

| Clinical Trial Carbon - emission factors |                                 |                                      | Default values |           |                   | Correct at 9/10/2024                            |                                                                                                                                     |
|------------------------------------------|---------------------------------|--------------------------------------|----------------|-----------|-------------------|-------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| Section                                  | Decription                      | Name                                 | Value          | Unit      | Unit reference    | Source                                          | Comments                                                                                                                            |
| Intervention                             | Interventional product          | Overage                              | 100            | %         |                   | Expert judgement                                | Where number per subject is entered a default over supply is                                                                        |
| Intervention                             | Interventional product          | IP Kit weight                        | 0.5            | kg        |                   | Expert judgement                                | Kit weight required when intervention is sourced centrally                                                                          |
| Intervention                             | Intervention waste              | Spend on intervention waste          | 10             | %         |                   | Expert judgement                                | Where spend data is used to calculate intervention impacts we assume extra 10% spend on top for waste                               |
| Intervention                             | Interventional transport        | Intervention road transport          | 1000           | km        |                   | Expert judgement                                | Where the intervention is sourced centrally assume 1000km road transport                                                            |
| Test/lab kits                            | Test/lab kits                   | Overage                              | 100            | %         |                   | Expert judgement                                | Where number per subject is entered a default over supply is                                                                        |
| Test/lab kits                            | Test/lab kits                   | Testing kit weight                   | 0.30           | kg        |                   | Guidance doc                                    | 4.1.2 Testing/diagnostic kits                                                                                                       |
| Test/lab kits                            | Test/lab kits                   | Kit road transport                   | 1000           | km        |                   | Guidance doc                                    | 4.1.2 Testing/diagnostic kits                                                                                                       |
| Test/lab kits                            | Test/lab kits                   | Spending on test kit waste           | 10             | %         |                   | Expert judgement                                |                                                                                                                                     |
| Other Subject or site                    | Devices                         | Overage                              | 100            | %         |                   | Expert judgement                                | Where number per subject is entered a default over supply is                                                                        |
| Other Subject or site                    | Devices                         | Spending on device waste             | 10             | %         |                   | Expert judgement                                |                                                                                                                                     |
| Other Subject or site                    | Devices                         | Device (smartphone) weight           | 0.187          | kg        |                   | https://www.apple.com/uk/iphone-15-pro/specs/   | iPhone 15 pro                                                                                                                       |
| Other Subject or site                    | Devices                         | Device (tablet) weight               | 0.469          | kg        |                   | https://support.apple.com/kb/SP751?locale=en_GB | 5th generation iPad                                                                                                                 |
| Subject travel                           | Transport mode                  | Aeroplane (domestic)                 | 0              | %         |                   | Assumed                                         | Percentages by transport mode                                                                                                       |
| Subject travel                           | Transport mode                  | Aeroplane (long haul)                | 0              | %         |                   | Assumed                                         | Percentages by transport mode                                                                                                       |
| Subject travel                           | Transport mode                  | Bike                                 | 0              | %         |                   | Assumed                                         | Percentages by transport mode                                                                                                       |
| Subject travel                           | Transport mode                  | Bus                                  | 0              | %         |                   | Assumed                                         | Percentages by transport mode                                                                                                       |
| Subject travel                           | Transport mode                  | Car                                  | 100            | %         |                   | Guidance doc pg 26                              | Percentages by transport mode                                                                                                       |
| Subject travel                           | Transport mode                  | Coach                                | 0              | %         |                   | Assumed                                         | Percentages by transport mode                                                                                                       |
| Subject travel                           | Transport mode                  | Light rail/tram                      | 0              | %         |                   | Assumed                                         | Percentages by transport mode                                                                                                       |
| Subject travel                           | Transport mode                  | National rail                        | 0              | %         |                   | Assumed                                         | Percentages by transport mode                                                                                                       |
| Subject travel                           | Transport mode                  | Taxi                                 | 0              | %         |                   | Assumed                                         | Percentages by transport mode                                                                                                       |
| Subject travel                           | Transport mode                  | Walk                                 | 0              | %         |                   | Assumed                                         | Percentages by transport mode                                                                                                       |
| Subject travel                           | Distance travelled              | Distance                             | 70             | km        |                   | Guidance doc pg 26                              | Average distance travelled                                                                                                          |
| Trial site staff                         | Trial site staff hours          | Staff hours uplift                   | 3              | Amount    |                   | Expert judgement                                | Uplift for staff time at site based on participant visit                                                                            |
| Trial site staff                         | Trial site staff hours          | Electricity                          | 0.664          | kWh       |                   | Guidance doc                                    | Electricity use per staff hour                                                                                                      |
| Trial site staff                         | Trial site staff hours          | Fuel                                 | 1.39           | kWh       |                   | Guidance doc                                    | Fuel use per staff hour                                                                                                             |
|                                          |                                 | Flight long haul threshold           | 7400           | km        |                   | UK Government 2023 GHG conversion factors       | Long haul flights if distance is >= 3,700km. Short haul flights if distance is < 3,700km. Multiplied by 2 to account for round trip |
| Trial site staff travel                  | Transport mode                  | Aeroplane (domestic)                 | 0              | %         |                   | Assumed                                         | Percentages by transport mode                                                                                                       |
| Trial site staff travel                  | Transport mode                  | Aeroplane (long haul)                | 0              | %         |                   | Assumed                                         | Percentages by transport mode                                                                                                       |
| Trial site staff travel                  | Transport mode                  | Bike                                 | 0              | %         |                   | Assumed                                         | Percentages by transport mode                                                                                                       |
| Trial site staff travel                  | Transport mode                  | Bus                                  | 0              | %         |                   | Assumed                                         | Percentages by transport mode                                                                                                       |
| Trial site staff travel                  | Transport mode                  | Car                                  | 100            | %         |                   | Guidance doc pg 39                              | Percentages by transport mode                                                                                                       |
| Trial site staff travel                  | Transport mode                  | Coach                                | 0              | %         |                   | Assumed                                         | Percentages by transport mode                                                                                                       |
| Trial site staff travel                  | Transport mode                  | Light rail/tram                      | 0              | %         |                   | Assumed                                         | Percentages by transport mode                                                                                                       |
| Trial site staff travel                  | Transport mode                  | National rail                        | 0              | %         |                   | Assumed                                         | Percentages by transport mode                                                                                                       |
| Trial site staff travel                  | Transport mode                  | Taxi                                 | 0              | %         |                   | Assumed                                         | Percentages by transport mode                                                                                                       |
| Trial site staff travel                  | Transport mode                  | Walk                                 | 0              | %         |                   | Assumed                                         | Percentages by transport mode                                                                                                       |
| Trial site staff travel                  | Distance travelled              | Distance                             | 50             | km        |                   | Guidance doc pg 39                              | Average distance travelled                                                                                                          |
|                                          |                                 |                                      |                |           |                   |                                                 | Total number of hours worked by staff divided by number of participant visits                                                       |
| Trial management                         | Staff time                      | Trial management staff time          | 50             | hours     | participant visit | Based on previous trials                        | Electricity per staff hour at office                                                                                                |
| Trial management                         | Staff time                      | Office electricity per staff hour    | 0.55           | kWh       |                   | Guidance doc                                    | Heat per staff hour at office                                                                                                       |
| Trial management                         | Staff time                      | Office heat per staff hour           | 0.792          | kWh       |                   | Guidance doc                                    | Assumed % unit                                                                                                                      |
| Trial management                         | Staff time                      | Proportion working from home         | 40.00          | %         |                   | Based on previous trials                        | Electricity per staff hour at home                                                                                                  |
| Trial management                         | Staff time                      | Home electricity per hour            | 0.05           | kWh       |                   | Guidance doc                                    | Heat per staff hour at home                                                                                                         |
| Trial management                         | Staff time                      | Home heat per hour                   | 0.792          | kWh       |                   | Guidance doc                                    | Percentages by transport mode                                                                                                       |
| Trial management - staff commuting       | Transport mode                  | Aeroplane (domestic)                 | 0              | %         |                   | Assumed                                         | Percentages by transport mode                                                                                                       |
| Trial management - staff commuting       | Transport mode                  | Aeroplane (long haul)                | 0              | %         |                   | Assumed                                         | Percentages by transport mode                                                                                                       |
| Trial management - staff commuting       | Transport mode                  | Bike                                 | 0              | %         |                   | Assumed                                         | Percentages by transport mode                                                                                                       |
| Trial management - staff commuting       | Transport mode                  | Bus                                  | 0              | %         |                   | Assumed                                         | Percentages by transport mode                                                                                                       |
| Trial management - staff commuting       | Transport mode                  | Car                                  | 100            | %         |                   | Guidance doc pg 42                              | Percentages by transport mode                                                                                                       |
