

Table SINV-29

International patent families granted in environmental technology, by region, country, or economy: 1998–2020

(Number)

| Region, country, or economy | Economy by income status | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|--------------------------------|--------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| World | na | 4,696 | 5,357 | 4,768 | 4,760 | 5,440 | 5,735 | 6,332 | 6,713 | 7,456 | 7,904 | 7,440 | 7,664 | 8,484 | 10,231 | 11,656 | 12,385 | 12,148 | 13,249 | 15,008 | 14,502 | 14,477 | 14,678 | 16,648 |
| North America | na | 878 | 842 | 791 | 771 | 746 | 718 | 697 | 560 | 632 | 602 | 669 | 728 | 841 | 786 | 858 | 934 | 969 | 970 | 968 | 928 | 851 | 1,011 | 933 |
| Canada | High | 43 | 60 | 61 | 67 | 50 | 54 | 59 | 45 | 49 | 37 | 53 | 54 | 49 | 53 | 64 | 69 | 52 | 64 | 68 | 64 | 59 | 59 | 63 |
| Mexico | Upper middle | 0 | 0 | 0 | 2 | 2 | 1 | 1 | 1 | 2 | 0 | 3 | 1 | 0 | 1 | 3 | 3 | 5 | 6 | 20 | 16 | 11 | 14 | 3 |
| United States | High | 835 | 783 | 730 | 703 | 694 | 663 | 637 | 515 | 581 | 564 | 613 | 673 | 791 | 731 | 791 | 863 | 911 | 900 | 881 | 849 | 782 | 939 | 867 |
| Central America and Caribbean | na | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 2 | 0 | 0 | 2 | 2 | 0 | 0 | 2 | 0 | 1 | 1 | 0 |
| Puerto Rico | High | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| South America | na | 4 | 1 | 2 | 3 | 6 | 6 | 11 | 5 | 6 | 6 | 3 | 18 | 10 | 21 | 23 | 26 | 21 | 22 | 28 | 18 | 26 | 32 | 33 |
| Argentina | Upper middle | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 2 | 1 |
| Brazil | Upper middle | 2 | 1 | 2 | 2 | 4 | 5 | 9 | 4 | 4 | 4 | 2 | 16 | 9 | 16 | 19 | 20 | 17 | 17 | 26 | 12 | 19 | 29 | 32 |
| Europe | na | 1,706 | 1,544 | 1,389 | 1,277 | 1,458 | 1,518 | 1,720 | 1,412 | 1,489 | 1,498 | 1,617 | 1,492 | 1,605 | 1,650 | 1,712 | 1,745 | 1,747 | 1,826 | 1,769 | 1,982 | 1,975 | 1,832 | 1,653 |
| EU-27 + UK ^a | na | 1,134 | 1,093 | 969 | 923 | 984 | 944 | 1,115 | 969 | 998 | 985 | 1,054 | 934 | 1,061 | 1,100 | 1,153 | 1,184 | 1,196 | 1,249 | 1,309 | 1,348 | 1,245 | 1,342 | 1,249 |
| United Kingdom | High | 80 | 63 | 53 | 56 | 79 | 74 | 85 | 76 | 76 | 59 | 64 | 55 | 59 | 73 | 58 | 54 | 59 | 67 | 59 | 79 | 66 | 97 | 85 |
| EU-27 ^b | na | 1,054 | 1,029 | 916 | 867 | 905 | 869 | 1,030 | 893 | 922 | 927 | 991 | 879 | 1,002 | 1,027 | 1,095 | 1,130 | 1,137 | 1,183 | 1,250 | 1,269 | 1,179 | 1,245 | 1,164 |
| Austria | High | 38 | 26 | 29 | 28 | 39 | 33 | 29 | 25 | 37 | 26 | 39 | 31 | 39 | 26 | 33 | 31 | 23 | 31 | 35 | 34 | 36 | 27 | 40 |
| Belgium | High | 11 | 11 | 8 | 13 | 10 | 11 | 13 | 9 | 16 | 10 | 15 | 19 | 11 | 12 | 12 | 17 | 14 | 24 | 33 | 37 | 28 | 36 | 28 |
| Denmark | High | 13 | 11 | 10 | 12 | 8 | 9 | 8 | 12 | 8 | 11 | 12 | 11 | 13 | 11 | 14 | 15 | 13 | 13 | 16 | 18 | 13 | 17 | 16 |
| Finland | High | 25 | 21 | 14 | 19 | 18 | 23 | 30 | 19 | 29 | 17 | 18 | 15 | 22 | 19 | 27 | 28 | 39 | 36 | 37 | 39 | 24 | 36 | 27 |
| France | High | 185 | 184 | 168 | 174 | 170 | 167 | 163 | 133 | 226 | 221 | 213 | 181 | 189 | 253 | 240 | 233 | 252 | 298 | 214 | 220 | 200 | 233 | 253 |
| Germany | High | 405 | 373 | 328 | 321 | 355 | 345 | 387 | 356 | 373 | 401 | 388 | 344 | 372 | 355 | 425 | 446 | 448 | 476 | 470 | 438 | 380 | 428 | 404 |
| Hungary | High | 7 | 11 | 1 | 7 | 11 | 7 | 4 | 8 | 1 | 4 | 8 | 4 | 7 | 8 | 9 | 7 | 4 | 11 | 10 | 7 | 6 | 9 | 4 |
| Ireland | High | 8 | 3 | 3 | 0 | 0 | 1 | 2 | 1 | 4 | 2 | 3 | 2 | 2 | 3 | 2 | 8 | 7 | 3 | 7 | 6 | 5 | 3 | 6 |
| Italy | High | 93 | 117 | 120 | 68 | 67 | 48 | 159 | 94 | 8 | 8 | 11 | 15 | 45 | 47 | 32 | 11 | 11 | 15 | 25 | 134 | 143 | 106 | 71 |
| Netherlands | High | 85 | 67 | 58 | 49 | 54 | 53 | 45 | 35 | 56 | 49 | 59 | 54 | 61 | 66 | 74 | 89 | 55 | 48 | 62 | 70 | 63 | 64 | 72 |
| Spain | High | 34 | 42 | 36 | 40 | 27 | 37 | 48 | 52 | 46 | 54 | 58 | 65 | 77 | 74 | 57 | 69 | 76 | 51 | 79 | 57 | 48 | 45 | 33 |
| Sweden | High | 52 | 50 | 46 | 43 | 52 | 48 | 63 | 44 | 37 | 27 | 35 | 24 | 50 | 43 | 64 | 50 | 44 | 51 | 72 | 63 | 76 | 67 | 67 |
| Other Europe | na | 572 | 451 | 420 | 354 | 474 | 575 | 605 | 443 | 492 | 513 | 562 | 558 | 543 | 549 | 558 | 561 | 551 | 577 | 461 | 634 | 730 | 490 | 404 |
| Other Europe-2020 ^b | na | 651 | 515 | 474 | 410 | 553 | 649 | 690 | 519 | 567 | 572 | 626 | 613 | 603 | 623 | 617 | 615 | 610 | 643 | 519 | 713 | 796 | 587 | 489 |
| Belarus | Upper middle | 3 | 0 | 0 | 2 | 1 | 0 | 5 | 2 | 6 | 4 | 2 | 2 | 2 | 0 | 2 | 2 | 1 | 0 | 4 | 4 | 3 | 2 | 6 |
| Moldova | Lower middle | 7 | 4 | 6 | 8 | 4 | 6 | 11 | 9 | 11 | 15 | 12 | 13 | 18 | 6 | 4 | 2 | 5 | 4 | 2 | 3 | 2 | 1 | 2 |
| Norway | High | 15 | 15 | 13 | 8 | 14 | 19 | 11 | 13 | 12 | 7 | 4 | 6 | 12 | 16 | 15 | 21 | 19 | 20 | 12 | 14 | 13 | 11 | 18 |
| Russia | Upper middle | 500 | 396 | 377 | 297 | 408 | 451 | 407 | 359 | 389 | 400 | 448 | 438 | 424 | 409 | 459 | 434 | 455 | 487 | 373 | 552 | 654 | 434 | 353 |
| Switzerland | High | 24 | 26 | 17 | 21 | 15 | 20 | 21 | 16 | 20 | 17 | 19 | 19 | 31 | 21 | 26 | 26 | 32 | 28 | 29 | 29 | 23 | 29 | 19 |

