | Remote sensing                          | +0.16                    | [4]  |
| Lille (France)       | Cfb | UHI <sub>surf</sub>    | July/2006  | June–<br>August/2000–2013 | Remote sensing                          | +0.86                    | [4]  |
| Limoges (France)     | Cfb | UHI <sub>surf</sub>    | July/2006  | June–<br>August/2000–2013 | Remote sensing                          | +0.36                    | [4]  |
| Lyon (France)        | Cfb | UHI <sub>surf</sub>    | July/2006  | June–<br>August/2000–2013 | Remote sensing                          | +0.18                    | [4]  |
| Orleans (France)     | Cfb | UHI <sub>surf</sub>    | July/2006  | June–<br>August/2000–2013 | Remote sensing                          | +0.35                    | [4]  |
| Paris (France)       | Cfb | UHI <sub>surf</sub>    | July/2006  | June–<br>August/2000–2013 | Remote sensing                          | +0.46                    | [4]  |
| Paris (France)       | Cfb | UHI <sub>UC</sub><br>L | Data collection: 1/May–<br>30/September/2003                 |                           | Numerical simulation<br>In-situ measure | +                        | [22] |
| Poitiers (France)    | Cfb | UHI <sub>surf</sub>    | July/2006  | June–<br>August/2000–2013 | Remote sensing                          | +0.32                    | [4]  |
| Rouen (France)       | Cfb | UHI <sub>surf</sub>    | July/2006  | June–<br>August/2000–2013 | Remote sensing                          | +0.80                    | [4]  |
| Toulouse<br>(France) | Cfb | UHI <sub>surf</sub>    | July/2006  | June–<br>August/2000–2013 | Remote sensing                          | +0.32                    | [4]  |
| Tours (France)       | Cfb | UHI <sub>surf</sub>    | July/2006  | June–<br>August/2000–2013 | Remote sensing                          | +0.66                    | [4]  |
| Reading (UK)         | Cfb | UHI <sub>UC</sub><br>L | Data collection: June–August/2001–<br>2017                   |                           | In-situ measure                         | +1                       | [23] |



|                       |     |                        | 14 periods/2001–<br>2017  | July/2007–2017            |                 |   |      |
|-----------------------|-----|------------------------|---|---------------------------|-----------------|---|------|
| Birmingham (UK)       | Cfb | UHI <sub>surf</sub>    | July/2006   | June–<br>August/2000–2013 | Remote sensing  | +0.76                                       | [4]  |
| Birmingham (UK)       | Cfb | UHI <sub>surf</sub>    | 18/July/2006  | June–<br>August/2003–2009 | Remote sensing  | +   | [24] |
| Cardiff (UK)          | Cfb | UHI <sub>surf</sub>    | July/2006   | June–<br>August/2000–2013 | Remote sensing  | +0.58                                       | [4]  |
| Edinburgh (UK)        | Cfb | UHI <sub>surf</sub>    | July/2006   | June–<br>August/2000–2013 | Remote sensing  | +0.67                                       | [4]  |
| Glasgow (UK)          | Cfb | UHI <sub>surf</sub>    | July/2006   | June–<br>August/2000–2013 | Remote sensing  | +0.10                                       | [4]  |
| Leicester (UK)        | Cfb | UHI <sub>surf</sub>    | July/2006   | June–<br>August/2000–2013 | Remote sensing  | +0.42                                       | [4]  |
| Liverpool (UK)        | Cfb | UHI <sub>surf</sub>    | July/2006   | June–<br>August/2000–2013 | Remote sensing  | +0.55                                       | [4]  |
| London (UK)           | Cfb | UHI <sub>surf</sub>    | July/2006   | June–<br>August/2000–2013 | Remote sensing  | +0.67                                       | [4]  |
| Sheffield (UK)        | Cfb | UHI <sub>surf</sub>    | July/2006   | June–<br>August/2000–2013 | Remote sensing  | +1.05                                       | [4]  |
| Stoke-on-trent (UK)   | Cfb | UHI <sub>surf</sub>    | July/2006   | June–<br>August/2000–2013 | Remote sensing  | +0.28                                       | [4]  |
| Wolver-hampton (UK)   | Cfb | UHI <sub>surf</sub>    | July/2006   | June–<br>August/2000–2013 | Remote sensing  | +0.47                                       | [4]  |
| Melbourne (Australia) | Cfb | UHI <sub>UC</sub><br>L | Data collection: November–<br>March/January 1995–March 2014<br>Data collection: June–August/2001–<br>2015 |                           | In-situ measure | +1.4  | [25] |
| Cluj-Napoca (Romania) | Cfb | UHI <sub>surf</sub>    | HW days: 7&23/July/2015,<br>8/August/2015   |                           | Remote sensing  | + (extremely<br>severe HW)<br>0 (severe HW) | [26] |
| Cluj-Napoca (Romania) | Cfb | UHI <sub>surf</sub>    | July/2006   | June–<br>August/2000–2013 | Remote sensing  | +0.30                                       | [4]  |