| Trial management - staff commuting       | Transport mode                  | Coach                                | 0              | %         |                   | Assumed                                         | Percentages by transport mode                                                                                                       |
| Trial management - staff commuting       | Transport mode                  | Light rail/tram                      | 0              | %         |                   | Assumed                                         | Percentages by transport mode                                                                                                       |
| Trial management - staff commuting       | Transport mode                  | National rail                        | 0              | %         |                   | Assumed                                         | Percentages by transport mode                                                                                                       |
| Trial management - staff commuting       | Transport mode                  | Taxi                                 | 0              | %         |                   | Assumed                                         | Percentages by transport mode                                                                                                       |
| Trial management - staff commuting       | Transport mode                  | Walk                                 | 0              | %         |                   | Assumed                                         | Percentages by transport mode                                                                                                       |
| Trial management - staff commuting       | Distance travelled              | Distance                             | 50             | km        |                   | Guidance doc pg 42                              | Average distance travelled                                                                                                          |
| Trial meetings                           | Trial management                | Attendees per meeting                | 20             | attendees |                   | Based on previous trials                        | Average number of attendees per meeting                                                                                             |
| Trial meetings                           | Trial management                | Virtual attendees per meeting        | 50             | %         |                   | Based on previous trials                        | Proportion of virtual attendees per meeting                                                                                         |
| Trial meetings                           | Trial management                | International attendees per meeting  | 10             | %         |                   | Based on previous trials                        | Proportion of international attendees per meeting                                                                                   |
| Trial meetings                           | Trial management                | Local attendees per meeting          | 40             | %         |                   | Based on previous trials                        | Proportion of local attendees per meeting                                                                                           |
| Trial meetings                           | Trial management                | Virtual hours per management meeting | 3              | hours     |                   | Based on previous trials                        | Proportion of local attendees per meeting                                                                                           |
| Trial meetings                           | International travel - attendee | Air                                  | 2000           | km        | attendee          | Based on previous trials                        |                                                                                                                                     |
| Trial meetings                           | International travel - attendee | Road                                 | 100            | km        | attendee          | Based on previous trials                        |                                                                                                                                     |
| Trial meetings                           | International travel - attendee | Public transport                     | 0              | km        | attendee          | Based on previous trials                        |                                                                                                                                     |
| Trial meetings                           | International travel - attendee | Hotel stay                           | 1              | nights    | attendee          | Based on previous trials                        |                                                                                                                                     |
| Trial meetings                           | Local travel - attendee         | Air                                  | 0              | km        | attendee          | Based on previous trials                        |                                                                                                                                     |
| Trial meetings                           | Local travel - attendee         | Road                                 | 50             | km        | attendee          | Based on previous trials                        |                                                                                                                                     |
| Trial meetings                           | Local travel - attendee         | Public transport                     | 0              | km        | attendee          | Based on previous trials                        |                                                                                                                                     |
| Trial meetings                           | Local travel - attendee         | Hotel stay                           | 0              | nights    | attendee          | Based on previous trials                        |                                                                                                                                     |
| Trial meetings                           | Monitor visits                  | Monitors per meeting                 | 10             | monitors  |                   | Based on previous trials                        | Average number of monitors per meeting                                                                                              |
| Trial meetings                           | Monitor visits                  | Virtual monitors per meeting         | 50             | %         |                   | Based on previous trials                        | Proportion of virtual monitors per meeting                                                                                          |
| Trial meetings                           | Monitor visits                  | International monitors per meeting   | 40             | %         |                   | Based on previous trials                        | Proportion of international monitors per meeting                                                                                    |
| Trial meetings                           | Monitor visits                  | Local monitors per meeting           | 10             | %         |                   | Based on previous trials                        | Proportion of local monitors per meeting                                                                                            |
| Trial meetings                           | Monitor visits                  | Virtual hours per monitor meeting    | 3              | hours     |                   | Based on previous trials                        | Proportion of local attendees per meeting                                                                                           |
| Trial meetings                           | International travel - monitor  | Air                                  | 3000           | km        | monitor           | Based on previous trials                        |                                                                                                                                     |
| Trial meetings                           | International travel - monitor  | Road                                 | 100            | km        | monitor           | Based on previous trials                        |                                                                                                                                     |
| Trial meetings                           | International travel - monitor  | Public transport                     | 0              | km        | monitor           | Based on previous trials                        |                                                                                                                                     |
| Trial meetings                           | International travel - monitor  | Hotel stay                           | 1              | nights    | monitor           | Based on previous trials                        |                                                                                                                                     |
| Trial meetings                           | Local travel - monitor          | Air                                  | 0              | km        | monitor           | Based on previous trials                        |                                                                                                                                     |

| Clinical Trial Carbon - emission factors |                                     |                                           | Default values |               |                | Correct at 9/10/2024                                                                                                                                                                                                                              |                                                              |
|------------------------------------------|-------------------------------------|-------------------------------------------|----------------|---------------|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|
| Section                                  | Decription                          | Name                                      | Value          | Unit          | Unit reference | Source                                                                                                                                                                                                                                            | Comments                                                     |
| Trial meetings                           | Local travel - monitor              | Road                                      | 100            | km            | monitor        | Based on previous trials                                                                                                                                                                                                                          |                                                              |
| Trial meetings                           | Local travel - monitor              | Public transport                          | 0              | km            | monitor        | Based on previous trials                                                                                                                                                                                                                          |                                                              |
| Trial meetings                           | Local travel - monitor              | Hotel stay                                | 0              | nights        | monitor        | Based on previous trials                                                                                                                                                                                                                          |                                                              |
| Trial meetings                           | Investigator visits                 | Investigators per meeting                 | 50             | investigators |                | Based on previous trials                                                                                                                                                                                                                          | Average number of investigators per meeting                  |
| Trial meetings                           | Investigator visits                 | Virtual investigators per meeting         | 20             | %             |                | Based on previous trials                                                                                                                                                                                                                          | Proportion of virtual investigators per meeting              |
| Trial meetings                           | Investigator visits                 | International investigators per meeting   | 60             | %             |                | Based on previous trials                                                                                                                                                                                                                          | Proportion of international investigators per meeting        |
| Trial meetings                           | Investigator visits                 | Local investigators per meeting           | 20             | %             |                | Based on previous trials                                                                                                                                                                                                                          | Proportion of local investigators per meeting                |
| Trial meetings                           | Investigator visits                 | Virtual hours per investigator meeting    | 3              | hours         |                | Based on previous trials                                                                                                                                                                                                                          | Proportion of local attendees per meeting                    |
| Trial meetings                           | International travel - investigator | Air                                       | 3000           | km            | investigator   | Based on previous trials                                                                                                                                                                                                                          |                                                              |
| Trial meetings                           | International travel - investigator | Road                                      | 100            | km            | investigator   | Based on previous trials                                                                                                                                                                                                                          |                                                              |
| Trial meetings                           | International travel - investigator | Public transport                          | 0              | km            | investigator   | Based on previous trials                                                                                                                                                                                                                          |                                                              |
| Trial meetings                           | International travel - investigator | Hotel stay                                | 1              | nights        | investigator   | Based on previous trials                                                                                                                                                                                                                          |                                                              |
| Trial meetings                           | Local travel - investigator         | Air                                       | 0              | km            | investigator   | Based on previous trials                                                                                                                                                                                                                          |                                                              |
| Trial meetings                           | Local travel - investigator         | Road                                      | 100            | km            | investigator   | Based on previous trials                                                                                                                                                                                                                          |                                                              |
| Trial meetings                           | Local travel - investigator         | Public transport                          | 0              | km            | investigator   | Based on previous trials                                                                                                                                                                                                                          |                                                              |