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|-----------------------------|--------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|--------|
| Ukraine | Lower middle | 21 | 10 | 6 | 17 | 30 | 78 | 151 | 43 | 52 | 68 | 76 | 79 | 54 | 93 | 48 | 72 | 37 | 34 | 34 | 28 | 31 | 7 | 4 |
| Asia | na | 2,041 | 2,816 | 2,457 | 2,590 | 3,099 | 3,355 | 3,758 | 4,619 | 5,242 | 5,702 | 5,058 | 5,340 | 5,928 | 7,692 | 8,972 | 9,566 | 9,322 | 10,349 | 12,154 | 11,494 | 11,537 | 11,710 | 13,931 |
| China | Upper middle | 27 | 34 | 109 | 114 | 153 | 308 | 499 | 565 | 715 | 794 | 962 | 1,492 | 1,590 | 2,908 | 3,897 | 4,350 | 4,535 | 6,489 | 7,929 | 7,181 | 7,553 | 7,554 | 9,894 |
| India | Lower middle | 0 | 0 | 2 | 1 | 2 | 7 | 3 | 7 | 6 | 5 | 6 | 8 | 7 | 10 | 14 | 14 | 20 | 18 | 19 | 23 | 24 | 25 | 22 |
| Japan | High | 1,689 | 1,981 | 1,880 | 1,875 | 2,050 | 2,172 | 2,183 | 2,336 | 2,713 | 2,862 | 2,554 | 2,619 | 2,870 | 3,094 | 3,026 | 2,799 | 2,564 | 2,124 | 2,302 | 2,126 | 1,863 | 1,836 | 1,693 |
| Malaysia | Upper middle | 1 | 0 | 0 | 1 | 0 | 2 | 0 | 2 | 5 | 3 | 1 | 4 | 3 | 7 | 9 | 7 | 6 | 7 | 11 | 14 | 5 | 0 | 1 |
| Singapore | High | 2 | 1 | 2 | 2 | 0 | 3 | 2 | 3 | 2 | 1 | 2 | 3 | 3 | 2 | 1 | 5 | 3 | 5 | 5 | 5 | 5 | 6 | 6 |
| South Korea | High | 281 | 755 | 409 | 534 | 801 | 780 | 997 | 1,591 | 1,689 | 1,939 | 1,450 | 1,141 | 1,378 | 1,585 | 1,911 | 2,246 | 2,043 | 1,554 | 1,682 | 1,942 | 1,940 | 2,123 | 2,189 |
| Taiwan | High | 37 | 46 | 51 | 60 | 89 | 79 | 71 | 110 | 109 | 96 | 80 | 65 | 75 | 85 | 112 | 143 | 148 | 149 | 193 | 190 | 138 | 160 | 121 |
| Middle East | na | 6 | 10 | 11 | 19 | 15 | 16 | 10 | 11 | 9 | 19 | 11 | 19 | 18 | 21 | 22 | 34 | 28 | 37 | 38 | 34 | 41 | 43 | 43 |
| Israel | High | 5 | 10 | 8 | 15 | 10 | 12 | 6 | 7 | 5 | 9 | 8 | 16 | 12 | 14 | 11 | 14 | 18 | 20 | 17 | 15 | 17 | 14 | 18 |
| Africa | na | 15 | 22 | 23 | 23 | 21 | 22 | 20 | 15 | 11 | 16 | 29 | 19 | 34 | 14 | 20 | 28 | 15 | 4 | 9 | 8 | 11 | 8 | 7 |
| South Africa | Upper middle | 13 | 16 | 18 | 18 | 10 | 11 | 16 | 12 | 10 | 12 | 25 | 18 | 26 | 7 | 8 | 15 | 5 | 2 | 3 | 2 | 5 | 3 | 3 |
| Australia and Oceania | na | 39 | 48 | 52 | 64 | 86 | 97 | 112 | 74 | 55 | 56 | 52 | 44 | 49 | 44 | 47 | 43 | 45 | 39 | 37 | 36 | 35 | 40 | 47 |
| Australia | High | 37 | 45 | 48 | 61 | 85 | 94 | 109 | 72 | 52 | 53 | 46 | 40 | 43 | 37 | 40 | 35 | 38 | 31 | 32 | 32 | 31 | 37 | 43 |
| New Zealand | High | 2 | 3 | 4 | 3 | 2 | 2 | 3 | 3 | 3 | 2 | 6 | 4 | 5 | 6 | 7 | 7 | 7 | 8 | 6 | 4 | 3 | 3 | 4 |
| Unclassified | na | 8 | 73 | 43 | 13 | 7 | 2 | 4 | 17 | 12 | 4 | 2 | 3 | 1 | 5 | 2 | 7 | 2 | 3 | 3 | 1 | 1 | 1 | 1 |

