Globalisation and Pollution: Tele-connecting Local Primary PM2.5 Emissions to Global Consumption

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**Caption**

Table S1. Definition of regions.

Table S2. Definition of sectors.

Table S3. Produced, consumed and traded PM2.5 emissions.

Table S4. Budget of average primary fine aerosol concentrations from inter-continental transport of aerosols from each source region to each receptor region, contributions of a region on itself (referred to ‘domestic’) are shown in bold: (a) induced by production of source region [Unit: μg∙m-3]; (b) induced by consumption of source region [Unit: μg∙m-3]; (c) the ratio concentrations induced by consumption to production.

Figure S1. Distribution of consumption-based PM2.5 emissions (FCr) in 2007 by mass of emissions in the region.

Figure S2. PM2.5 emissions embodied in imports and exports of the largest net importing/exporting countries/regions. Intermediate goods (gray) are those used by industries in the importing country to further processing and meet consumer demand for domestic goods.

### Supporting method

### Bridging PKU-inventory and GTAP classifications

**Table S1**. Definition of regions.

| Number | Code | Description | Member Countries |
| --- | --- | --- | --- |
| 1 | AUS | Australia | Australia, Cocos (Keeling) Islands, Christmas Island, Heard Island and McDonald Islands, Norfolk Island |
| 2 | NZL | New Zealand | New Zealand |
| 3 | XOC | Rest of Oceania | American Samoa, Cook Islands, Fiji, Micronesia Federated States of, Guam, Kiribati, Marshall Islands, Northern Mariana Islands, New Caledonia, Niue, Nauru, Palau, Papua New Guinea, French Polynesia, Solomon Islands, Tokelau, Tonga, Tuvalu, Vanuatu, Wallis and Futuna, Samoa, Pitcairn, United States Minor Outlying Islands  |
| 4 | CHN | China | China |
| 5 | HKG | Hong Kong | Hong Kong |
| 6 | JPN | Japan | Japan |
| 7 | KOR | Korea Republic of | The Korea Republic of |
| 8 | MNG | Mongolia | Mongolia |
| 9 | TWN | Taiwan | Taiwan |
| 10 | XEA | Rest of East Asia | Macao, Korea Democratic Peoples Republic of |
| 11 | KHM | Cambodia | Cambodia |
| 12 | IDN | Indonesia | Indonesia |
| 13 | LAO | Lao People's Democratic Republic | Lao People's Democratic Republic |
| 14 | MYS | Malaysia | Malaysia |
| 15 | PHL | Philippines | Philippines |
| 16 | SGP | Singapore | Singapore |
| 17 | THA | Thailand | Thailand |
| 18 | VNM | Viet Nam | Viet Nam |
| 19 | XSE | Rest of Southeast Asia | Brunei Darussalam, Myanmar, Timor Leste  |
| 20 | BGD | Bangladesh | Bangladesh |
| 21 | IND | India | India |
| 22 | NPL | Nepal | Nepal |
| 23 | PAK | Pakistan | Pakistan |
| 24 | LKA | Sri Lanka | Sri Lanka |
| 25 | XSA | Rest of South Asia | Afghanistan, Bhutan, Maldives |
| 26 | CAN | Canada | Canada |
| 27 | USA | United States of America | United States of America |
| 28 | MEX | Mexico | Mexico |
| 29 | XNA | Rest of North America | Bermuda, Greenland, Saint Pierre, and Miquelon |
| 30 | ARG | Argentina | Argentina |
| 31 | BOL | Bolivia, the Plurinational Republic of | Bolivia, the Plurinational Republic of |
| 32 | BRA | Brazil | Brazil |
| 33 | CHL | Chile | Chile |
| 34 | COL | Colombia | Colombia |
| 35 | ECU | Ecuador | Ecuador |
| 36 | PRY | Paraguay | Paraguay |
| 37 | PER | Peru | Peru |
| 38 | URY | Uruguay | Uruguay |
| 39 | VEN | Venezuela | Venezuela |
| 40 | XSM | Rest of South America | Falkland Islands (Malvinas), French Guiana, Guyana, Suriname, South Georgia and the South Sandwich Islands  |
| 41 | CRI | Costa Rica | Costa Rica |
| 42 | GTM | Guatemala | Guatemala |
| 43 | HND | Honduras | Honduras |
| 44 | NIC | Nicaragua | Nicaragua |
| 45 | PAN | Panama | Panama |
| 46 | SLV | El Salvador | El Salvador |
| 47 | XCA | Rest of Central America | Belize |
| 48 | XCB | Caribbean | Aruba, Anguilla, Netherlands Antilles, Antigua & Barbuda, Bahamas, Barbados, Cuba, Cayman Islands, Dominica, Dominican Republic, Grenada, Haiti, Jamaica, Saint Kitts and Nevis, Saint Lucia, Montserrat, Puerto Rico, Turks and Caicos Islands, Trinidad and Tobago, Saint Vincent and the Grenadines, Virgin Islands British, Virgin Islands U.S.  |
