World Wind Energy Association

WWEA Annual Report 2024

A Challenging Year for Windpower:

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121 Gigawatt added in 2024, slightly less than the last year
Dramatic 18% decline outside China
Annual growth rate falls from 13,0% to 11,5%
China installs 87 Gigawatt, 72% of new global capacity
Brazil becomes second largest market and joins top 5 wind power nations

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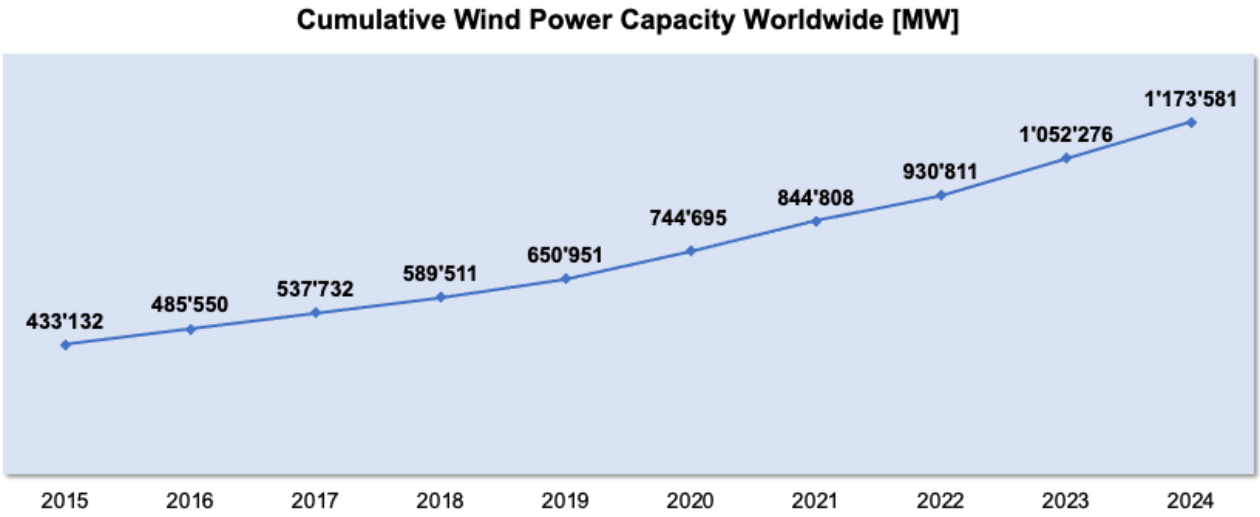
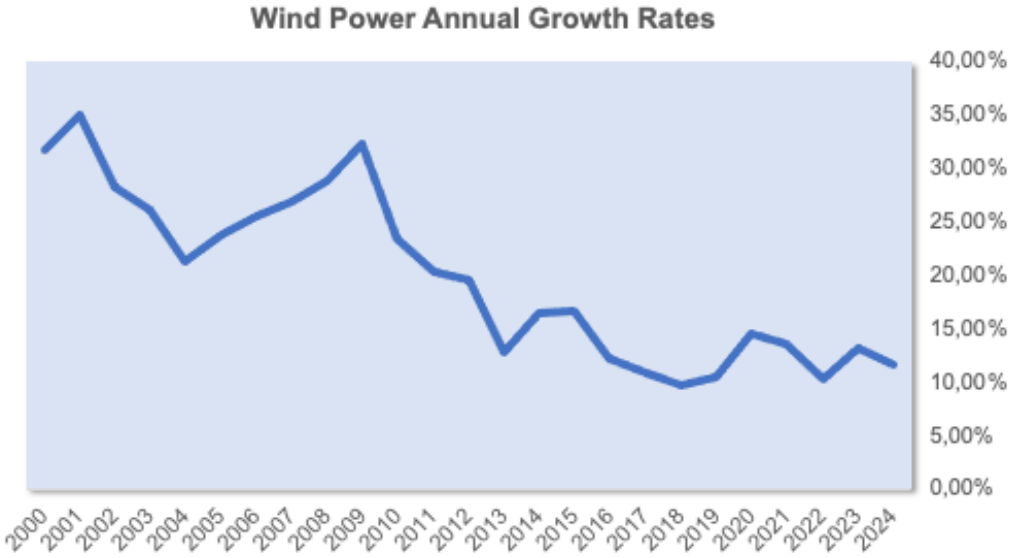
Bonn (WWEA) – In 2024, new wind turbine installations fell far short of expectations, reaching 121’305 Megawatt, slightly less than in 2023, when 121’465 MW were installed. Many of the major markets installed less than in the previous year – in almost half of the top 20 markets, new capacity was lower than in 2023.