|                            |     |                     |           |                           |                |       |     |
|----------------------------|-----|---------------------|-----------|---------------------------|----------------|-------|-----|
| Apeldoorn<br>(Netherlands) | Cfb | UHI <sub>surf</sub> | July/2006 | June–<br>August/2000–2013 | Remote sensing | +0.99 | [4] |
| Rotterdam<br>(Netherlands) | Cfb | UHI <sub>surf</sub> | July/2006 | June–<br>August/2000–2013 | Remote sensing | +0.83 | [4] |
| Berlin (Germany)           | Cfb | UHI <sub>surf</sub> | July/2006 | June–<br>August/2000–2013 | Remote sensing | +0.81 | [4] |
| Darmstadt<br>(Germany)     | Cfb | UHI <sub>surf</sub> | July/2006 | June–August/2000–<br>2013 | Remote sensing | +0.32 | [4] |
| Dresden<br>(Germany)       | Cfb | UHI <sub>surf</sub> | July/2006 | June–<br>August/2000–2013 | Remote sensing | +0.61 | [4] |
| Erfurt (Germany)           | Cfb | UHI <sub>surf</sub> | July/2006 | June–<br>August/2000–2013 | Remote sensing | +0.75 | [4] |
| Freiburg iB<br>(Germany)   | Cfb | UHI <sub>surf</sub> | July/2006 | June–<br>August/2000–2013 | Remote sensing | +0.71 | [4] |
| Hamburg<br>(Germany)       | Cfb | UHI <sub>surf</sub> | July/2006 | June–<br>August/2000–2013 | Remote sensing | +0.96 | [4] |
| Hannover<br>(Germany)      | Cfb | UHI <sub>surf</sub> | July/2006 | June–<br>August/2000–2013 | Remote sensing | +0.49 | [4] |
| Koln (Germany)             | Cfb | UHI <sub>surf</sub> | July/2006 | June–<br>August/2000–2013 | Remote sensing | +0.60 | [4] |
| Leipzig<br>(Germany)       | Cfb | UHI <sub>surf</sub> | July/2006 | June–<br>August/2000–2013 | Remote sensing | +0.51 | [4] |
| Munchen<br>(Germany)       | Cfb | UHI <sub>surf</sub> | July/2006 | June–<br>August/2000–2013 | Remote sensing | +0.35 | [4] |
| Nurnberg<br>(Germany)      | Cfb | UHI <sub>surf</sub> | July/2006 | June–<br>August/2000–2013 | Remote sensing | +0.26 | [4] |
| Stuttgart<br>(Germany)     | Cfb | UHI <sub>surf</sub> | July/2006 | June–August/2000–<br>2013 | Remote sensing | +0.21 | [4] |
| Trier (Germany)            | Cfb | UHI <sub>surf</sub> | July/2006 | June–August/2000–<br>2013 | Remote sensing | +0.57 | [4] |
| Wuppertal<br>(Germany)     | Cfb | UHI <sub>surf</sub> | July/2006 | June–<br>August/2000–2013 | Remote sensing | +0.56 | [4] |