| Trial meetings                           | Local travel - investigator         | Hotel stay                                | 0              | nights        | investigator   | Based on previous trials                                                                                                                                                                                                                          |                                                              |
| Trial meetings                           | EC meetings                         | EC attendees per meeting                  | 15             | EC attendees  |                | Based on previous trials                                                                                                                                                                                                                          | Average number of EC attendees per meeting                   |
| Trial meetings                           | EC meetings                         | Virtual EC attendees per meeting          | 20             | %             |                | Based on previous trials                                                                                                                                                                                                                          | Proportion of virtual EC attendees per meeting               |
| Trial meetings                           | EC meetings                         | International EC attendees per meeting    | 70             | %             |                | Based on previous trials                                                                                                                                                                                                                          | Proportion of international EC attendees per meeting         |
| Trial meetings                           | EC meetings                         | Local EC attendees per meeting            | 10             | %             |                | Based on previous trials                                                                                                                                                                                                                          | Proportion of local EC attendees per meeting                 |
| Trial meetings                           | EC meetings                         | Virtual hours per EC meeting              | 3              | hours         |                | Based on previous trials                                                                                                                                                                                                                          | Proportion of local attendees per meeting                    |
| Trial meetings                           | International travel - EC attendees | Air                                       | 1500           | km            | EC attendee    | Based on previous trials                                                                                                                                                                                                                          |                                                              |
| Trial meetings                           | International travel - EC attendees | Road                                      | 100            | km            | EC attendee    | Based on previous trials                                                                                                                                                                                                                          |                                                              |
| Trial meetings                           | International travel - EC attendees | Public transport                          | 0              | km            | EC attendee    | Based on previous trials                                                                                                                                                                                                                          |                                                              |
| Trial meetings                           | International travel - EC attendees | Hotel stay                                | 1              | nights        | EC attendee    | Based on previous trials                                                                                                                                                                                                                          |                                                              |
| Trial meetings                           | Local travel - EC attendees         | Air                                       | 0              | km            | EC attendee    | Based on previous trials                                                                                                                                                                                                                          |                                                              |
| Trial meetings                           | Local travel - EC attendees         | Road                                      | 100            | km            | EC attendee    | Based on previous trials                                                                                                                                                                                                                          |                                                              |
| Trial meetings                           | Local travel - EC attendees         | Public transport                          | 0              | km            | EC attendee    | Based on previous trials                                                                                                                                                                                                                          |                                                              |
| Trial meetings                           | Local travel - EC attendees         | Hotel stay                                | 0              | nights        | EC attendee    | Based on previous trials                                                                                                                                                                                                                          |                                                              |
| Trial meetings - other                   | Other meetings                      | Attendees per other meeting               | 10             | attendees     |                | Based on previous trials                                                                                                                                                                                                                          | Average number of attendees per meeting                      |
| Trial meetings - other                   | Other meetings                      | Virtual attendees per other meeting       | 50             | %             |                | Based on previous trials                                                                                                                                                                                                                          | Proportion of virtual attendees per meeting                  |
|                                          |                                     |                                           |                |               |                |                                                                                                                                                                                                                                                   |                                                              |
| Trial meetings - other                   | Other meetings                      | International attendees per other meeting | 10             | %             |                | Based on previous trials                                                                                                                                                                                                                          | Proportion of international attendees per meeting            |
| Trial meetings - other                   | Other meetings                      | Local attendees per other meeting         | 40             | %             |                | Based on previous trials                                                                                                                                                                                                                          | Proportion of local attendees per meeting                    |
| Trial meetings                           | Other meetings                      | Virtual hours per other meeting           | 3              | hours         |                | Based on previous trials                                                                                                                                                                                                                          | Proportion of local attendees per meeting                    |
| Trial meetings - other                   | International travel - other        | Air                                       | 1500           | km            | attendee       | Based on previous trials                                                                                                                                                                                                                          |                                                              |
| Trial meetings - other                   | International travel - other        | Road                                      | 100            | km            | attendee       | Based on previous trials                                                                                                                                                                                                                          |                                                              |
| Trial meetings - other                   | International travel - other        | Public transport                          | 0              | km            | attendee       | Based on previous trials                                                                                                                                                                                                                          |                                                              |
| Trial meetings - other                   | International travel - other        | Hotel stay                                | 1              | nights        | attendee       | Based on previous trials                                                                                                                                                                                                                          |                                                              |
| Trial meetings - other                   | Local travel - other                | Air                                       | 0              | km            | attendee       | Based on previous trials                                                                                                                                                                                                                          |                                                              |
| Trial meetings - other                   | Local travel - other                | Road                                      | 100            | km            | attendee       | Based on previous trials                                                                                                                                                                                                                          |                                                              |
| Trial meetings - other                   | Local travel - other                | Public transport                          | 0              | km            | attendee       | Based on previous trials                                                                                                                                                                                                                          |                                                              |
| Trial meetings - other                   | Local travel - other                | Hotel stay                                | 0              | nights        | attendee       | Based on previous trials                                                                                                                                                                                                                          |                                                              |
|                                          |                                     |                                           |                |               |                | Rizan, C, et al. The carbon footprint of products used in five common surgical operations: identifying contributing products and processes. sl : Journal of the Royal Society of Medicine. 2023;116(6):199-213. doi:10.1177/014107682311661, 2023 | Total weight including packaging                             |
| FTF visit local consumables              | Consumables                         | Syringe, 20 mL                            | 0.0166         | kg            |                | Rizan, C, et al. The carbon footprint of products used in five common surgical operations: identifying contributing products and processes. sl : Journal of the Royal Society of Medicine. 2023;116(6):199-213. doi:10.1177/014107682311661, 2023 | Total weight including packaging                             |
|                                          |                                     |                                           |                |               |                | Rizan, C, et al. The carbon footprint of products used in five common surgical operations: identifying contributing products and processes. sl : Journal of the Royal Society of Medicine. 2023;116(6):199-213. doi:10.1177/014107682311661, 2023 | Total weight including packaging                             |
| FTF visit local consumables              | Consumables                         | Needle, green, stainless steel            | 0.001          | kg            |                | Rizan, C, et al. The carbon footprint of products used in five common surgical operations: identifying contributing products and processes. sl : Journal of the Royal Society of Medicine. 2023;116(6):199-213. doi:10.1177/014107682311661, 2023 | Total weight including packaging                             |
|                                          |                                     |                                           |                |               |                | Rizan, C, et al. The carbon footprint of products used in five common surgical operations: identifying contributing products and processes. sl : Journal of the Royal Society of Medicine. 2023;116(6):199-213. doi:10.1177/014107682311661, 2023 | Total weight including packaging                             |
| FTF visit local consumables              | Consumables                         | Gloves, sterile pair                      | 0.0392         | kg            |                | Rizan, C, et al. The carbon footprint of products used in five common surgical operations: identifying contributing products and processes. sl : Journal of the Royal Society of Medicine. 2023;116(6):199-213. doi:10.1177/014107682311661, 2023 | Total weight including packaging                             |
|                                          |                                     |                                           |                |               |                | Rizan, C, et al. The carbon footprint of products used in five common surgical operations: identifying contributing products and processes. sl : Journal of the Royal Society of Medicine. 2023;116(6):199-213. doi:10.1177/014107682311661, 2023 | Total weight including packaging                             |
| FTF visit local consumables              | Consumables                         | Face mask                                 | 0.00436        | kg            |                | Rizan, C, et al. The carbon footprint of products used in five common surgical operations: identifying contributing products and processes. sl : Journal of the Royal Society of Medicine. 2023;116(6):199-213. doi:10.1177/014107682311661, 2023 | Total weight including packaging                             |
| Samples                                  | Local labs                          | Proportion of frozen samples              | 20             | %             |                | Based on previous trials                                                                                                                                                                                                                          |                                                              |
| Samples                                  | Local labs                          | Proportion of ambient samples             | 80             | %             |                | Based on previous trials                                                                                                                                                                                                                          |                                                              |
