

## 6. Appendice –Fattori MI

WWF Consumer Seminar - On the track of Sustainable Life,  
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| Material                        | MI factor    | Source | Material                             | MI factor    | Source |
|---------------------------------|--------------|--------|--------------------------------------|--------------|--------|
| <b>Metals</b>                   | <b>kg/kg</b> |        | <b>Building Materials</b>            | <b>kg/kg</b> |        |
| Aluminium, primary              | 85           | 1      | Bitumen                              | 2,6          | 2      |
| Aluminium, secondary            | 3,5          | 1      | Brick (full brick)                   | 2,1          | 1      |
| Al-Mix 70% Primary, 30% second. | 61           |        | Brick (porous brick)                 | 2            | 1      |
| Antimony                        | 18           | 8      | Brick (roof brick)                   | 2,1          | 1      |
| Brass                           | 350          | 1      | Cement (iron & steel works)          | 2,2          | 1      |
| Chromium                        | 13,5         | 8      | Cement (Portland cement )            | 3,2          | 1      |
| Copper, primary                 | 500          | 1      | Coal fibre (PAN)                     | 61           | 1      |
| Copper, secondary               | 10           | 1      | Concrete, aerated concrete 500 kg/m3 | 2,3          | 1      |
| Co-Mix 60% Primary, 40% second. | 300          |        | Concrete, B25                        | 1,3          | 1      |
| Ferrochromium (53% Cr)          | 16           | 1      | EPS-foam                             | 11           | 1      |
| Ferromanganese                  | 8,2          | 8      | Fibre board (medium thick)           | 2            | 1      |
| Ferromolybdenum                 | 18           | 8      | Foam glass                           | 6,7          | 1      |
| Ferronickel (33%Ni)             | 47           | 1      | Glass wool                           | 3            | 1      |
| Ferrotitanium                   | 74           | 8      | Granit (granit slab, polished)       | 4,7          | 1      |
| Ferrotungsten                   | 97           | 8      | Hardboard                            | 2,9          | 1      |
| Ferrovandium                    | 57           | 8      | Lime sand brick                      | 1,3          | 1      |
| Gold                            | 540000       | 1      | Perlit foam                          | 2            | 1      |
| Iridium                         | 400000       | 8      | Plywood board                        | 2            | 1      |
| Lead                            | 16           | 1      | PUR-foam                             | 7,3          | 1      |
| Manganese                       | 13           | 8      | Recycled paper insulation            | 1,7          | 1      |
| Molybdeum                       | 670          | 8      | Stone wool                           | 4            | 1      |
| Nickel                          | 141          | 1      | XPS-foam                             | 11,3         | 1      |
| Osmium                          | 400000       | 8      |                                      |              |        |
| Palladium                       | 400000       | 8      | <b>Wood</b>                          | <b>kg/kg</b> |        |
| Pig Iron                        | 5,6          | 1      | Spruce (round wood)                  | 1,9          | 3      |
| Platinum                        | 320000       | 1      | Spruce (board etc.)                  | 2,2          | 3      |
| Rhodium                         | 400000       | 8      | Spruce ( matched board)              | 2,8          | 3      |
| Ruthenium                       | 400000       | 8      | Spruce ( doors, windows,etc.)        | 3,5          | 3      |
| Silver                          | 7500         | 1      | Beech (furniture)                    | 7,1          | 4      |
| Steel                           | 7            | 1      |                                      |              |        |
| Steel, electric steel           | 3,4          | 1      | <b>Chemical Materials</b>            | <b>kg/kg</b> |        |
| Steel, V2A (18%Cr, 9% Ni)       | 21           | 1      | Acetone                              | 3,2          | 1      |
| Steel, V4A (17%Cr, 12% Ni)      | 24           | 1      | Ammoniac (NH3)                       | 3,6          | 1      |
| Tin                             | 6800         | 8      | Carbamide                            | 3,5          | 1      |
| Titanium                        | 1000         | 1      | Chlorine (Cl2)                       | 6,1          | 1      |
| Tungsten                        | 123          | 8      | Epoxy resin                          | 13,7         | 1      |
| Vanadium                        | 133          | 8      | Ethylbenzol                          | 4,5          | 1      |
| Zinc                            | 23           | 1      | Ethylene                             | 3,9          | 1      |
| Zinc coated iron                | 9            | 3      | Formaldehyde                         | 1,11         | 1      |
| Iron with zinc                  | 9            | 1*     | Hydrochloric acid,37%                | 3            | 1      |
| <b>Mineral Materials</b>        | <b>kg/kg</b> |        | Methanol                             | 0,88         | 1      |
| Aluminium Oxide (Al 2O3)        | 7,4          | 1      | Naphta                               | 2,9          | 2      |
| Borax                           | 5,8          | 1      | Nitric acid, 100%                    | 1,05         | 1      |
| Boric acid                      | 7,6          | 1      | Nitrogen, liquid                     | 2,3          | 2      |
| Colemanite                      | 8,4          | 1      | Pentane                              | 2            | 1      |
| Diabase                         | 1,4          | 1      | Phenol                               | 3,2          | 1      |
| Diamond                         | 5E+06        | 1      | Polyester resin                      | 5,4          | 1      |
| Fluorspar                       | 2,9          | 1      | Polyethylene, PE                     | 5,4          | 1      |
| Graphite (synthetic)            | 20           | 1      | Polystyrene, PS                      | 7            | 5      |
| Gravel                          | 1,2          | 1      | Propylene                            | 3,9          | 1      |
| Gypsum                          | 1,8          | 1      | PVC                                  | 8            | 1      |
| Kaolin                          | 3,1          | 1      | Sodium hydroxide 50%                 | 6,1          | 1      |
| Lime (CaO, burned lime)         | 3,2          | 1      | Starch                               | 1,1          | 1      |
| Limestone                       | 2,5          | 1      | Sulphuric acid, 100%                 | 0,5          | 1      |
| Loam                            | 1,5          | 1      | Water glass, 35%                     | 1,2          | 1      |
| Magnesium (miner.)              | 10           | 1      |                                      |              |        |
| Potassium salt                  | 5,7          | 1      |                                      |              |        |
| Quartz sand ( Glass sand)       | 1,4          | 1      |                                      |              |        |
| Salt (NaCl)                     | 1,2          | 1      |                                      |              |        |
| Sand                            | 1,2          | 1      |                                      |              |        |
| Soda                            | 4,5          | 1      |                                      |              |        |