|                        |     |                                |                            |                       |   |       |      |
|------------------------|-----|--------------------------------|----------------------------|-----------------------|---|-------|------|
| Bydgoszcz (Poland)     | Cfb | UHI <sub>surf</sub>            | July/2006                  | June–August/2000–2013 | Remote sensing                          | +0.75 | [4]  |
| Kalisz (Poland)        | Cfb | UHI <sub>surf</sub>            | July/2006                  | June–August/2000–2013 | Remote sensing                          | +0.19 | [4]  |
| Krakow (Poland)        | Cfb | UHI <sub>surf</sub>            | July/2006                  | June–August/2000–2013 | Remote sensing                          | +0.56 | [4]  |
| Olsztyn (Poland)       | Cfb | UHI <sub>surf</sub>            | July/2006                  | June–August/2000–2013 | Remote sensing                          | +0.37 | [4]  |
| Poznan (Poland)        | Cfb | UHI <sub>surf</sub>            | July/2006                  | June–August/2000–2013 | Remote sensing                          | +0.74 | [4]  |
| Szczecin (Poland)      | Cfb | UHI <sub>surf</sub>            | July/2006                  | June–August/2000–2013 | Remote sensing                          | +1.05 | [4]  |
| Warszawa (Poland)      | Cfb | UHI <sub>surf</sub>            | July/2006                  | June–August/2000–2013 | Remote sensing                          | +0.41 | [4]  |
| Wroclaw (Poland)       | Cfb | UHI <sub>surf</sub>            | July/2006                  | June–August/2000–2013 | Remote sensing                          | +0.66 | [4]  |
| Zielona Gora (Poland)  | Cfb | UHI <sub>surf</sub>            | July/2006                  | June–August/2000–2013 | Remote sensing                          | +0.53 | [4]  |
| Goteborg (Sweden)      | Cfb | UHI <sub>surf</sub>            | July/2006                  | June–August/2000–2013 | Remote sensing                          | +1.18 | [4]  |
| Kobenhavn (Denmark)    | Cfb | UHI <sub>surf</sub>            | July/2006                  | June–August/2000–2013 | Remote sensing                          | +0.40 | [4]  |
| Namur (Belgium)        | Cfb | UHI <sub>surf</sub>            | July/2006                  | June–August/2000–2013 | Remote sensing                          | +0.53 | [4]  |
| Brussels (Belgium)     | Cfb | UHI <sub>UC</sub> <sub>L</sub> | Data collection: 1981–2010 |                       | In-situ measure<br>Numerical simulation | +     | [27] |
| Plzen (Czech Republic) | Cfb | UHI <sub>surf</sub>            | July/2006                  | June–August/2000–2013 | Remote sensing                          | +0.42 | [4]  |
| Praha (Czech Republic) | Cfb | UHI <sub>surf</sub>            | July/2006                  | June–August/2000–2013 | Remote sensing                          | +0.80 | [4]  |
| Sofia (Bulgaria)       | Cfb | UHI <sub>surf</sub>            | July/2006                  | June–August/2000–2013 | Remote sensing                          | +0.17 | [4]  |