According to preliminary statistics published today by the World Wind Energy Association, global wind power capacity has now reached 1’173’581 Megawatt – well below the estimates published by WWEA in autumn 2024.

The world saw a dramatic drop in new installed capacity outside of China: While all countries excluding China installed a total of 42’095 Megawatt in 2023, this fell to just 34’413 MW in the year 2024, a drop by 18%.

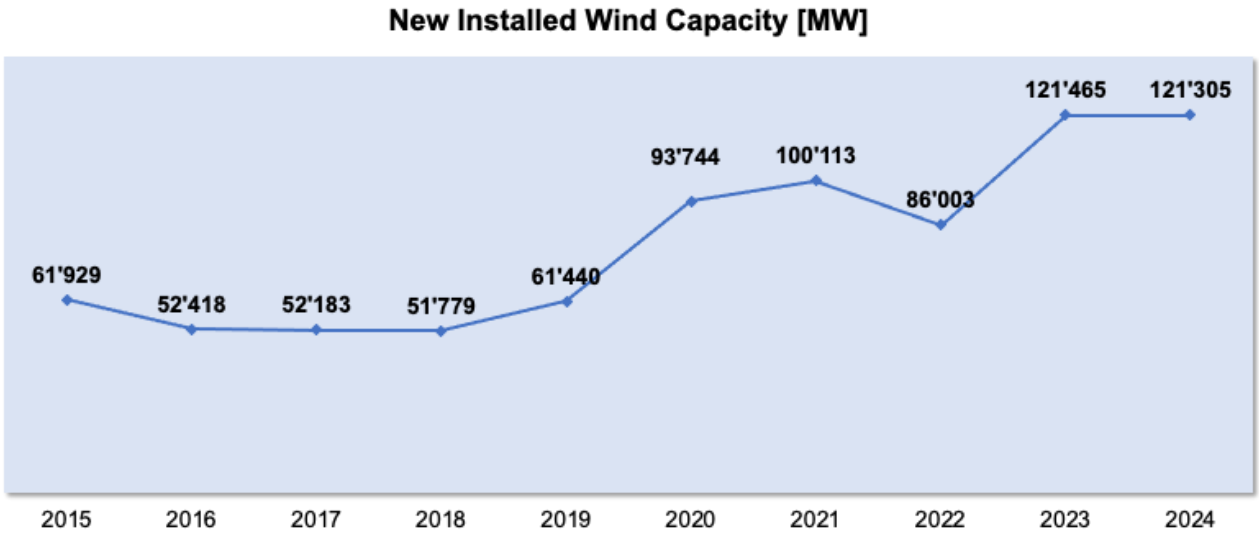


The volume of the capacity added results in a global growth rate of 11,5%, significantly lower than in 2023, when wind capacity grew by 13,0%.



Of the top twenty countries, only five had growth rates well above the global average: China with 18,3%, Brazil with 19,0%, Finland (20,3%), Australia (27,5%) and Argentina (16,6%). Some of the previously very dynamic markets saw a growth of less than 5%: USA (2,8%), Germany (4,6%), Spain (3,9%) and France (3,9%).