| Samples                                  | Local labs                          | Proportion of samples for local storage   | 25             | %             |                | Based on previous trials                                                                                                                                                                                                                          |                                                              |
| Samples                                  | Local labs                          | Average duration of local storage         | 5              | years         |                | Based on previous trials                                                                                                                                                                                                                          |                                                              |
| Samples                                  | Central labs                        | Proportion of frozen samples              | 50             | %             |                | Based on previous trials                                                                                                                                                                                                                          |                                                              |
| Samples                                  | Central labs                        | Proportion of ambient samples             | 50             | %             |                | Based on previous trials                                                                                                                                                                                                                          |                                                              |
| Samples                                  | Central labs                        | Number of samples per frozen shipment     | 1000           | samples       |                | Based on previous trials                                                                                                                                                                                                                          | Can be any number between 1-1000                             |
| Samples                                  | Central labs                        | Dry ice per frozen shipment               | 5              | kg            |                | Based on previous trials                                                                                                                                                                                                                          |                                                              |
|                                          |                                     |                                           |                |               |                |                                                                                                                                                                                                                                                   |                                                              |
| Samples                                  | Central labs                        | Number of samples per ambient shipment    | 500            | samples       |                | Based on previous trials                                                                                                                                                                                                                          | Can be any number between 1-500                              |
| Samples                                  | Central labs                        | Average duration of central storage       | 5              | years         |                | Based on previous trials                                                                                                                                                                                                                          |                                                              |
|                                          |                                     |                                           |                |               |                |                                                                                                                                                                                                                                                   |                                                              |
| Samples                                  | Central labs                        | Proportion of samples for central storage | 75             | %             |                | Based on previous trials                                                                                                                                                                                                                          |                                                              |
| Samples                                  | Local and central labs              | Weight of ambient shipment                | 0.2            | kg            |                | Based on previous trials                                                                                                                                                                                                                          |                                                              |
| Samples                                  | Local and central labs              | Weight of frozen shipment                 | 7.2            | kg            |                | Based on previous trials                                                                                                                                                                                                                          |                                                              |
| Samples                                  | Local and central labs              | Proportion of samples analysed            | 100            | %             |                | Based on previous trials                                                                                                                                                                                                                          |                                                              |
| Samples                                  | Local and central labs              | Sample weight                             | 0.01           | kg            |                | Based on previous trials                                                                                                                                                                                                                          |                                                              |
|                                          |                                     |                                           |                |               |                |                                                                                                                                                                                                                                                   |                                                              |
| Samples                                  | Local and central labs              | Sample road transport                     | 1000           | km            |                | Expert judgement                                                                                                                                                                                                                                  | When samples are sent centrally assume 1000km road transport |



| Section         | Activity                                | Category           | Name                                             | Type                         | Region (standardised) | GHG Emissions (standardised) | Unit (standardised)   | Unit reference | Source                                                                                                                                                                                                                      | Comments                                                                  |
|-----------------|-----------------------------------------|--------------------|--------------------------------------------------|------------------------------|-----------------------|------------------------------|-----------------------|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|
| Clinical supply | Investigational medicinal product (IMP) | Drug               | Vial, packed (2mL vial, with 10% pure substance) |                              |                       |                              | 5 kg CO2 eq           | vial           | Based on previous trials                                                                                                                                                                                                    |                                                                           |
| Clinical supply | Investigational medicinal product (IMP) | Drug               | Tablet (150 mg)                                  |                              |                       |                              | 0.2 kg CO2 eq         | tablet         | Based on previous trials using ABPI tool                                                                                                                                                                                    |                                                                           |
| Clinical supply | Investigational medicinal product (IMP) | Device             | Device (packed)                                  |                              |                       |                              | 1.245 kg CO2 eq       | device         | <a href="https://www.prescquipp.info/our-resources/bulletins/bulletin-295-inhaler-carbon-footprint/">https://www.prescquipp.info/our-resources/bulletins/bulletin-295-inhaler-carbon-footprint/</a>                         | Inhaler used as proxy for device                                          |
| Clinical supply | Investigational medicinal product (IMP) | Drug               | Drug spend                                       |                              |                       |                              | 0.031990547 kg CO2 eq | USD            | 2022 US EEIO factors <a href="https://www.epa.gov/land-research/us-environmentally-extended-input-output-useeio-models">https://www.epa.gov/land-research/us-environmentally-extended-input-output-useeio-models</a>        | Used: 325412 Pharmaceutical products (pills, powders, solutions, etc.)    |
| Clinical supply | Investigational medicinal product (IMP) | Device             | Device spend                                     |                              |                       |                              | 0.268935194 kg CO2 eq | USD            | 2022 US EEIO factors <a href="https://www.epa.gov/land-research/us-environmentally-extended-input-output-useeio-models">https://www.epa.gov/land-research/us-environmentally-extended-input-output-useeio-models</a>        | Used: 339112 Surgical and Medical Instrument Manufacturing                |
| Clinical supply | Waste                                   | Drug               | Vial (empty)                                     | Hazardous waste incineration |                       |                              | 0.04 kg CO2 eq        | vial           | Based on previous trials                                                                                                                                                                                                    |                                                                           |
| Clinical supply | Waste                                   | Drug               | Tablet packaging (per tablet)                    | Hazardous waste incineration |                       |                              | 0.01 kg CO2 eq        | tablet         | Based on previous trials                                                                                                                                                                                                    |                                                                           |
| Clinical supply | Waste                                   | Drug               | Device (per device)                              | Hazardous waste incineration |                       |                              | 1.429 kg CO2 eq       | device         | <a href="https://www.prescquipp.info/our-resources/bulletins/bulletin-295-inhaler-carbon-footprint/">https://www.prescquipp.info/our-resources/bulletins/bulletin-295-inhaler-carbon-footprint/</a>                         |                                                                           |
| Clinical supply | Waste                                   | IMP kit            | IMP kit (packaging)                              | Hazardous waste incineration |                       |                              | 0.85 kg CO2 eq        | kit            | Based on previous trials                                                                                                                                                                                                    | IMP kit primary and secondary packaging (weight range from 0.1 to 0.6 kg) |
| Clinical supply | Waste                                   | Intervention       | Intervention waste                               |                              |                       |                              | 0.136604764 kg CO2 eq | USD            | 2022 US EEIO factors <a href="https://www.epa.gov/land-research/us-environmentally-extended-input-output-useeio-models">https://www.epa.gov/land-research/us-environmentally-extended-input-output-useeio-models</a>        | Used: 562211 Hazardous Waste Treatment and Disposal                       |
| Clinical supply | Testing / diagnostics kits              | Testing kit        | Testing kit A                                    |                              |                       |                              | 0.34 kg CO2 eq        | kit            | Based on previous trials                                                                                                                                                                                                    | Cradle-to-gate manufacture                                                |
| Clinical supply | Testing / diagnostics kits              | Testing kit        | Testing kit B                                    |                              |                       |                              | 0.29 kg CO2 eq        | kit            | Based on previous trials                                                                                                                                                                                                    | Cradle-to-gate manufacture                                                |
| Clinical supply | Testing / diagnostics kits              | Testing kit        | Testing kit C                                    |                              |                       |                              | 0.29 kg CO2 eq        | kit            | Based on previous trials                                                                                                                                                                                                    | Cradle-to-gate manufacture                                                |
| Clinical supply | Testing / diagnostics kits              | Testing kit        | Testing kit D                                    |                              |                       |                              | 0.31 kg CO2 eq        | kit            | Based on previous trials                                                                                                                                                                                                    | Cradle-to-gate manufacture                                                |
| Clinical supply | Testing / diagnostics kits              | Testing kit        | Testing kit E                                    |                              |                       |                              | 0.44 kg CO2 eq        | kit            | Based on previous trials                                                                                                                                                                                                    | Cradle-to-gate manufacture                                                |
| Clinical supply | Testing / diagnostics kits              | Testing kit        | Testing kit average                              |                              |                       |                              | 0.334 kg CO2 eq       | kit            | Average impact of testing kits A through E (inclusive)                                                                                                                                                                      | Cradle-to-gate manufacture                                                |