|                         |     |   |   |                           |                                   |                          |      |
|-------------------------|-----|---|---|---------------------------|-----------------------------------|--------------------------|------|
| Wien (Austria)          | Cfb | UHI <sub>surf</sub>                           | July/2006   | June–<br>August/2000–2013 | Remote sensing                    | +0.44                    | [4]  |
| Adelaide<br>(Australia) | Csa | UHI <sub>UC</sub><br>L                        | Data collection: November–<br>March/January 1995–March 2014   |                           | In-situ measure                   | +1.2                     | [25] |
| Perth (Australia)       | Csa | UHI <sub>UC</sub><br>L                        | Data collection: November–<br>March/January 1995–March 2014   |                           | In-situ measure                   | –1.3                     | [25] |
| Lisbon (Portugal)       | Csa | UHI <sub>UC</sub><br>L                        | Data collection: June–September/2004–<br>2015<br>HW days: 49  |                           | In-situ measure                   | 0                        | [28] |
| Madrid (Spain)          | Csa | UHI <sub>surf</sub><br>UHI <sub>UC</sub><br>L | Data collection: summer 2002–2017<br>(UHI <sub>surf</sub> ), summer 1980–2017 (UHI <sub>UCL</sub> ) |                           | Remote sensing<br>In-situ measure | +                        | [29] |
| Madrid (Spain)          | Csa | UHI <sub>surf</sub>                           | July/2006   | June–<br>August/2000–2013 | Remote sensing                    | +0.18                    | [4]  |
| Barcelona (Spain)       | Csa | UHI <sub>surf</sub>                           | July/2006   | June–<br>August/2000–2013 | Remote sensing                    | +0.02                    | [4]  |
| Sevilla (Spain)         | Csa | UHI <sub>surf</sub>                           | July/2006   | June–<br>August/2000–2013 | Remote sensing                    | +0.10                    | [4]  |
| Athens (Greece)         | Csa | UHI <sub>UC</sub><br>L                        | Data collection: July–August 2012   |                           | In-situ measure<br>Remote sensing | +3.5                     | [20] |
| Athens (Greece)         | Csa | UHI <sub>UC</sub><br>L                        | Data collection: 1970–2004  |                           | In-situ measure                   | +                        | [30] |
| Irakleio (Greece)       | Csa | UHI <sub>surf</sub>                           | July/2006   | June–<br>August/2000–2013 | Remote sensing                    | +0.11                    | [4]  |
| Marseille<br>(France)   | Csa | UHI <sub>surf</sub>                           | July/2006   | June–<br>August/2000–2013 | Remote sensing                    | +0.20                    | [4]  |
| Napoli (Italy)          | Csa | UHI <sub>surf</sub>                           | July/2006   | June–<br>August/2000–2013 | Remote sensing                    | +0.16                    | [4]  |
| Roma (Italy)            | Csa | UHI <sub>surf</sub>                           | July/2006   | June–<br>August/2000–2013 | Remote sensing                    | +0.33                    | [4]  |
| Bhopal (India)          | Csa | UHI <sub>surf</sub>                           | Data collection: April–June/2003–2016   |                           | Remote sensing                    | + (daytime)<br>– (night) | [2]  |

|                         |     |                     |  |                |                          |     |
|-------------------------|-----|---------------------|--|----------------|--------------------------|-----|
| Jabalpur (India)        | Csa | UHI <sub>surf</sub> | Data collection: April–June/2003–2016  | Remote sensing | –                        | [2] |
| Oviedo (Spain)          | Csb | UHI <sub>surf</sub> | July/2006<br>June–<br>August/2000–2013 | Remote sensing | +0.11                    | [4] |
| Durgapur (India)        | Cwa | UHI <sub>surf</sub> | Data collection: April–June/2003–2016  | Remote sensing | + (daytime)<br>– (night) | [2] |
| Ranchi (India)          | Cwa | UHI <sub>surf</sub> | Data collection: April–June/2003–2016  | Remote sensing | –                        | [2] |
| Allahabad (India)       | Cwa | UHI <sub>surf</sub> | Data collection: April–June/2003–2016  | Remote sensing | + (daytime)<br>– (night) | [2] |
| Bhagalpur (India)       | Cwa | UHI <sub>surf</sub> | Data collection: April–June/2003–2016  | Remote sensing | –                        | [2] |
| Bihar_sharif<br>(India) | Cwa | UHI <sub>surf</sub> | Data collection: April–June/2003–2016  | Remote sensing | + (daytime)<br>– (night) | [2] |
| Dehradun<br>(India)     | Cwa | UHI <sub>surf</sub> | Data collection: April–June/2003–2016  | Remote sensing | + (daytime)<br>– (night) | [2] |
| Dhanbad (India)         | Cwa | UHI <sub>surf</sub> | Data collection: April–June/2003–2016  | Remote sensing | – (daytime)<br>+ (night) | [2] |
| Faizabad (India)        | Cwa | UHI <sub>surf</sub> | Data collection: April–June/2003–2016  | Remote sensing | –                        | [2] |
| Gaya (India)            | Cwa | UHI <sub>surf</sub> | Data collection: April–June/2003–2016  | Remote sensing | –                        | [2] |
| Goalpara (India)        | Cwa | UHI <sub>surf</sub> | Data collection: April–June/2003–2016  | Remote sensing | +                        | [2] |
| Guwahati (India)        | Cwa | UHI <sub>surf</sub> | Data collection: April–June/2003–2016  | Remote sensing | +                        | [2] |
| Haridwar (India)        | Cwa | UHI <sub>surf</sub> | Data collection: April–June/2003–2016  | Remote sensing | –                        | [2] |
| Kanpur (India)          | Cwa | UHI <sub>surf</sub> | Data collection: April–June/2003–2016  | Remote sensing | + (daytime)<br>– (night) | [2] |
| Lucknow (India)         | Cwa | UHI <sub>surf</sub> | Data collection: April–June/2003–2016  | Remote sensing | –                        | [2] |
| Muzaffarpur<br>(India)  | Cwa | UHI <sub>surf</sub> | Data collection: April–June/2003–2016  | Remote sensing | –                        | [2] |
| Patna (India)           | Cwa | UHI <sub>surf</sub> | Data collection: April–June/2003–2016  | Remote sensing | –                        | [2] |
| Roorkee (India)         | Cwa | UHI <sub>surf</sub> | Data collection: April–June/2003–2016  | Remote sensing | + (daytime)<br>– (night) | [2] |
| Tangla (India)          | Cwa | UHI <sub>surf</sub> | Data collection: April–June/2003–2016  | Remote sensing | +                        | [2] |
| Tinsukia (India)        | Cwa | UHI <sub>surf</sub> | Data collection: April–June/2003–2016  | Remote sensing | +                        | [2] |
| Amritsar (India)        | Cwa | UHI <sub>surf</sub> | Data collection: April–June/2003–2016  | Remote sensing | –                        | [2] |
| Jalandhar (India)       | Cwa | UHI <sub>surf</sub> | Data collection: April–June/2003–2016  | Remote sensing | + (daytime)<br>– (night) | [2] |