MI factors (renewable and non-renewable resources)  
(kg renewable/non-renewable resources per unit of output)

## L'Indicatore MIPS applicato alle manifestazioni sportive

| Material   | MI factor                  | Source |
|--|----------------------------|--------|
| <b>Others</b>                                    | kg/kg                      |        |
| Acrylic varnish                                  | 2,7                        | 1      |
| Aramid fibre                                     | 37                         | 1      |
| Caoutchouc                                       | 4                          | 1      |
| Cardboard  | 3                          | 1      |
| Cellulose  | 12                         | 2      |
| Colour, red lead                                 | 8                          | 1      |
| Colour, wall colour                              | 2,2                        | 1      |
| Container glass (0% recycled)                    | 3                          | 1      |
| Container glass (88% recycled)                   | 0,9                        | 1      |
| Cork   | 14                         | 8      |
| Cotton   | 22                         | 1      |
| Detergent  | 6                          | 9      |
| Glass fibre (E-glass)                            | 6,2                        | 1      |
| Latex  | 6                          | 1      |
| Leather  | 2                          | 1      |
| Linoleum   | 2                          | 1      |
| Machine oil                                      | 1,2                        | 9      |
| Paper  | 15                         | 1      |
| Polyester fibre                                  | 3,6                        | 1      |
| Porcelain  | 10                         | 1      |
| Rubber   | 5                          | 1      |
| Silk   | 26                         | 8      |
| Water  | 0,01                       |        |
| Viscose  | 7,5                        | 1      |
| Wool   | 147                        | 8      |
| <b>Combined heat and power production</b>        | kg/kWh                     |        |
| District heat FIN                                | 0,4                        | 6      |
| Mini CHP   | 0,16                       | 2      |
| <b>Energy Source</b>                             | kg/kg                      |        |
| Brown coal, (8,8 MJ/kg)                          | 10                         | 2      |
| Coke (29 MJ/kg)                                  | 4,2                        | 1      |
| Crude oil (42,6 MJ/kg)                           | 2,3                        | 2      |
| Hard coal, D (29,4 MJ/kg)                        | 2,6                        | 2      |
| Hard coal, import, D (27,5 MJ/kg)                | 5,8                        | 2      |
| Heavy heating oil (40,7 MJ/kg)                   | 2,6                        | 2      |
| Light heating oil (42,8 MJ/kg)                   | 2,5                        | 2      |
| Natural gas (41 MJ/kg)                           | 1,3                        | 2      |
| Petrol (42,8 MJ/kg)                              | 2,9                        | 2      |
| Refinery gas                                     | 2,6                        | 2      |
| Vapour (3,1 MJ/kg)                               | 0,4                        | 2      |
| <b>Electricity</b>                               | kg/kWh                     |        |
| Electricity network FIN                          | 0,41                       | 6      |
| Hard coal FIN                                    | 0,97                       | 6      |
| Hydropower FIN                                   | 0,11                       | 6      |
| Imported electricity FIN                         | 0,41                       | 6      |
| Natural gas FIN                                  | 0,2                        | 6      |
| Nuclear power FIN, waste management not included | 0,31                       | 6      |
| Oil FIN  | 0,32                       | 6      |
| Peat FIN   | 0,7                        | 6      |
| Wind power FIN                                   | 0,07                       | 2      |
| <b>Transports (kg/tkm)</b>                       | (kg/tkm)                   |        |
| Air cargo (only fuel consumption)                | 2,5                        | 10     |
| Inland water transport                           | 0,35                       | 1      |
| Ocean shipping                                   | 0,006                      | 1      |
| Rail transport                                   | 0,9                        | 1      |
| Road transport                                   | 1                          | 1      |
| <b>Disposal</b>                                  | kg/kg refuse               |        |
| Refuse dump (Austria)                            | 1,1                        | 2      |
| <b>Food/agricultural products</b>                | (renewable resources only) |        |
| Beef   | 28                         | 8      |
| Beer   | 1,2                        | 8      |

### Sources

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