| 49 | AUT | Austria | Austria |
| 50 | BEL | Belgium | Belgium |
| 51 | CYP | Cyprus | Cyprus |
| 52 | CZE | Czech Republic | Czech Republic |
| 53 | DNK | Denmark | Denmark |
| 54 | EST | Estonia | Estonia |
| 55 | FIN | Finland | Finland, Aland Islands |
| 56 | FRA | France | France, Guadeloupe, Martinique, Reunion |
| 57 | DEU | Germany | Germany |
| 58 | GRC | Greece | Greece |
| 59 | HUN | Hungary | Hungary |
| 60 | IRL | Ireland | Ireland |
| 61 | ITA | Italy | Italy |
| 62 | LVA | Latvia | Latvia |
| 63 | LTU | Lithuania | Lithuania |
| 64 | LUX | Luxembourg | Luxembourg |
| 65 | MLT | Malta | Malta |
| 66 | NLD | Netherlands | Netherlands |
| 67 | POL | Poland | Poland |
| 68 | PRT | Portugal | Portugal |
| 69 | SVK | Slovakia | Slovakia |
| 70 | SVN | Slovenia | Slovenia |
| 71 | ESP | Spain | Spain |
| 72 | SWE | Sweden | Sweden |
| 73 | GBR | United Kingdom | United Kingdom |
| 74 | CHE | Switzerland | Switzerland |
| 75 | NOR | Norway | Norway, Svalbard and Jan Mayen |
| 76 | XEF | Rest of EFTA | Iceland, Liechtenstein |
| 77 | ALB | Albania | Albania |
| 78 | BGR | Bulgaria | Bulgaria |
| 79 | BLR | Belarus | Belarus |
| 80 | HRV | Croatia | Croatia |
| 81 | ROU | Romania | Romania |
| 82 | RUS | Russian Federation | Russian Federation |
| 83 | UKR | Ukraine | Ukraine |
| 84 | XEE | Rest of Eastern Europe | The Moldova Republic of |
| 85 | XER | Rest of Europe | Andorra, Bosnia, and Herzegovina, Faroe Islands, Gibraltar, Monaco, Macedonia the former Yugoslav Republic of, San Marino, Serbia, Guernsey, Isle of Man, Jersey, Montenegro, Holy See (Vatican City State) |
| 86 | KAZ | Kazakhstan | Kazakhstan |
| 87 | KGZ | Kyrgyzstan | Kyrgyzstan |
| 88 | XSU |  Rest of Former Soviet Union | Tajikistan, Turkmenistan, Uzbekistan |
| 89 | ARM | Armenia | Armenia |
| 90 | AZE | Azerbaijan | Azerbaijan |
| 91 | GEO | Georgia | Georgia |
| 92 | BHR | Bahrain | Bahrain |
| 93 | IRN | The Iran Islamic Republic of | The Iran Islamic Republic of |
| 94 | ISR | Israel | Israel |
| 95 | KWT | Kuwait | Kuwait |
| 96 | OMN | Oman | Oman |
| 97 | QAT | Qatar | Qatar |
| 98 | SAU | Saudi Arabia | Saudi Arabia |
| 99 | TUR | Turkey | Turkey |
| 100 | ARE | United Arab Emirates | United Arab Emirates |
| 101 | XWS | Rest of Western Asia | Iraq, Jordan, Lebanon, Palestinian Territory Occupied, Syrian Arab Republic, Yemen |
| 102 | EGY | Egypt | Egypt |
| 103 | MAR | Morocco | Morocco |
| 104 | TUN | Tunisia | Tunisia |
| 105 | XNF | Rest of North Africa | Algeria, Libyan Arab Jamahiriya, Western Sahara |
| 106 | BEN | Benin | Benin |
| 107 | BUF | Burkina Faso | Burkina Faso |
| 108 | CMR | Cameroon | Cameroon |
| 109 | CIV | Cote d'Ivoire | Cote d'Ivoire |
| 110 | GHA | Ghana | Ghana |
| 111 | GUI | Guinea | Guinea |
| 112 | NGA | Nigeria | Nigeria |
| 113 | SEN | Senegal | Senegal |
| 114 | TOG | Togo | Togo |
| 115 | XWF | Rest of Western Africa | Cape Verde, Gambia, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Saint Helena, Ascension and Tristan Da Cunha, Sierra Leone  |
| 116 | XCF | Central Africa | Central African Republic, Congo, Gabon, Equatorial Guinea, Sao Tome and Principe, Chad |
| 117 | XAC | South Central Africa | Angola, Congo the Democratic Republic of the |
| 118 | ETH | Ethiopia | Ethiopia |
| 119 | KEN | Kenya | Kenya |
| 120 | MDG | Madagascar | Madagascar |
| 121 | MWI | Malawi | Malawi |
| 122 | MUS | Mauritius | Mauritius |
| 123 | MOZ | Mozambique | Mozambique |
| 124 | RWA | Rwanda | Rwanda |
| 125 | TZA | Tanzania United Republic of | Tanzania United Republic of |
| 126 | UGA | Uganda | Uganda |
| 127 | ZMB | Zambia | Zambia |
| 128 | ZWE | Zimbabwe | Zimbabwe |
| 129 | XEC | Rest of Eastern Africa | Burundi, Comoros, Djibouti, Eritrea, Mayotte, Sudan, Somalia, Seychelles |
| 130 | BWA | Botswana | Botswana |
| 131 | NAM | Namibia | Namibia |
| 132 | ZAF | South Africa | South Africa |
| 133 | XSC | Customs Union | Lesotho, Swaziland |
| 134 | XTW | Rest of the World | Antarctica, French Southern Territories, Bouvet Island, British Indian Ocean Territory |