|                             |     |                        |  |  |   |                            |      |
|-----------------------------|-----|------------------------|--|--|---|----------------------------|------|
| Ludhiana (India)            | Cwa | UHI <sub>surf</sub>    | Data collection: April–June/2003–2016        |  | Remote sensing                          | + (daytime)<br>– (night)   | [2]  |
| Panipat (India)             | Cwa | UHI <sub>surf</sub>    | Data collection: April–June/2003–2016        |  | Remote sensing                          | + (daytime)<br>– (night)   | [2]  |
| Patiala (India)             | Cwa | UHI <sub>surf</sub>    | Data collection: April–June/2003–2016        |  | Remote sensing                          | + (daytime)<br>– (night)   | [2]  |
| Madison (USA)               | Dfa | UHI <sub>UC</sub><br>L | Data collection: summer 2012                 |  | In-situ measure                         | +                          | [31] |
| Chicago (USA)               | Dfa | UHI <sub>UC</sub><br>L | 12–15 July 1995                              |  | In-situ measure                         | 0                          | [32] |
| Rochester (USA)             | Dfa | UHI <sub>UC</sub><br>L | 16–18/July/2006<br>1–3/August/2006           | 13–15&19–31/July<br>/2006<br>4–9/August/2006 | Numerical simulation                    | 0                          | [15] |
| Budapest<br>(Hungary)       | Dfb | UHI <sub>surf</sub>    | July/2006                                    | June–<br>August/2000–2013                    | Remote sensing                          | +0.46                      | [4]  |
| Rzeszow<br>(Poland)         | Dfb | UHI <sub>surf</sub>    | July/2006                                    | June–<br>August/2000–2013                    | Remote sensing                          | +0.35                      | [4]  |
| Vilnius<br>(Lithuania)      | Dfb | UHI <sub>surf</sub>    | July/2006                                    | June–<br>August/2000–2013                    | Remote sensing                          | +0.68                      | [4]  |
| Seoul (South<br>Korea)      | Dwa | UHI <sub>UC</sub><br>L | Data collection: May–<br>September/2012&2016 |  | In-situ measure                         | +3.3 (2012)<br>+4.5 (2016) | [33] |
| Seoul (South<br>Korea)      | Dwa | UHI <sub>UC</sub><br>L | Data collection: 1962–2017<br>179 days       | 4870 days (June–<br>August)                  | In-situ measure                         | + 0.9                      | [34] |
| Beijing (China<br>Mainland) | Dwa | UHI <sub>UC</sub><br>L | 9–14/July/2017                               | 3–8&15–<br>20/July/2017                      | Numerical simulation<br>In-situ measure | +0.78                      | [35] |
| Beijing (China<br>Mainland) | Dwa | UHI <sub>UC</sub><br>L | 9–13/July/2017                               | 1–8&14–<br>31/July/2017                      | In-situ measure<br>Remote sensing       | +                          | [36] |
| Beijing (China<br>Mainland) | Dwa | UHI <sub>UC</sub><br>L | Data collection: June–August/2013–<br>2015   |  | In-situ measure                         | +0.9                       | [11] |
| Beijing (China<br>Mainland) | Dwa | UHI <sub>UC</sub><br>L | Data collection: 26/June–31/July/2015        |  | Numerical Simulation                    | +                          | [37] |