The countries with the largest market volume for new wind turbines were in 2024: China (86,7 GW), Brazil (5,4 GW), United States (4,2 GW), India (3,4 GW), Australia (3,3 GW), Germany (3,2 GW) and the United Kingdom (2,2 GW).



Long-term developments: Growth continues but uncertainties emerge

With 1’173’581 Megawatt of installed capacity, the world has reached a new record in total installations although it has fallen short of expectations and forecasts for 2024. It is expected that some of the new installations originally anticipated for 2024 will take place in 2025.

While growth is generally expected in the coming years, driven by new policies, recent developments in the US have created enormous uncertainty not only about the future of the US market, but also about the viability and reliability of international supply chains.

As a result, a tripling of wind power capacity before the end of this decade is not certain for all countries although a tenfold increase by the middle of the century still can be considered a realistic option.

Growing opposition in some countries poses an additional risk to the growth of the wind sector. Misinformation spread by populist movements and interest groups is fueling a difficult debate in some countries about some wind farms, whether onshore or offshore.

It will therefore be crucial to counter fake news with accurate information. It will be essential for wind energy development around the world to follow high standards of community engagement and to ensure that local citizens and communities benefit directly and financially from wind farms in their vicinity. The WWEA Community Engagement Council is working on international guidelines to ensure that best-practice is applied globally.

Share of wind power in electricity generation and consumption

The world's installed wind power capacity now meets well over 10% of global electricity demand – and much more than nuclear power.

More than 30 countries now have a share of wind power above the world average – more than 10%. Eleven countries now generate more than 20% of their electricity from wind, and seven of these have a share of 30% or more: the leader Denmark, which generates more than one in two Kilowatt hours of its electricity from wind, Germany, the United Kingdom, Portugal, the Netherlands, Ireland and Uruguay. These countries demonstrate that the world as a whole can achieve a 40-50% share of wind power in total electricity generation, as outlined by the WWEA in a long-term scenario.

Given the trend towards electrification in the transport and heating/cooling sectors, wind power will play an even greater role in the future of global energy supply. Wind power will also provide the energy to power cars and heat/cool homes.

Barriers to faster deployment

New market uncertainties have been created by the new US administration which has announced that it will halt environmental and climate legislation and revive the fossil industry, including the gas, oil and coal sectors. At the same time, wind projects, both offshore and onshore, have been called into question. New trade barriers have added uncertainty to international supply chains. Although the US global market share in 2024 was only around 4%, it is still too early to understand the potential impact on the global wind power supply chains.

Another long-term obstacle is **fossil fuel subsidies** which continue to severely distort energy markets. After reaching new heights in recent years – due to the fossil energy supply crisis caused the Russian invasion of Ukraine – governments have been very slow to remove these subsidies, which would be essential to create a level playing field for zero-emission renewables.

Time-consuming approval and planning procedures remain another major obstacle. As WWEA noted some time ago, the average planning and permitting process takes more than five years – in some countries ten years or more. Permitting should be kept to a reasonable period of time, under normal circumstances two years should be sufficient.