| Clinical supply | Testing / diagnostics kits              | Testing kit        | Spend                                            |                              |                       |                              | 0.031990547 kg CO2 eq | USD            | 2022 US EEIO factors <a href="https://www.epa.gov/land-research/us-environmentally-extended-input-output-useeio-models">https://www.epa.gov/land-research/us-environmentally-extended-input-output-useeio-models</a>        | Used: 325413 Blood sugar, pregnancy, and other diagnostic test kits       |
| Clinical supply | Testing / diagnostics kits              | Waste              | Kit waste                                        |                              |                       |                              | 0.137 kg CO2 eq       | USD            | 2022 US EEIO factors <a href="https://www.epa.gov/land-research/us-environmentally-extended-input-output-useeio-models">https://www.epa.gov/land-research/us-environmentally-extended-input-output-useeio-models</a>        | Used: 562211 Hazardous Waste Treatment and Disposal                       |
| Clinical supply | Participant electronic devices          | Electronic devices | Device (smartphone)                              |                              |                       |                              | 54.78 kg CO2 eq       | device         | <a href="https://www.apple.com/environment/pdf/products/iphone/iPhone_15_Pro_and_iPhone_15_Pro_Max_Sept2023.pdf">https://www.apple.com/environment/pdf/products/iphone/iPhone_15_Pro_and_iPhone_15_Pro_Max_Sept2023.pdf</a> | Cradle-to-gate manufacture, iPhone 15 pro (128 GB)                        |
| Clinical supply | Participant electronic devices          | Electronic devices | Device (tablet)                                  |                              |                       |                              | 63.2 kg CO2 eq        | device         | <a href="https://www.apple.com/environment/pdf/products/ipad/iPad_Air_PER_March2022.pdf">https://www.apple.com/environment/pdf/products/ipad/iPad_Air_PER_March2022.pdf</a>                                                 | Cradle-to-gate manufacture, 5th generation iPad (64GB)                    |
| Clinical supply | Participant electronic devices          | Electronic devices | Device (smartphone)                              | Use                          |                       |                              | 0.052 kWh             | hour           | Estimated from 52W charger                                                                                                                                                                                                  | 0.052 per hour for 4 hours                                                |
| Clinical supply | Participant electronic devices          | Electronic devices | Device (tablet)                                  | Use                          |                       |                              | 0.015 kWh             | hour           | Estimated from 15W charger                                                                                                                                                                                                  | 0.015 per hour for 8 hours                                                |
| Clinical supply | Participant electronic devices          | Electronic devices | Device (smartphone)                              | Use                          | GB                    |                              | 0.033 kg CO2 eq       | day            | UK Government. UK Government GHG conversion factors. sl : UK Government, 2023                                                                                                                                               |                                                                           |
| Clinical supply | Participant electronic devices          | Electronic devices | Device (smartphone)                              | Use                          | US                    |                              | 0.0548 kg CO2 eq      | day            | <a href="https://www.epa.gov/egrid/summary-data">https://www.epa.gov/egrid/summary-data</a>                                                                                                                                 | 0.457 kg CO2 eq/kWh                                                       |
| Clinical supply | Participant electronic devices          | Electronic devices | Device (smartphone)                              | Use                          | AU                    |                              | 0.0876 kg CO2 eq      | day            | <a href="https://www.dcceew.gov.au/sites/default/files/documents/national-greenhouse-account-factors-2023.pdf">https://www.dcceew.gov.au/sites/default/files/documents/national-greenhouse-account-factors-2023.pdf</a>     | 0.73 kg CO2 eq/kWh                                                        |
| Clinical supply | Participant electronic devices          | Electronic devices | Device (tablet)                                  | Use                          | GB                    |                              | 0.058 kg CO2 eq       | day            | UK Government. UK Government GHG conversion factors. sl : UK Government, 2023                                                                                                                                               |                                                                           |
| Clinical supply | Participant electronic devices          | Electronic devices | Device (tablet)                                  | Use                          | US                    |                              | 0.096 kg CO2 eq       | day            | <a href="https://www.epa.gov/egrid/summary-data">https://www.epa.gov/egrid/summary-data</a>                                                                                                                                 | 0.457 kg CO2 eq/kWh                                                       |
| Clinical supply | Participant electronic devices          | Electronic devices | Device (tablet)                                  | Use                          | AU                    |                              | 0.153 kg CO2 eq       | day            | <a href="https://www.dcceew.gov.au/sites/default/files/documents/national-greenhouse-account-factors-2023.pdf">https://www.dcceew.gov.au/sites/default/files/documents/national-greenhouse-account-factors-2023.pdf</a>     | 0.73 kg CO2 eq/kWh                                                        |
| Clinical supply | Participant electronic devices          | Electronic devices | Spend                                            |                              |                       |                              | 0.108449847 kg CO2 eq | USD            | 2022 US EEIO factors <a href="https://www.epa.gov/land-research/us-environmentally-extended-input-output-useeio-models">https://www.epa.gov/land-research/us-environmentally-extended-input-output-useeio-models</a>        | Used: 334220 Wireless communications                                      |

| Section                              | Activity                                | Category           | Name                           | Type      | Region (standardised) | GHG Emissions (standardised) | Unit (standardised) | Unit reference | Source                                                                                                                                                                                                                                             | Comments                                                 |
|--------------------------------------|-----------------------------------------|--------------------|--------------------------------|-----------|-----------------------|------------------------------|---------------------|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|
| Clinical supply                      | Waste                                   | Electronic devices | Electrical waste (WEEE)        | Landfill  |                       | 0.00888 kg CO2 eq            |                     | kg             | UK Government. UK Government GHG conversion factors. sl : UK Government, 2023                                                                                                                                                                      |                                                          |
| Clinical supply                      | Waste                                   | Electronic devices | Electrical waste (WEEE)        | Recycling |                       | 0.0213 kg CO2 eq             |                     | kg             | UK Government. UK Government GHG conversion factors. sl : UK Government, 2023                                                                                                                                                                      |                                                          |
| Clinical supply                      | Waste                                   | Electronic devices | Electrical waste (WEEE)        | Spend     |                       | 0.137 kg CO2 eq              |                     | USD            | 2022 US EEIO factors https://www.epa.gov/land-research/us-environmentally-extended-input-output-useeio-models                                                                                                                                      | Used: 562211 Hazardous Waste Treatment and Disposal      |
| Participant visits and accommodation | Participant visit to trial sites        |                    | Participant visit              |           |                       | 14 kg CO2 eq                 |                     | visit          | Calculated using UK Government 2023 GHG conversion factors                                                                                                                                                                                         | Assuming 70km by car                                     |
| Participant visits and accommodation | Participant visit to trial sites        |                    | Low intensity inpatient        |           |                       | 37.9 kg CO2 eq               |                     | bed day        | SHC. Sustainable Care Pathways Guidance. sl : Sustainable Healthcare Coalition (shcoalition.org)                                                                                                                                                   |                                                          |
| Participant visits and accommodation | Participant visit to trial sites        |                    | High intensity inpatient       |           |                       | 89.5 kg CO2 eq               |                     | bed day        | SHC. Sustainable Care Pathways Guidance. sl : Sustainable Healthcare Coalition (shcoalition.org)                                                                                                                                                   |                                                          |
| Participant visits and accommodation | Participant remote visits               |                    | Remote visit time              |           |                       | 60 minutes                   |                     |                | Based on previous trials                                                                                                                                                                                                                           |                                                          |
| Participant visits and accommodation | Participant remote visits               |                    | Laptop electricity consumption | Power     |                       | 0.05 kW                      |                     |                | Assumed 50 W charger                                                                                                                                                                                                                               |                                                          |
| Participant visits and accommodation | Participant remote visits               |                    | Laptop electricity impact      | Impact    |                       | 0.014 kg CO2 eq              |                     | hour           | Calculated using UK Government 2023 GHG conversion factors                                                                                                                                                                                         |                                                          |
| Participant visits and accommodation | Home visits                             |                    | Road travel                    | Car       |                       | 0.21 kg CO2 eq               |                     | km             | UK Government. UK Government GHG conversion factors. sl : UK Government, 2023                                                                                                                                                                      |                                                          |
| Participant visits and accommodation | Home visits                             |                    | Sample courier                 | Motorbike |                       | 0.14 kg CO2 eq               |                     | km             | UK Government. UK Government GHG conversion factors. sl : UK Government, 2023                                                                                                                                                                      |                                                          |
| Participant visits and accommodation | Home visits                             |                    | Gloves, sterile pair           |           |                       | 0.102 kg CO2 eq              |                     | unit           | Rizan, C, et al. The carbon footprint of products used in five common surgical operations: identifying contributing products and processes. sl : Journal of the Royal Society of Medicine. 2023;116(6):199-213. doi:10.1177/014107682311661, 2023. | Including packaging; cradle-to-gate manufacture          |
| Participant visits and accommodation | Home visits                             |                    | Face mask                      |           |                       | 0.015 kg CO2 eq              |                     | unit           | Rizan, C, et al. The carbon footprint of products used in five common surgical operations: identifying contributing products and processes. sl : Journal of the Royal Society of Medicine. 2023;116(6):199-213. doi:10.1177/014107682311661, 2023. | Cradle-to-gate manufacture                               |
| Trial procedures                     | Laboratory samples analysis and storage |                    | Sample storage                 |           |                       | 0.00162 kWh                  |                     | sample day     | https://betterbuildingssolutioncenter.energy.gov/sites/default/files/attachments/ulf_freezer_user_guide.pdf                                                                                                                                        |                                                          |
| Trial procedures                     | Laboratory samples analysis and storage |                    | Sample storage                 |           |                       | 0.000468 kg CO2 eq           |                     | sample day     | Based on UK Government GHG conversion factors 2023                                                                                                                                                                                                 | Considering 0.289 kg CO2 eq/kWh for global               |
| Trial procedures                     | Laboratory samples analysis and storage |                    | Full blood examination         |           |                       | 0.0459 kg CO2 eq             |                     | test           | McAlister, S, et al. The carbon footprint of pathology testing. sl : Med J Aust 2020; 212 (8): 377-382.    doi: 10.5694/mja2.50583, 2020.                                                                                                          |                                                          |
| Trial procedures                     | Laboratory samples analysis and storage |                    | Coagulation profile            |           |                       | 0.00256 kg CO2 eq            |                     | test           | McAlister, S, et al. The carbon footprint of pathology testing. sl : Med J Aust 2020; 212 (8): 377-382.    doi: 10.5694/mja2.50583, 2020.                                                                                                          |                                                          |
| Trial procedures                     | Laboratory samples analysis and storage |                    | Urea and electrolytes          |           |                       | 0.0153 kg CO2 eq             |                     | test           | McAlister, S, et al. The carbon footprint of pathology testing. sl : Med J Aust 2020; 212 (8): 377-382.    doi: 10.5694/mja2.50583, 2020.                                                                                                          |                                                          |
| Trial procedures                     | Laboratory samples analysis and storage |                    | -                              |           |                       | 0.00997 kg CO2 eq            |                     | test           | McAlister, S, et al. The carbon footprint of pathology testing. sl : Med J Aust 2020; 212 (8): 377-382.    doi: 10.5694/mja2.50583, 2020.                                                                                                          |                                                          |