|                          |     |                            |   |                      |   |      |
|--------------------------|-----|----------------------------|---|----------------------|---|------|
| Beijing (China Mainland) | Dwa | $UHI_{surf}$               | Data collection: June–August/2000&2010                                    | Numerical Simulation | + | [38] |
| Beijing (China Mainland) | Dwa | $UHI_{UC}$<br><sub>L</sub> | Data collection: 2009–2010  | In-situ measure      | + | [39] |
| Beijing (China Mainland) | Dwa | $UHI_{UC}$<br><sub>L</sub> | Data collection: June–August/2009–2010<br>HW days: 44    Non-HW days: 140 | In-situ measure      | + | [40] |

**Table S2.** Summary of studies investigating energy budget changes and relevant drivers.

| City      | HM | $Q^*$   | $Q_F$  | $Q_H$   | $Q_E$   | $\Delta Q_S$ | $\Delta Q_A$ | Drivers            | Ref  |
|-----------|----|---|--|---|---|--------------|--------------|--------------------|------|
| Beijing   | +  | increase in $K \downarrow$ and $L \downarrow$ at urban site are larger than those at rural site | not measure  | urban: increase<br>rural: decrease                              | increase in $Q_E$ at urban site are smaller than that at rural site | not measure  | not consider | evapotranspiration | [39] |
| Shanghai  | +  | urban: +128 W/m <sup>2</sup><br>suburban: +115 W/m <sup>2</sup>                                 | urban: +20 W/m <sup>2</sup> (daytime)<br>suburban: +3 W/m <sup>2</sup> (daytime) | urban: +140 W/m <sup>2</sup><br>suburban: +100 W/m <sup>2</sup> | urban: - 2 W/m <sup>2</sup><br>suburban: + 2 W/m <sup>2</sup>       | not measure  | not consider | see breeze         | [10] |
| Singapore | 0  | urban: +170 W/m <sup>2</sup><br>rural: +100 W/m <sup>2</sup>                                    | assume to be unchanged   | urban: increase   | rural: increase   | no change    | not measure  | NA                 | [1]  |
| Brussel   | +  | increase  | not measure  | urban: +72 W/m <sup>2</sup><br>suburban: +55 W/m <sup>2</sup>   | increase  | increase     | not measure  | humidity           | [27] |



**Table S3.** Summary of the reviewed studies related to mitigation solutions of UHI in HWs.

| Location  | Climat<br>e | UHI Type                                  | Period  | Mitigation solution   | Temperature (K)   | Ref  |
|---|-------------|---|---|---|---|------|
| Phoenix (USA)                                       | BWh         | UHI <sub>UCL</sub>                        | 1981–2010&2041–2100                                     | Cool roof (albedo=0.88)   | –0.66   | [41] |
| Phoenix (USA)                                       | BWh         | UHI <sub>UCL</sub>                        | 27/July–6/August/2006                                   | Cool roof (albedo:<br>0.3→0.7)<br>Green roof<br>(evapotranspiration×1.5)  | –1.5  | [6]  |
| Sydney (Australia)                                  | Cfa         | UHI <sub>UCL</sub>                        | January–February/2017                                   | Irrigation  | –1.3 (Max)<br>–0.5 (Ave)  | [42] |
| Atlanta (USA)                                       | Cfa         | UHI <sub>UCL</sub>                        | 1981–2010&2041–2100                                     | Cool roof (albedo=0.88)   | –0.38   | [41] |
| Atlanta (USA)                                       | Cfa         | UHI <sub>UCL</sub>                        | 16/August/2007  | Albedo (0.15→0.3,<br>0.15→0.45)<br>Vegetation<br>Albedo + Vegetation  | 0 (double albedo)<br>–1~2 (triple albedo)<br>–7 (double<br>vegetation)<br>–1 (double albedo<br>and vegetation)<br>–1 (surface, 30%<br>green roof or cool<br>roof) | [17] |
| Baltimore–Washingt<br>on metropolitan area<br>(USA) | Cfa         | UHI <sub>UCL</sub><br>UHI <sub>surf</sub> | 7–10/June/2008  | Cool roof (Albedo:<br>0.3→0.7)<br>Green roof  | –0.5 (air, 90% green<br>roof or 95% cool<br>roof)   | [43] |
| Houston (USA)                                       | Cfa         | UHI <sub>UCL</sub>                        | 17–23/July/2011   | Albedo (roof, wall, road:<br>0.2→0.45→0.6→0.65)<br>Cool roof (albedo:<br>0.3→0.7)<br>Green roof<br>(evapotranspiration×1.5) | –3  | [44] |
| New York City<br>(USA)                              | Cfa         | UHI <sub>UCL</sub>                        | 15–31/July/2006   |   | –2.5  | [6]  |
| Kansas City (USA)                                   | Cfa         | UHI <sub>UCL</sub>                        | 16–21/July/2011<br>19–24/July/2012<br>24–30/August/2013 | Green space   | –0.5~1  | [45] |