| **Table S2.** Definition of sectors. |
| --- |
| Number | Sector | Category  |
| 1 | Paddy rice | Agriculture |
| 2 | Wheat |
| 3 | Cereal grains nec |
| 4 | Vegetables, fruit, nuts; |
| 5 | Oil seeds |
| 6 | Sugarcane, sugar beet |
| 7 | Plant-based ﬁbers |
| 8 | Crops nec |
| 9 | Cattle, sheep, goats, horses |
| 10 | Animal products nec |
| 11 | Raw milk |
| 12 | Wool, silk-worm cocoons |
| 13 | Forestry |
| 14 | Fishing |
| 15 | Coal | Mining |
| 16 | Oil |
| 17 | Gas |
| 18 | Minerals nec |
| 19 | Meat: cattle, sheep, goats, horses | Light Manufacting |
| 20 | Meat products nec |
| 21 | Vegetable oils and fats |
| 22 | Dairy products |
| 23 | Processed rice |
| 24 | Sugar |
| 25 | Food products nec |
| 26 | Beverages and tobacco products |
| 27 | Textiles |
| 28 | Wearing apparel |
| 29 | Leather products |
| 30 | Wood products |
| 31 | Paper products, publishing |
| 32 | Petroleum, coal products | Petroleum, coal products |
| 33 | Chemical, rubber, plastic products | Chemical, rubber, plastic products |
| 34 | Mineral products nec | Mineral products |
| 35 | Ferrous metals |
| 36 | Metals nec | Metal products |
| 37 | Metal products |
| 38 | Motor vehicles and parts | Equipment Manufacturing |
| 39 | Transport equipment nec |
| 40 | Electronic equipment |
| 41 | Machinery and equipment nec |
| 42 | Manufactures nec |
| 43 | Electricity | Power generation |
| 44 | Gas manufacture, distribution |
| 45 | Water collection, puriﬁcation, and distribution |
| 46 | Construction | Construction |
| 47 | Trade | Non-transport Services |
| 48 | Transport nec | Transport |
| 49 | Sea transport |
| 50 | Air transport |
| 51 | Communication | Non-transport Services |
| 52 |  Financial services nec |
| 53 | Insurance |
| 54 | Business services nec |
| 55 | Recreation and other services |
| 56 | Public Administration, Defense, Health, Education |
| 57 | Dwellings |