| Trial procedures                     | Laboratory samples analysis and storage |                    | Arterial blood gases           |           |                       | 0.0111 kg CO2 eq             |                     | test           | McAlister, S, et al. The carbon footprint of pathology testing. sl : Med J Aust 2020; 212 (8): 377-382.    doi: 10.5694/mja2.50583, 2020.                                                                                                          |                                                          |
| Trial procedures                     | Laboratory samples analysis and storage |                    | Sample disposal                |           |                       | 0.025 kg CO2 eq              |                     | 10 mL sample   | McAlister, S, et al. The carbon footprint of pathology testing. sl : Med J Aust 2020; 212 (8): 377-382.    doi: 10.5694/mja2.50583, 2020.                                                                                                          |                                                          |
| Trial procedures                     | Imaging                                 |                    | MRI scan                       |           |                       | 17.5 kg CO2 eq               |                     | MRI scan       | McAlister, S, et al. The carbon footprint of pathology testing. sl : Med J Aust 2020; 212 (8): 377-382.    doi: 10.5694/mja2.50583, 2020.                                                                                                          | Includes scanner electricity use and all consumables and |
| Trial procedures                     | Imaging                                 |                    | CT scan                        |           |                       | 9.2 kg CO2 eq                |                     | CT scan        | McAlister, S, et al. The carbon footprint of pathology testing. sl : Med J Aust 2020; 212 (8): 377-382.    doi: 10.5694/mja2.50583, 2020.                                                                                                          | Includes scanner electricity use and all consumables and |
| Trial procedures                     | Imaging                                 |                    | X-ray                          |           |                       | 0.9 kg CO2 eq                |                     | X-ray          | McAlister, S, et al. The carbon footprint of pathology testing. sl : Med J Aust 2020; 212 (8): 377-382.    doi: 10.5694/mja2.50583, 2020.                                                                                                          | Includes scanner electricity use and all consumables and |
| Trial procedures                     | Imaging                                 |                    | Ultrasound                     |           |                       | 0.5 kg CO2 eq                |                     | ultrasound     | McAlister, S, et al. The carbon footprint of pathology testing. sl : Med J Aust 2020; 212 (8): 377-382.    doi: 10.5694/mja2.50583, 2020.                                                                                                          | Includes scanner electricity use and all consumables and |
| Trial procedures                     | Surgical procedures                     |                    | Surgical procedure             |           |                       | 54.4 kg CO2 eq               |                     | hour           | SHC. Sustainable Care Pathways Guidance. sl : Sustainable Healthcare Coalition (shcoalition.org)                                                                                                                                                   |                                                          |
| Trial procedures                     | Data management including storage       |                    | Hospital files                 |           |                       | 0.0057 kg CO2 eq             |                     | page           | Jessica, Griffiths, et al. Quantifying the carbon footprint of clinical trials: guidance development and pilot study. sl : PREPRINT (Version 1) available at Research Square [https://doi.org/10.21203/rs.3.rs, 2023                               |                                                          |



| Section          | Activity                          | Category | Name                               | Type | Region (standardised) | GHG Emissions (standardised) | Unit (standardised) | Unit reference    | Source                                                                                                                                                                                                                                                                    | Comments                                                                                                                                |
|------------------|-----------------------------------|----------|------------------------------------|------|-----------------------|------------------------------|---------------------|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| Trial procedures | Data management including storage |          | Scans                              |      |                       | 0.015 kg CO2 eq              |                     | scan burned to CD | Jessica, Griffiths, et al. Quantifying the carbon footprint of clinical trials: guidance development and pilot study. sl : PREPRINT (Version 1) available at Research Square [https://doi.org/10.21203/rs.3.rs, 2023                                                      |                                                                                                                                         |
| Trial procedures | Data management including storage |          | CDs/DVDs                           |      |                       | 0.83 kg CO2 eq               |                     | CD manufacture d  | Jessica, Griffiths, et al. Quantifying the carbon footprint of clinical trials: guidance development and pilot study. sl : PREPRINT (Version 1) available at Research Square [https://doi.org/10.21203/rs.3.rs, 2023                                                      |                                                                                                                                         |
| Trial procedures | Data management including storage |          | Data storage, electronic           |      |                       | 0.0046 kWh                   |                     | GB                | Dizar Al Kez, Aoife M. Foley, David Laverty, Dylan Furszyfer Del Rio, Benjamin Sovacool. Exploring the sustainability challenges facing digitalization and internet data centers. sl : Journal of Cleaner Production, 2022. https://doi.org/10.1016/j.jclepro.2022.133633 |                                                                                                                                         |
| Trial procedures | Data management including storage |          | Electronic data transfer           |      |                       | 0.06 kWh                     |                     | GB                | Aslan, J., Mayers, K., Koomey, J.G. and France, C. Electricity Intensity of Internet Data Transmission: Untangling the Estimates. sl : Journal of Industrial Ecology, 22: 785-798., 2018. https://doi.org/10.1111/jiec.12630.                                             |                                                                                                                                         |
| Trial procedures | Data management including storage |          | Electricity consmption             |      |                       | 1032 kWh                     |                     | employee year     | Department of Health,. Health Technical Memorandum 07-02: EnCO2de 2015 – making energy work in healthcare Environment and sustainability Part A: Policy and management. sl : Department of Health, 2015                                                                   | 86 kWh/m2 (electricity). Assuming 12m2 floor area per FTE.                                                                              |
| Trial procedures | Data management including storage |          | Heat consumption                   |      |                       | 1476 kWh                     |                     | employee year     | Department of Health,. Health Technical Memorandum 07-02: EnCO2de 2015 – making energy work in healthcare Environment and sustainability Part A: Policy and management. sl : Department of Health, 2015                                                                   | 123 kWh/m2 (heating). Assuming 12m2 floor area per FTE.                                                                                 |
| Trial procedures | Trial documentation               |          | Documentation                      |      |                       | 0.0057 kg CO2 eq             |                     | page              | Jessica, Griffiths, et al. Quantifying the carbon footprint of clinical trials: guidance development and pilot study. sl : PREPRINT (Version 1) available at Research Square [https://doi.org/10.21203/rs.3.rs, 2023                                                      |                                                                                                                                         |
| Trial procedures | Trial documentation distribution  |          | Electronic data transfer           |      |                       | 0.06 kWh                     |                     | GB                | Aslan, J., Mayers, K., Koomey, J.G. and France, C. Electricity Intensity of Internet Data Transmission: Untangling the Estimates. sl : Journal of Industrial Ecology, 22: 785-798., 2018. https://doi.org/10.1111/jiec.12630.                                             |                                                                                                                                         |
| Trial procedures | Trial documentation distribution  |          | Electronic data transfer           |      | GB                    | 0.0165 kg CO2 eq             |                     | GB                | Based on UK Government GHG conversion factors 2023                                                                                                                                                                                                                        | Considering 0.275 kg CO2 eq/kWh for UK                                                                                                  |
| Trial procedures | Trial documentation distribution  |          | Electronic data transfer           |      | US                    | 0.0274 kg CO2 eq             |                     | GB                | https://www.epa.gov/egrid/summary-data                                                                                                                                                                                                                                    | 0.457 kg CO2 eq/kWh                                                                                                                     |
| Trial procedures | Trial documentation distribution  |          | Electronic data transfer           |      | AU                    | 0.0438 kg CO2 eq             |                     | GB                | https://www.dcceew.gov.au/sites/default/files/documents/national-greenhouse-account-factors-2023.pdf                                                                                                                                                                      | 0.73 kg CO2 eq/kWh                                                                                                                      |
| Trial sites      | Trial site impact (overhead)      |          | Electricity consumption (per year) |      |                       | 1238 kWh                     |                     | employee year     | Department of Health,. Health Technical Memorandum 07-02: EnCO2de 2015 – making energy work in healthcare Environment and sustainability Part A: Policy and management. sl : Department of Health, 2015.                                                                  | Clinic/health centre: 75 kWh/m2 (electricity), floor area of 1,317 m2. Assumed 16.5m2 per FTE. FTE assumed to work 1864 hours per year. |
| Trial sites      | Trial site impact (overhead)      |          | Electricity consumption (per hour) |      |                       | 0.664 kWh                    |                     | employee hour     | Department of Health,. Health Technical Memorandum 07-02: EnCO2de 2015 – making energy work in healthcare Environment and sustainability Part A: Policy and management. sl : Department of Health, 2015.                                                                  | Clinic/health centre: 75 kWh/m2 (electricity), floor area of 1,317 m2. Assumed 16.5m2 per FTE. FTE assumed to work 1864 hours per year. |
| Trial sites      | Trial site impact (overhead)      |          | Electricity impact (per year)      |      | GB                    | 340.5 kg CO2 eq              |                     | employee year     | Based on UK Government GHG conversion factors 2023                                                                                                                                                                                                                        | Considering 0.275 kg CO2 eq/kWh for UK                                                                                                  |
| Trial sites      | Trial site impact (overhead)      |          | Electricity impact (per year)      |      | US                    | 565.8 kg CO2 eq              |                     | employee year     | https://www.epa.gov/egrid/summary-data                                                                                                                                                                                                                                    | 0.457 kg CO2 eq/kWh                                                                                                                     |
| Trial sites      | Trial site impact (overhead)      |          | Electricity impact (per year)      |      | AU                    | 903.7 kg CO2 eq              |                     | employee year     | https://www.dcceew.gov.au/sites/default/files/documents/national-greenhouse-account-factors-2023.pdf                                                                                                                                                                      | 0.73 kg CO2 eq/kWh                                                                                                                      |
| Trial sites      | Trial site impact (overhead)      |          | Heat consumption (per year)        |      |                       | 2591 kWh                     |                     | employee year     | Department of Health,. Health Technical Memorandum 07-02: EnCO2de 2015 – making energy work in healthcare Environment and sustainability Part A: Policy and management. sl : Department of Health, 2015.                                                                  | Clinic/health centre: 157 kWh/m2 (heating), floor area of 1,317 m2. Assumed 16.5m2 per FTE. FTE assumed to work 1864 hours per year.    |
| Trial sites      | Trial site impact (overhead)      |          | Heat consumption (per hour)        |      |                       | 1.39 kWh                     |                     | employee hour     | Based on UK Government GHG conversion factors 2023                                                                                                                                                                                                                        | Clinic/health centre: 157 kWh/m2 (heating), floor area of 1,317 m2. Assumed 16.5m2 per FTE. FTE assumed to work 1864 hours per year.    |
| Trial sites      | Trial site impact (overhead)      |          | Heat impact                        |      |                       | 603.7 kg CO2 eq              |                     | employee year     | Based on UK Government GHG conversion factors 2023                                                                                                                                                                                                                        | Considering 0.233 kg CO2 eq/kWh for UK                                                                                                  |

| Section                                   | Activity                             | Category | Name                                          | Type | Region (standardised) | GHG Emissions (standardised) | Unit (standardised) | Unit reference                 | Source                                                                                                                                                                                                  | Comments                                                   |
|-------------------------------------------|--------------------------------------|----------|-----------------------------------------------|------|-----------------------|------------------------------|---------------------|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|
| Trial sites                               | Trial site visits and trial meetings |          | Electricity consumption                       |      |                       | 0.143 kWh                    |                     | attendee hour external meeting | Department of Health,. Health Technical Memorandum 07-02: EnCO2de 2015 – making energy work in healthcare Environment and sustainability Part A: Policy and management. sl : Department of Health, 2015 | 86 kWh/m2 (electricity). Assuming 12m2 floor area per FTE. |
| Trial sites                               | Trial site visits and trial meetings |          | Electricity impact                            |      | GB                    | 0.0393 kg CO2 eq             |                     | attendee hour external meeting | Department of Health,. Health Technical Memorandum 07-02: EnCO2de 2015 – making energy work in healthcare Environment and sustainability Part A: Policy and management. sl : Department of Health, 2015 | 86 kWh/m2 (electricity). Assuming 12m2 floor area per FTE. |