na = not applicable, metric not calculated at this level.

EU = European Union; UK = United Kingdom.

^a The United Kingdom was a part of the EU for data purposes from 1973 to 2019.^b Beginning in 2020, the United Kingdom was no longer a member of the EU.**Note(s):**

International Patent Documentation (INPADOC) patent families across all patent offices covered in the Worldwide Patent Statistical Database (PATSTAT) are counted according to the year of the first granted patent in the patent family. Patent families are allocated according to patent inventorship information found on the priority patent of the INPADOC patent families. To account for missing ownership information in PATSTAT for some offices, a method designed by de Rassenfosse et al. (2013) is used to fill missing information on priority patents using information in successive filings within the families. Priority patents not indexed in PATSTAT are replaced by the next utility patent(s) in the families according to filing dates. Patent families are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Patents are classified under the World Intellectual Property Organization (WIPO) classification of patents, which classifies International Patent Classification (IPC) codes under 35 technical fields. IPC reformed codes take into account changes that were made to the WIPO classification in 2006 under the eighth version of the classification and were used to prepare these data. China includes Hong Kong. Data were extracted in June 2021. Because of data coverage issues for some patent offices in PATSTAT, statistics for some countries may be underestimated partially for some years or across the whole trend. Countries with identified issues include India (missing data) and South Africa (no data for 2018). For Italy, because of data gaps regarding information on granted patents, patent applications are used instead, which slightly overestimates Italy's output and creates a small shift in year for which its output is accounted. As patent authorities become more involved with the European Patent Organisation, these gaps should disappear in the future, strengthening the robustness of statistics for these countries.

Source(s):

National Center for Science and Engineering Statistics; Science-Metrix; PATSTAT, accessed October 2021.