**Table S3**. Produced, consumed and traded PM2.5 emissions.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Number | Region | Production basedEmissions (Gg) | Consumptionbased Emissions (Gg) | Emission embodied in exports (Gg) | EmissionEmbodied in imports (Gg) |
| 1 | Australia | 114.5 | 173.4 | 48.6 | 107.5 |
| 2 | New Zealand | 12.4 | 24.5 | 4.2 | 16.4 |
| 3 | Rest of Oceania | 22.9 | 16.8 | 11.2 | 5.1 |
| 4 | The mainland of China | 9371.7 | 6947.7 | 2717.0 | 293.0 |
| 5 | Hong Kong | 0.0 | 80.3 | 0.0 | 80.3 |
| 6 | Japan | 477.0 | 725.2 | 166.9 | 415.1 |
| 7 | Korea | 174.6 | 294.6 | 73.6 | 193.6 |
| 8 | Mongolia | 11.2 | 10.4 | 3.4 | 2.6 |
| 9 | Taiwan | 0.0 | 66.7 | 0.0 | 66.7 |
| 10 | Rest of East Asia | 123.3 | 91.8 | 42.7 | 11.2 |
| 11 | Cambodia | 22.6 | 25.1 | 4.3 | 6.7 |
| 12 | Indonesia | 425.4 | 400.6 | 105.2 | 80.4 |
| 13 | Lao People’s Democratic Republic | 34.0 | 28.8 | 7.5 | 2.2 |
| 14 | Malaysia | 113.3 | 93.4 | 72.2 | 52.4 |
| 15 | Philippines | 116.1 | 118.1 | 28.9 | 30.9 |
| 16 | Singapore | 4.8 | 43.2 | 3.4 | 41.7 |
| 17 | Thailand | 259.3 | 189.3 | 128.0 | 58.0 |
| 18 | Viet Nam | 231.2 | 187.2 | 93.8 | 49.8 |
| 19 | Rest of Southeast Asia | 96.3 | 73.6 | 32.5 | 9.8 |
| 20 | Bangladesh | 164.3 | 179.6 | 10.4 | 25.6 |
| 21 | India | 3060.3 | 2782.3 | 482.8 | 204.8 |
| 22 | Nepal | 29.8 | 32.7 | 2.2 | 5.1 |
| 23 | Pakistan | 251.7 | 256.4 | 32.2 | 36.9 |
| 24 | Sri Lanka | 20.0 | 29.7 | 4.3 | 13.9 |
| 25 | Rest of South Asia | 30.4 | 29.7 | 10.1 | 9.5 |
| 26 | Canada | 147.8 | 219.6 | 76.5 | 148.2 |
| 27 | United States of America | 1217.2 | 2275.4 | 220.2 | 1278.5 |
| 28 | Mexico | 183.1 | 221.3 | 54.6 | 92.8 |
| 29 | Rest of North America | 19.6 | 12.3 | 10.4 | 3.1 |
| 30 | Argentina | 253.1 | 98.3 | 183.0 | 28.2 |
| 31 | Bolivia | 14.0 | 13.7 | 3.2 | 3.0 |
| 32 | Brazil | 678.0 | 567.6 | 211.2 | 100.8 |
| 33 | Chile | 40.0 | 43.4 | 21.8 | 25.2 |
| 34 | Colombia | 53.4 | 64.4 | 13.6 | 24.5 |
| 35 | Ecuador | 21.0 | 27.6 | 4.2 | 10.8 |
| 36 | Paraguay | 27.3 | 18.3 | 13.0 | 4.0 |
| 37 | Peru | 36.3 | 43.6 | 9.4 | 16.8 |
| 38 | Uruguay | 10.0 | 8.5 | 6.3 | 4.8 |
| 39 | Venezuela | 72.0 | 78.1 | 22.2 | 28.2 |
| 40 | Rest of South America | 26.4 | 21.4 | 6.4 | 1.3 |