| Trial sites                               | Trial site visits and trial meetings |          | Electricity impact                            |      | US                    | 0.0654 kg CO2 eq             |                     | attendee hour external meeting | https://www.epa.gov/egrid/summary-data                                                                                                                                                                  | 0.457 kg CO2 eq/kWh                                        |
| Trial sites                               | Trial site visits and trial meetings |          | Electricity impact                            |      | AU                    | 0.104 kg CO2 eq              |                     | attendee hour external meeting | https://www.dcceew.gov.au/sites/default/files/documents/national-greenhouse-account-factors-2023.pdf                                                                                                    | 0.73 kg CO2 eq/kWh                                         |
| Trial sites                               | Trial site visits and trial meetings |          | Heat consumption                              |      |                       | 0.204 kWh                    |                     | attendee hour external meeting | Department of Health,. Health Technical Memorandum 07-02: EnCO2de 2015 – making energy work in healthcare Environment and sustainability Part A: Policy and management. sl : Department of Health, 2015 | 123 kWh/m2 (heating). Assuming 12m2 floor area per FTE.    |
| Trial sites                               | Trial site visits and trial meetings |          | Heat impact                                   |      |                       | 0.048 kg CO2 eq              |                     | attendee hour external meeting | Based on UK Government GHG conversion factors 2023                                                                                                                                                      | Considering 0.233 kg CO2 eq/kWh for UK                     |
| Trial sites                               | Trial site visits and trial meetings |          | Meeting lunches or hotel dinners (vegetarian) |      |                       | 2.6 kg CO2 eq                |                     | meal person                    | WWF. Food in a warming world report. sl : WWF, 2018.                                                                                                                                                    |                                                            |
| Trial sites                               | Trial site visits and trial meetings |          | Meeting lunches or hotel dinners (meat)       |      |                       | 5.92 kg CO2 eq               |                     | meal person                    | WWF. Food in a warming world report. sl : WWF, 2018.                                                                                                                                                    |                                                            |
| Sponsor trial management and trial design | Sponsor trial management utilities   |          | Electricity consumption (per year)            |      |                       | 1032 kWh                     |                     | employee year                  | Department of Health,. Health Technical Memorandum 07-02: EnCO2de 2015 – making energy work in healthcare Environment and sustainability Part A: Policy and management. sl : Department of Health, 2015 | 86 kWh/m2 (electricity). Assuming 12m2 floor area per FTE. |
| Sponsor trial management and trial design | Sponsor trial management utilities   |          | Electricity consumption (per hour)            |      |                       | 0.554 kWh                    |                     | employee hour                  | Department of Health,. Health Technical Memorandum 07-02: EnCO2de 2015 – making energy work in healthcare Environment and sustainability Part A: Policy and management. sl : Department of Health, 2015 | 86 kWh/m2 (electricity). Assuming 12m2 floor area per FTE. |
| Sponsor trial management and trial design | Sponsor trial management utilities   |          | Electricity impact                            |      | GB                    | 283.8 kg CO2 eq              |                     | employee year                  | Based on UK Government GHG conversion factors 2023                                                                                                                                                      | Considering 0.275 kg CO2 eq/kWh for UK                     |
| Sponsor trial management and trial design | Sponsor trial management utilities   |          | Electricity impact                            |      | US                    | 471.6 kg CO2 eq              |                     | employee year                  | https://www.epa.gov/egrid/summary-data                                                                                                                                                                  | 0.457 kg CO2 eq/kWh                                        |
| Sponsor trial management and trial design | Sponsor trial management utilities   |          | Electricity impact                            |      | AU                    | 753.4 kg CO2 eq              |                     | employee year                  | https://www.dcceew.gov.au/sites/default/files/documents/national-greenhouse-account-factors-2023.pdf                                                                                                    | 0.73 kg CO2 eq/kWh                                         |
| Sponsor trial management and trial design | Sponsor trial management utilities   |          | Heat consumption (per year)                   |      |                       | 1476 kWh                     |                     | employee year                  | Department of Health,. Health Technical Memorandum 07-02: EnCO2de 2015 – making energy work in healthcare Environment and sustainability Part A: Policy and management. sl : Department of Health, 2015 | 123 kWh/m2 (heating). Assuming 12m2 floor area per FTE.    |
| Sponsor trial management and trial design | Sponsor trial management utilities   |          | Heat consumption (per hour)                   |      |                       | 0.792 kWh                    |                     | employee hour                  | Department of Health,. Health Technical Memorandum 07-02: EnCO2de 2015 – making energy work in healthcare Environment and sustainability Part A: Policy and management. sl : Department of Health, 2016 | 124 kWh/m2 (heating). Assuming 12m2 floor area per FTE.    |
| Sponsor trial management and trial design | Sponsor trial management utilities   |          | Heat impact                                   |      |                       | 343.9 kg CO2 eq              |                     | employee year                  | Based on UK Government GHG conversion factors 2023                                                                                                                                                      | Considering 0.233 kg CO2 eq/kWh for UK                     |
| Sponsor trial management and trial design | Sponsor trial management             |          | Spend                                         |      |                       | 0.456553894 kg CO2 eq        |                     | USD                            | 2022 US EEIO factors https://www.epa.gov/land-research/us-environmentally-extended-input-output-useeio-models                                                                                           | Used: 561110 Office Administrative Services                |
| Trial meetings                            | Meetings laptop use                  |          | Laptop use                                    |      |                       | 0.014 kg CO2 eq              |                     | per hour                       | Calculated using UK Government 2023 GHG conversion factors                                                                                                                                              |                                                            |

| Category    | Sub-Category | Descriptor                     | Standardised region | GHG emissions (standardised) | Unit      | Unit reference | Source                                                                                                                                                                                                                                            | Comments                                                       |
|-------------|--------------|--------------------------------|---------------------|------------------------------|-----------|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|
| Consumables | Consumables  | Syringe, 20 mL                 |                     | 0.082                        | kg CO2 eq | unit           | Rizan, C, et al. The carbon footprint of products used in five common surgical operations: identifying contributing products and processes. sl : Journal of the Royal Society of Medicine. 2023;116(6):199-213. doi:10.1177/014107682311661, 2023 | Cradle-to-gate manufacture                                     |
| Consumables | Consumables  | Needle, green, stainless steel |                     | 0.003                        | kg CO2 eq | unit           | Rizan, C, et al. The carbon footprint of products used in five common surgical operations: identifying contributing products and processes. sl : Journal of the Royal Society of Medicine. 2023;116(6):199-213. doi:10.1177/014107682311661, 2023 | Cradle-to-gate manufacture                                     |
| Consumables | Consumables  | Gloves, sterile pair           |                     | 0.102                        | kg CO2 eq | unit           | Rizan, C, et al. The carbon footprint of products used in five common surgical operations: identifying contributing products and processes. sl : Journal of the Royal Society of Medicine. 2023;116(6):199-213. doi:10.1177/014107682311661, 2023 | Cradle-to-gate manufacture                                     |
| Consumables | Consumables  | Face mask                      |                     | 0.015                        | kg CO2 eq | unit           | Rizan, C, et al. The carbon footprint of products used in five common surgical operations: identifying contributing products and processes. sl : Journal of the Royal Society of Medicine. 2023;116(6):199-213. doi:10.1177/014107682311661, 2023 | Cradle-to-gate manufacture                                     |
| Transport   | Transport    | Dry ice                        |                     | 3.7                          | kg CO2 eq | kg             | Chemical stoichiometry of carbon sublimation to CO2                                                                                                                                                                                               | Manufacture and ultimate evaporation                           |
| Transport   | Transport    | Frozen shipper                 |                     | 26.5                         | kg CO2 eq | unit           | Based on previous trials                                                                                                                                                                                                                          |                                                                |
| Transport   | Transport    | Ambient shipper                |                     | 0.3450                       | kg CO2 eq | unit           | Based on previous trials                                                                                                                                                                                                                          |                                                                |
| Transport   | Transport    | Road (ambient)                 |                     | 0.00012                      | kg CO2 eq | kgkm           | UK Government 2023 GHG conversion factors                                                                                                                                                                                                         | HGV (diesel), average laden (inc. WTT)                         |
| Transport   | Transport    | Road (chilled)                 |                     | 0.00014                      | kg CO2 eq | kgkm           | UK Government 2023 GHG conversion factors                                                                                                                                                                                                         | Refrigerated HGV (diesel), average laden (inc. WTT)            |
| Transport   | Transport    | Air                            |                     | 0.0012                       | kg CO2 eq | kgkm           | UK Government 2023 GHG conversion factors                                                                                                                                                                                                         | International flight (inc. WTT and indirect radiative forcing) |
| Travel      | Travel       | Passenger car                  |                     | 0.2094                       | kg CO2 eq | km             | UK Government 2023 GHG conversion factors                                                                                                                                                                                                         | Petrol, average car                                            |
| Travel      | Travel       | Aeroplane (long haul)          |                     | 0.2934                       | kg CO2 eq | passenger km   | UK Government 2023 GHG conversion factors                                                                                                                                                                                                         | Long hual to/from UK, average passenger (with RF)              |
| Travel      | Travel       | Aeroplane (domestic)           |                     | 0.3061                       | kg CO2 eq | passenger km   | UK Government 2023 GHG conversion factors                                                                                                                                                                                                         | Domestic to/from UK, average passenger (with RF)               |
| Travel      | Travel       | Bus                            |                     | 0.1271                       | kg CO2 eq | passenger km   | UK Government 2023 GHG conversion factors                                                                                                                                                                                                         | Average local bus                                              |
| Travel      | Travel       | Coach                          |                     | 0.0337                       | kg CO2 eq | passenger km   | UK Government 2023 GHG conversion factors                                                                                                                                                                                                         | Coach                                                          |
| Travel      | Travel       | Light rail/tram                |                     | 0.0361                       | kg CO2 eq | passenger km   | UK Government 2023 GHG conversion factors                                                                                                                                                                                                         | Light rail and tram                                            |
| Travel      | Travel       | National rail                  |                     | 0.0444                       | kg CO2 eq | passenger km   | UK Government 2023 GHG conversion factors                                                                                                                                                                                                         | National rail                                                  |
| Travel      | Travel       | Taxi                           |                     | 0.2598                       | kg CO2 eq | km             | UK Government 2023 GHG conversion factors                                                                                                                                                                                                         | Regular taxi                                                   |
| Travel      | Travel       | Public transport               |                     | 0.1002                       | kg CO2 eq | passenger km   | Average of UK Gov 2023 public transport factors (bus, coach, light rail/tram, national rail, taxi)                                                                                                                                                |                                                                |
| Travel      | Travel       | Hotel stay                     | GB                  | 10.4                         | kg CO2 eq | room night     | UK Government 2023 GHG conversion factors                                                                                                                                                                                                         |                                                                |