|   |     |   |                                     |   |   |      |
|---|-----|---|-------------------------------------|---|---|------|
| Milan (Italy)                                   | Cfa | UHI <sub>UCL</sub>                        | 14–23/July/2015                     | Albedo (roof, road and wall: 0.2→0.7; only roof: 0.2→0.7)   | –2 (roof, road and wall)  | [9]  |
| Suzhou-Wuxi-Changzhou metropolitan area (China) | Cfa | UHI <sub>UCL</sub>                        | 6–8/August/2013                     | Cool roof<br>Green roof   | –2.2  | [46] |
| Nanjing (China)                                 | Cfa | UHI <sub>UCL</sub><br>UHI <sub>surf</sub> | 6–10/August/2013                    | Urban hydrological processes<br>(anthropogenic latent heat, urban oasis effect, urban irrigation, evaporation from paved surfaces, green roofs)<br>Albedo (roof: 0.15→0.8, wall: 0.25→0.45, road: 0.08→0.3)<br>Vegetation and wet areas (forest: +1400 km <sup>2</sup> , wet areas: +300 km <sup>2</sup> )<br>Vegetation watering, Pavement watering, combination of vegetation and pavement watering | –1.3 (max, air)<br>–10 (max, surface)<br><br>–1 (albedo)<br>–2~3 (albedo, vegetation and wet areas) | [47] |
| Paris (France)                                  | Cfb | UHI <sub>UCL</sub>                        | 2008&2030 based on 2003 HW          |   |   | [48] |
| Paris (France)                                  | Cfb | UHI <sub>UCL</sub>                        | HW in 2100                          |   | –0.8 (daytime)<br>–2.6 (night)  | [49] |
| Birmingham (UK)                                 | Cfb | UHI <sub>UCL</sub>                        | 2–10/August/2003<br>16–27/July/2006 | Cool roof (albedo: 0.2→0.7)   | –0.5 (Ave)<br>–3 (Max)  | [50] |
| Stuttgart (Germany)                             | Cfb | UHI <sub>UCL</sub>                        | 9–18/August/2003                    | Albedo (0.2→0.7)<br>Vegetation (12%→80%)  | –1.2 (Albedo)<br>–1.3 (Vegetation)  | [51] |
| Munich (Germany)                                | Cfb | UHI <sub>surf</sub>                       | June–August/2002–2012               | Vegetation<br>Green roof  | –<br>UHI: –3.8 (green roof)   | [52] |
| Melbourne (Australia)                           | Cfb | UHI <sub>UCL</sub><br>UHI <sub>surf</sub> | 27–30/January/2009                  | (0→30%→50%→70%→90%)   | UHI: –5.2 (cool roof)   | [53] |