| 41 | Costa Rica | 6.0 | 7.6 | 3.2 | 4.8 |
| 42 | Guatemala | 11.3 | 14.5 | 3.8 | 7.0 |
| 43 | Honduras | 7.1 | 9.2 | 1.8 | 3.9 |
| 44 | Nicaragua | 3.9 | 5.2 | 1.3 | 2.6 |
| 45 | Panama | 4.5 | 8.4 | 0.7 | 4.7 |
| 46 | EI Salvador | 6.3 | 9.3 | 1.6 | 4.6 |
| 47 | Rest of Central America | 0.4 | 0.6 | 0.2 | 0.4 |
| 48 | Caribbean | 211.7 | 211.8 | 43.2 | 43.4 |
| 49 | Austria | 28.0 | 50.0 | 16.8 | 38.8 |
| 50 | Belgium | 32.6 | 104.6 | 24.1 | 96.2 |
| 51 | Cyprus | 2.8 | 8.8 | 0.7 | 6.6 |
| 52 | Czech Republic | 34.6 | 41.9 | 19.7 | 27.0 |
| 53 | Denmark | 16.6 | 48.5 | 8.5 | 40.4 |
| 54 | Estonia | 11.3 | 13.1 | 4.5 | 6.4 |
| 55 | Finland | 28.4 | 47.3 | 14.3 | 33.2 |
| 56 | France | 141.0 | 318.6 | 53.3 | 230.8 |
| 57 | Germany | 197.0 | 474.9 | 100.6 | 378.5 |
| 58 | Greece | 33.5 | 92.7 | 7.8 | 67.0 |
| 59 | Hungary | 18.7 | 31.5 | 10.2 | 23.0 |
| 60 | Ireland | 10.4 | 33.9 | 5.2 | 28.7 |
| 61 | Italy | 112.9 | 316.2 | 42.5 | 245.7 |
| 62 | Latvia | 6.8 | 12.7 | 3.5 | 9.5 |
| 63 | Lithuania | 15.9 | 20.3 | 7.8 | 12.2 |
| 64 | Luxembourg | 3.2 | 7.4 | 2.5 | 6.7 |
| 65 | Malta | 0.4 | 2.7 | 0.2 | 2.6 |
| 66 | Netherlands | 30.0 | 97.9 | 20.8 | 88.6 |
| 67 | Poland | 149.5 | 157.8 | 56.3 | 64.6 |
| 68 | Portugal | 21.0 | 43.5 | 7.4 | 29.9 |
| 69 | Slovakia | 27.8 | 26.1 | 16.8 | 15.1 |
| 70 | Slovenia | 5.8 | 11.3 | 3.2 | 8.8 |
| 71 | Spain | 124.3 | 276.3 | 40.2 | 192.2 |
| 72 | Sweden | 28.8 | 57.9 | 17.1 | 46.2 |
| 73 | United Kingdom | 105.4 | 377.4 | 37.1 | 309.1 |
| 74 | Switzerland | 12.8 | 52.0 | 6.6 | 45.7 |
| 75 | Norway | 10.2 | 39.2 | 5.9 | 34.9 |
| 76 | Rest of EFTA | 1.4 | 4.7 | 0.7 | 3.9 |
| 77 | Albania | 3.4 | 7.0 | 0.9 | 4.5 |
| 78 | Bulgaria | 36.5 | 32.7 | 17.8 | 14.0 |
| 79 | Belarus | 56.8 | 37.4 | 40.0 | 20.7 |
| 80 | Croatia | 11.5 | 19.3 | 4.3 | 12.1 |
| 81 | Romania | 70.7 | 79.8 | 22.7 | 31.8 |
| 82 | Russian Federation | 907.6 | 791.4 | 339.6 | 223.4 |
| 83 | Ukraine | 357.4 | 166.0 | 239.8 | 48.4 |
| 84 | Rest of Eastern Europe | 4.1 | 7.2 | 2.2 | 5.2 |
| 85 | Rest of Europe | 67.2 | 67.6 | 19.6 | 20.0 |
| 86 | Kazakhstan | 202.5 | 183.0 | 68.9 | 49.5 |
| 87 | Kyrgyzstan | 7.9 | 7.6 | 3.5 | 3.2 |
| 88 | Rest of Former Soviet Union | 67.4 | 53.6 | 29.4 | 15.6 |
| 89 | Armenia | 3.3 | 5.1 | 1.5 | 3.3 |