| Travel      | Travel       | Hotel stay                     | US                  | 16.1                         | kg CO2 eq | room night     | UK Government 2023 GHG conversion factors                                                                                                                                                                                                         |                                                                |
| Travel      | Travel       | Hotel stay                     | JP                  | 39.0                         | kg CO2 eq | room night     | UK Government 2023 GHG conversion factors                                                                                                                                                                                                         |                                                                |
| Travel      | Travel       | Hotel stay                     | AE                  | 63.8                         | kg CO2 eq | room night     | UK Government 2023 GHG conversion factors                                                                                                                                                                                                         |                                                                |
| Travel      | Travel       | Hotel stay                     |                     | 40.3                         | kg CO2 eq | room night     | Average of all DEFRA country specific hotel stay factors                                                                                                                                                                                          |                                                                |
| Travel      | Travel       | Employee commute               |                     | 11.0                         | kg CO2 eq | day            | UK Government 2023 GHG conversion factors                                                                                                                                                                                                         | Assumed 50km round trip by car                                 |
| Utilities   | Electricity  | Grid                           |                     | 0.289                        | kg CO2 eq | kWh            | Average of country specific electricity factors                                                                                                                                                                                                   |                                                                |
| Utilities   | Electricity  | Green                          |                     | 0.000035                     | kg CO2 eq | kWh            | Covenant of Mayors The Covenant of Mayors for Climate and Energy Reporting Guidelines Version 1.0 (July 2016)2016assumed wind                                                                                                                     |                                                                |
| Utilities   | Electricity  | Grid                           | AT                  | 0.1185                       | kg CO2 eq | kWh            | European Residual Mixes 2021 results, Association of Issuing Bodies 2021. Production Mix 2021.                                                                                                                                                    |                                                                |
| Utilities   | Electricity  | Grid                           | BA                  | 0.5585                       | kg CO2 eq | kWh            | European Residual Mixes 2021 results, Association of Issuing Bodies 2021. Production Mix 2021.                                                                                                                                                    |                                                                |
| Utilities   | Electricity  | Grid                           | BE                  | 0.1226                       | kg CO2 eq | kWh            | European Residual Mixes 2021 results, Association of Issuing Bodies 2021. Production Mix 2021.                                                                                                                                                    |                                                                |
| Utilities   | Electricity  | Grid                           | BG                  | 0.4041                       | kg CO2 eq | kWh            | European Residual Mixes 2021 results, Association of Issuing Bodies 2021. Production Mix 2021.                                                                                                                                                    |                                                                |
| Utilities   | Electricity  | Grid                           | CH                  | 0.0116                       | kg CO2 eq | kWh            | European Residual Mixes 2021 results, Association of Issuing Bodies 2021. Production Mix 2021.                                                                                                                                                    |                                                                |
| Utilities   | Electricity  | Grid                           | CY                  | 0.6230                       | kg CO2 eq | kWh            | European Residual Mixes 2021 results, Association of Issuing Bodies 2021. Production Mix 2021.                                                                                                                                                    |                                                                |
| Utilities   | Electricity  | Grid                           | CZ                  | 0.5067                       | kg CO2 eq | kWh            | European Residual Mixes 2021 results, Association of Issuing Bodies 2021. Production Mix 2021.                                                                                                                                                    |                                                                |
| Utilities   | Electricity  | Grid                           | DE                  | 0.3776                       | kg CO2 eq | kWh            | European Residual Mixes 2021 results, Association of Issuing Bodies 2021. Production Mix 2021.                                                                                                                                                    |                                                                |
| Utilities   | Electricity  | Grid                           | DK                  | 0.1813                       | kg CO2 eq | kWh            | European Residual Mixes 2021 results, Association of Issuing Bodies 2021. Production Mix 2021.                                                                                                                                                    |                                                                |
| Utilities   | Electricity  | Grid                           | EE                  | 0.6161                       | kg CO2 eq | kWh            | European Residual Mixes 2021 results, Association of Issuing Bodies 2021. Production Mix 2021.                                                                                                                                                    |                                                                |
| Utilities   | Electricity  | Grid                           | ES                  | 0.1533                       | kg CO2 eq | kWh            | European Residual Mixes 2021 results, Association of Issuing Bodies 2021. Production Mix 2021.                                                                                                                                                    |                                                                |



| Category  | Sub-Category | Descriptor  | Standardised region | GHG emissions (standardised) | Unit      | Unit reference | Source                                                                                                                                             | Comments |
|-----------|--------------|-------------|---------------------|------------------------------|-----------|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| Utilities | Electricity  | Grid        | FI                  | 0.0958                       | kg CO2 eq | kWh            | European Residual Mixes 2021 results, Association of Issuing Bodies 2021. Production Mix 2021.                                                     |          |
| Utilities | Electricity  | Grid        | FR                  | 0.0410                       | kg CO2 eq | kWh            | European Residual Mixes 2021 results, Association of Issuing Bodies 2021. Production Mix 2021.                                                     |          |
| Utilities | Electricity  | Grid        | GB                  | 0.2750                       | kg CO2 eq | kWh            | BEIS 2023 Carbon factors.                                                                                                                          |          |
| Utilities | Electricity  | Grid        | GR                  | 0.3366                       | kg CO2 eq | kWh            | European Residual Mixes 2021 results, Association of Issuing Bodies 2021. Production Mix 2021.                                                     |          |
| Utilities | Electricity  | Grid        | HR                  | 0.2005                       | kg CO2 eq | kWh            | European Residual Mixes 2021 results, Association of Issuing Bodies 2021. Production Mix 2021.                                                     |          |
| Utilities | Electricity  | Grid        | HU                  | 0.2240                       | kg CO2 eq | kWh            | European Residual Mixes 2021 results, Association of Issuing Bodies 2021. Production Mix 2021.                                                     |          |
| Utilities | Electricity  | Grid        | IE                  | 0.3771                       | kg CO2 eq | kWh            | European Residual Mixes 2021 results, Association of Issuing Bodies 2021. Production Mix 2021.                                                     |          |
| Utilities | Electricity  | Grid        | IS                  | 0.0001                       | kg CO2 eq | kWh            | European Residual Mixes 2021 results, Association of Issuing Bodies 2021. Production Mix 2021.                                                     |          |
| Utilities | Electricity  | Grid        | IT                  | 0.3069                       | kg CO2 eq | kWh            | European Residual Mixes 2021 results, Association of Issuing Bodies 2021. Production Mix 2021.                                                     |          |
| Utilities | Electricity  | Grid        | LT                  | 0.2185                       | kg CO2 eq | kWh            | European Residual Mixes 2021 results, Association of Issuing Bodies 2021. Production Mix 2021.                                                     |          |
| Utilities | Electricity  | Grid        | LU                  | 0.0988                       | kg CO2 eq | kWh            | European Residual Mixes 2021 results, Association of Issuing Bodies 2021. Production Mix 2021.                                                     |          |
| Utilities | Electricity  | Grid        | LV                  | 0.2197                       | kg CO2 eq | kWh            | European Residual Mixes 2021 results, Association of Issuing Bodies 2021. Production Mix 2021.                                                     |          |
| Utilities | Electricity  | Grid        | ME                  | 0.4253                       | kg CO2 eq | kWh            | European Residual Mixes 2021 results, Association of Issuing Bodies 2021. Production Mix 2021.                                                     |          |
| Utilities | Electricity  | Grid        | MT                  | 0.6607                       | kg CO2 eq | kWh            | European Residual Mixes 2021 results, Association of Issuing Bodies 2021. Production Mix 2021.                                                     |          |
| Utilities | Electricity  | Grid        | NL                  | 0.3704                       | kg CO2 eq | kWh            | European Residual Mixes 2021 results, Association of Issuing Bodies 2021. Production Mix 2021.                                                     |          |
| Utilities | Electricity  | Grid        | NO                  | 0.0045                       | kg CO2 eq | kWh            | European Residual Mixes 2021 results, Association of Issuing Bodies 2021. Production Mix 2021.                                                     |          |
| Utilities | Electricity  | Grid        | PL                  | 0.7766                       | kg CO2 eq | kWh            | European Residual Mixes 2021 results, Association of Issuing Bodies 2021. Production Mix 2021.                                                     |          |
| Utilities | Electricity  | Grid        | PT                  | 0.1642                       | kg CO2 eq | kWh            | European Residual Mixes 2021 results, Association of Issuing Bodies 2021. Production Mix 2021.                                                     |          |
| Utilities | Electricity  | Grid        | RO                  | 0.2775                       | kg CO2 eq | kWh            | European Residual Mixes 2021 results, Association of Issuing Bodies 2021. Production Mix 2021.                                                     |          |
| Utilities | Electricity  | Grid        | RS                  | 0.6951                       | kg CO2 eq | kWh            | European Residual Mixes 2021 results, Association of Issuing Bodies 2021. Production Mix 2021.                                                     |          |
| Utilities | Electricity  | Grid        | SE                  | 0.0077                       | kg CO2 eq | kWh            | European Residual Mixes 2021 results, Association of Issuing Bodies 2021. Production Mix 2021.                                                     |          |
| Utilities | Electricity  | Grid        | SI                  | 0.2169                       | kg CO2 eq | kWh            | European Residual Mixes 2021 results, Association of Issuing Bodies 2021. Production Mix 2021.                                                     |          |
| Utilities | Electricity  | Grid        | SK                  | 0.1655                       | kg CO2 eq | kWh            | European Residual Mixes 2021 results, Association of Issuing Bodies 2021. Production Mix 2021.                                                     |          |
| Utilities | Electricity  | Grid        | US                  | 0.3730                       | kg CO2 eq | kWh            | <a href="https://www.epa.gov/climateleadership/ghg-emission-factors-hub">https://www.epa.gov/climateleadership/ghg-emission-factors-hub</a>        |          |
| Utilities | Fuels        | Natural gas | GB                  | 0.2102                       | kg CO2 eq | kWh            | BEIS 2023 Carbon factors .Gov.UK Government conversion factors for company reporting of greenhouse gas emissions Gross CV WTT + Combustion         |          |
| Utilities | Fuels        | Oil         | GB                  | 0.3142                       | kg CO2 eq | kWh            | BEIS 2023 Carbon factorsGov.UK Government conversion factors for company reporting of greenhouse gas emissions burning oil Net CV WTT + Combustion |          |
| Utilities | Fuels        | Biomass     | GB                  | 0.0482                       | kg CO2 eq | kWh            | BEIS 2023 Carbon factorsGov.UK Government conversion factors for company reporting of greenhouse gas emissions wood pellets WTT + Combustion       |          |
| Utilities | Fuels        | Other       |                     | 0.2102                       | kg CO2 eq | kWh            | BEIS 2023 Carbon factors .Gov.UK Government conversion factors for company reporting of greenhouse gas emissions Gross CV WTT + Combustion         |          |
| Utilities | Fuels        | Natural gas |                     | 0.2102                       | kg CO2 eq | kWh            | BEIS 2023 Carbon factors .Gov.UK Government conversion factors for company reporting of greenhouse gas emissions Gross CV WTT + Combustion         |          |
| Utilities | Fuels        | Oil         |                     | 0.3142                       | kg CO2 eq | kWh            | BEIS 2023 Carbon factorsGov.UK Government conversion factors for company reporting of greenhouse gas emissions burning oil Net CV WTT + Combustion |          |
| Utilities | Fuels        | Biomass     |                     | 0.0482                       | kg CO2 eq | kWh            | BEIS 2023 Carbon factorsGov.UK Government conversion factors for company reporting of greenhouse gas emissions wood pellets WTT + Combustion       |          |



| Category | Sub-Category | Descriptor                 | Standardised region | GHG emissions (standardised) | Unit      | Unit reference | Source                   | Comments                                                                                                                                                             |
|----------|--------------|----------------------------|---------------------|------------------------------|-----------|----------------|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Waste    | Waste        | Mixed waste (incineration) |                     | 1.5700                       | kg CO2 eq | kg             | Based on previous trials | Considering a generic mix of 60% plastic, 40% cardboard and aluminium (by mass), and that the waste would need to be transported to an incineration site 50 km away. |
| Waste    | Waste        | Mixed waste (landfill)     |                     | 0.3550                       | kg CO2 eq | kg             | Based on previous trials | Considering a generic mix of 60% plastic, 40% cardboard and aluminium (by mass), and that the waste would need to be transported to a landfill site 50 km away.      |