|  |                   |   |  |   |   |      |
|--|-------------------|---|--|---|---|------|
|  |                   |   |  | Cool roof<br>(0.2→0.5→0.7→0.85)                               |   |      |
|  |                   |   |  | Mixed forest  | MF: -0.6~3.4 (air),<br>-0.8~4.2 (surface)                 |      |
|  |                   |   |  | Mixed forest and<br>grasslands                                | MFAG: -0.6~3.7<br>(air),                                  | [54] |
| Melbourne<br>(Australia)                               | Cfb               | UHI <sub>UCL</sub><br>UHI <sub>surf</sub> | 27–30/January/2009   | Mixed shrublands and<br>grasslands<br>(0→20%→30%→40%→50<br>%) | MSAG: -0.4~3 (air)<br>-0.8~3.7 (surface)                  |      |
| Sacramento (USA)                                       | Csa               | UHI <sub>UCL</sub>                        | 17–23/July/2011  | Albedo (roof, wall, road:<br>0.2→0.45→0.6→0.65)               | -2.5  | [44] |
| Athens (Greece)  | Csa               | UHI <sub>UCL</sub>                        | 24–26/July/2009  | Albedo  | –   | [55] |
| Terni (Italy)  | Csa               | UHI <sub>UCL</sub>                        | 17–19/July/2015  | Albedo (roof, wall, road:<br>0.2→0.8)                         | -2.5 (max)  | [56] |
| Detroit (USA)  | Dfa               | UHI <sub>UCL</sub>                        | 1981–2010&2041–2100  | Cool roof (albedo=0.88)                                       | -0.42   | [41] |
| Chicago (USA)  | Dfa               | UHI <sub>UCL</sub>                        | 17–23/July/2011  | Albedo (roof, wall, road:<br>0.2→0.45→0.6→0.65)               | -2  | [44] |
| Prague (Czech<br>Republic)                             | Dfb               | UHI <sub>UCL</sub>                        | 01/August/2017   | Albedo (+0.25, +0.5)<br>Trees (+30%)                          | -0.2 (albedo+0.25)<br>-0.5 (albedo+0.5)<br>-0.2~0 (trees) | [57] |
| Brno (Czech<br>Republic)                               | Dfb               | UHI <sub>UCL</sub>                        | 01/August/2017   | Albedo (+0.25, +0.5)<br>Trees (+30%)                          | -0.2 (albedo+0.25)<br>-0.4 (albedo+0.5)<br>-0.2~0 (trees) | [57] |
| Toronto (Canda)  | Dfb               | UHI <sub>UCL</sub><br>UHI <sub>surf</sub> | 2–5/July/2018  | Albedo (roof, wall, road:<br>0.2→0.45→0.6→0.65)               | -2 (max, air)<br>-5 (max, surface)                        | [58] |
| Montreal (Canada)                                      | Dfb               | UHI <sub>UCL</sub><br>UHI <sub>surf</sub> | 10–12/July/2005  | Albedo (roof, wall, road:<br>0.2→0.45→0.6→0.65)               | -1 (max, air)<br>-4 (max, surface)                        | [59] |
| Beijing-Tianjin-<br>Hebei metropolitan<br>area (China) | BSk<br>Cwa<br>Dwa | UHI <sub>UCL</sub>                        | 1–5/June/2001, 11–<br>16/July/2002, 20–<br>24/June/2005, 4–<br>6/July/2005, 23–<br>27/June/2009, 2–<br>6/July/2010 | White roof (albedo:<br>0.12→0.85)                             | -0.51 (Ave)<br>-0.8 (Max)                                 | [60] |

|  |             |   |  |   |                                    |      |
|--|-------------|---|--|---|------------------------------------|------|
| Beijing (China)  | Dwa         | UHI <sub>UCL</sub><br>UHI <sub>surf</sub> | 13–15/July/2002  | Cool roof (albedo:<br>0.15→0.8)             | –1~6.2 (surface)<br>–0.4~1.5 (air) | [61] |
| Beijing (China)  | Dwa         | UHI <sub>UCL</sub>                        | 1–30/July2015  | Albedo (roof, wall, road:<br>0.2→0.85)      | UHI: 2.01→1.41                     | [37] |
| Beijing (China)  | Dwa         | UHI <sub>UCL</sub>                        | 3–7/July/2010  | Green roof (0, 10%, 20%,<br>50%, 80%, 100%) | –2.5 (max)                         | [62] |
| Beijing (China), Łódź<br>(Poland), London,<br>Swindon (UK) | Dwa,<br>Cfb | UHI <sub>surf</sub>                       | June–August/2001–2002<br>or 2009–2010 or 2011–<br>2012 | Albedo<br>Vegetaion                         | –                                  | [63] |

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