| 90 | Azerbaijan | 13.1 | 22.1 | 3.2 | 12.2 |
| 91 | Georgia | 4.7 | 8.3 | 2.3 | 5.9 |
| 92 | Bahrain | 1.7 | 5.7 | 0.9 | 4.9 |
| 93 | Iran, the Islamic Republic of | 246.7 | 297.9 | 43.0 | 94.2 |
| 94 | Israel | 19.1 | 40.1 | 8.1 | 29.1 |
| 95 | Kuwait | 14.9 | 37.3 | 4.1 | 26.5 |
| 96 | Oman | 8.7 | 20.6 | 2.3 | 14.2 |
| 97 | Qatar | 16.1 | 29.4 | 6.5 | 19.9 |
| 98 | Saudi Arabia | 87.8 | 153.0 | 23.6 | 88.8 |
| 99 | Turkey | 342.8 | 385.6 | 88.6 | 131.3 |
| 100 | United Arab Emirates | 34.7 | 165.1 | 8.4 | 138.8 |
| 101 | Rest of West Asia | 254.5 | 207.7 | 107.5 | 60.6 |
| 102 | Egypt | 302.0 | 256.0 | 85.9 | 40.0 |
| 103 | Morocco | 97.5 | 104.4 | 18.7 | 25.6 |
| 104 | Tunisia | 38.6 | 24.4 | 25.9 | 11.8 |
| 105 | Rest of North Africa | 112.4 | 130.8 | 31.3 | 49.7 |
| 106 | Benin | 7.0 | 8.7 | 5.3 | 7.1 |
| 107 | Burkina Faso | 9.2 | 10.1 | 1.3 | 2.3 |
| 108 | Cameroon | 9.1 | 9.3 | 2.8 | 3.0 |
| 109 | Cote d'lvoire | 4.8 | 8.3 | 1.7 | 5.2 |
| 110 | Ghana | 15.3 | 25.5 | 3.5 | 13.8 |
| 111 | Guinea | 15.2 | 13.7 | 3.4 | 1.9 |
| 112 | Nigeria | 59.5 | 73.1 | 22.6 | 36.1 |
| 113 | Senegal | 15.7 | 15.6 | 5.7 | 5.7 |
| 114 | Togo | 4.4 | 6.4 | 2.9 | 4.9 |
| 115 | Rest of Western Africa | 34.6 | 45.0 | 9.9 | 20.3 |
| 116 | Rest of Central Africa | 12.7 | 18.7 | 4.1 | 10.2 |
| 117 | Rest of South Central Africa | 21.5 | 29.3 | 9.0 | 16.8 |
| 118 | Ethiopia | 25.0 | 32.3 | 1.9 | 9.1 |
| 119 | Kenya | 21.6 | 25.6 | 6.5 | 10.5 |
| 120 | Madagascar | 53.9 | 47.7 | 8.7 | 2.5 |
| 121 | Malawi | 50.6 | 39.8 | 13.0 | 2.2 |
| 122 | Mauritius | 2.2 | 5.1 | 0.9 | 3.7 |
| 123 | Mozambique | 10.0 | 12.5 | 3.9 | 6.4 |
| 124 | Rwanda | 8.6 | 10.1 | 1.3 | 2.8 |
| 125 | Tanzania, the United Republic of | 18.3 | 20.2 | 5.5 | 7.4 |
| 126 | Uganda | 103.6 | 88.5 | 19.0 | 3.9 |
| 127 | Zambia | 6.5 | 9.2 | 3.2 | 5.9 |
| 128 | Zimbabwe | 22.5 | 16.0 | 12.3 | 5.8 |
| 129 | Rest of Eastern Africa | 19.4 | 35.7 | 4.1 | 20.4 |
| 130 | Botswana | 4.9 | 11.5 | 2.3 | 8.9 |
| 131 | Namibia | 3.8 | 8.1 | 2.4 | 6.6 |
| 132 | South Africa | 617.4 | 376.8 | 294.2 | 53.7 |
| 133 | Rest of South the African Customs Union | 4.9 | 3.7 | 2.2 | 0.9 |
| 134 | Rest of the world | 0.0 | 0.0 | 0.0 | 0.0 |
|  | Total | 24002.4 | 24002.4 | 7236.3 | 7236.3 |

**Table S4.** Budget of average primary fine aerosol concentrations from inter-continental transport of aerosols from each source region to each receptor region, contributions of a region on itself (referred to ‘domestic’) are shown in bold: (a) induced by production of source region [Unit: μg∙m-3]; (b) induced by consumption of source region [Unit: μg∙m-3]; (c) the ratio concentrations induced by consumption to production.

1. induced by production of source region [Unit: μg∙m-3]

|  |  |
| --- | --- |
| 　 Source Region | Receptor Region |
| NA | EU | IN | EA |
| NA | **0.349** | 0.007 | 0.002 | 0.002 |
| EU | 0.001 | **0.773** | 0.005 | 0.008 |
| IN | 0.001 | 0.001 | **2.931** | 0.070 |
| EA | 0.012 | 0.004 | 0.019 | **4.263** |

1. induced by consumption of source region [Unit: μg∙m-3]

|  |  |
| --- | --- |
| 　 Source Region | Receptor Region |
| NA | EU | IN | EA |
| NA | **0.299** | 0.034 | 0.097 | 0.428 |
| EU | 0.017 | **0.631** | 0.121 | 0.383 |
| IN | 0.001 | 0.004 | **2.469** | 0.044 |
| EA | 0.013 | 0.019 | 0.057 | **4.094** |

1. the ratio concentrations induced by consumption to production.

|  |  |
| --- | --- |
| 　 Source Region | Receptor Region |
| NA | EU | IN | EA |
| NA | **0.9** | 5 | 40 | 223 |
| EU | 14 | **0.8** | 27 | 50 |
| IN | 1 | 7 | **0.8** | 0.6 |
| EA | 1 | 5 | 3 | **1** |

Figure S1. Distribution of consumption-based PM2.5 emissions (FCr) in 2007 by mass of emissions in the region.

Tg/y



Figure S2. PM2.5 emissions embodied in imports and exports of the largest net importing/exporting countries/regions. Intermediate goods (gray) are those used by industries in the importing country to further processing and meet consumer demand for domestic goods.

### Bridging PKU-inventory and GTAP classifications

Bridging the two databases was done by setting up concordance matrices between the 78 emission sources and each of GTAP’s countries’ sectors. Let C be such a concordance matrix, holding Cij=1 if PKU-inventory class I corresponds to GTAP sector j, as shown in Table S1.

The original primary fuel type in GTAP database covers coal, oil, coal and oil products, and gas. As the emission factors of various types of fuel vary significant, the coal, oil, coal and oil products were split into seven types of fuel according to the energy statistics from International Energy Agency [1-5]. The coal consumption was divided into Briquettes, coke; Brown coal, peat; Hard coal, coking coal. The consumption of coal and oil products was divided into Heavy fuel oil; Gasoline, aviation fuel, kerosene; Liquefied Petroleum Gas. For some developing countries without country-specific energy statistics, the average proportion of different types of fuels of NON-OECD countries were used. Then the emissions from power generation were split into 2 sectors (Sector 43-44 in Table S5) according to the sectors’ fuel consumption. For example, the emissions from coke used in power generation were C, the coke consumption in Sector 43 and Sector 44 was E1 and E2, then the emissions from coke comsumption in Sector 43 and Sector 44 was and , respectively.

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