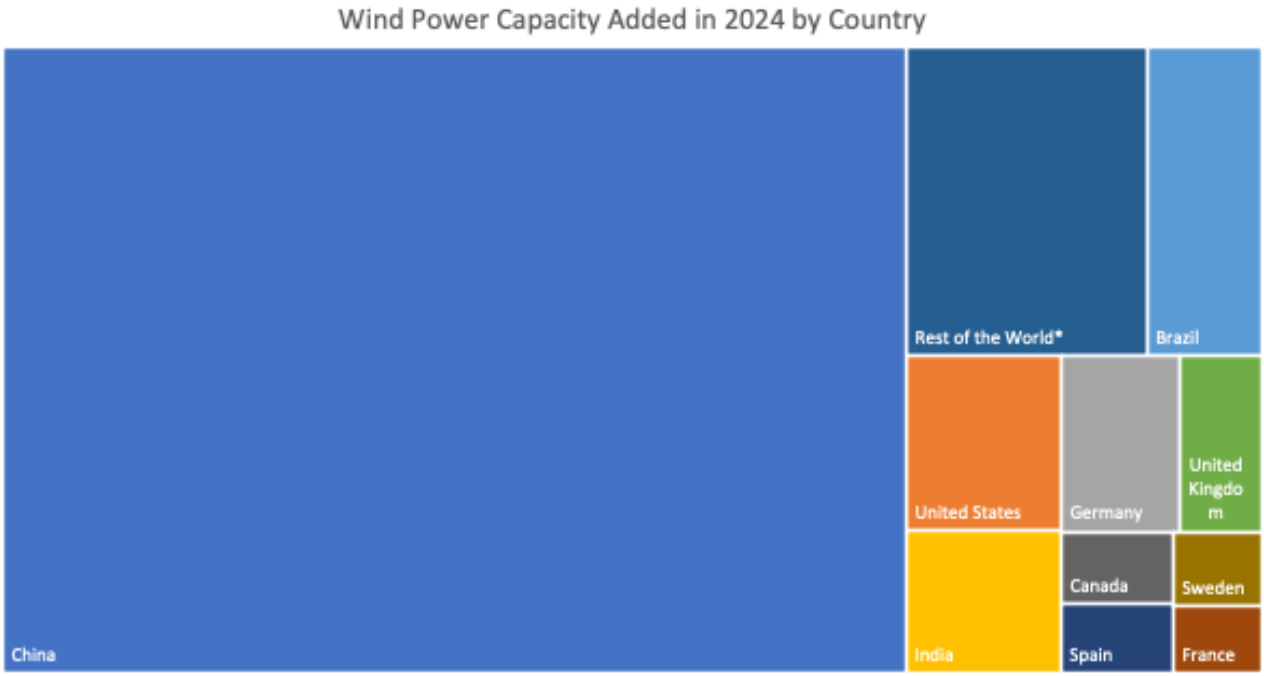
While **good community engagement** goes hand in hand with rapid growth – as local citizens are often active drivers of wind energy development – vocal opposition to wind farms can have a potentially destructive effect, delaying or preventing wind projects. Accordingly, community-based wind is a key driver, as many cases have shown. Based on this understanding, WWEA is currently drafting Community Engagement Guidelines based on practical experience, to be released before the end of 2025.

It is also worth noting that an increasing number of jurisdictions have begun to establish legal standards for this purpose – community energy laws that require wind farm investors to provide certain forms of community benefits, whether in the form of community shares, low electricity prices, payments to the local community, etc. These laws are sometimes called “community energy laws”.

Regional perspectives

ASIA

China passed the 500'000 Megawatt milestone in 2024 and had an installed capacity of 561'492 Megawatt at the end of 2024. This once again underlined China's exceptional role in driving global wind power development – the country added 86'892 Megawatt in 2024, up from 79'370 MW in 2023. With this impressive new capacity, China accounts for 72% of the global market for new wind turbines – a steady increase from 65% in 2023 and 58% in 2022. Although also China also fell slightly short of the expected new capacity of nearly 100 GW, the record cements China's dominant role in global wind power development. With an annual growth rate of 18,3%, one of the highest rates of any major market, China is expected to continue its growth and install even more than 87 GW in 2025.



With an additional 3,4 Gigawatt added in 2024, **India** has maintained its position as the fifth largest market for new wind capacity, just behind Germany, and the fourth largest market for total installations. In the first quarter of 2025, India has reached the milestone of 50'000 Megawatt of installed capacity. Given the country's ambitious targets, India is expected to remain fourth in terms of overall capacity in the coming years. New impetus in India is expected to come from repowering and from offshore wind – which is expected to start in the next few years.

Only one more Asian country can be found amongst the top 20 markets: After several years of stagnation, **Japan** saw significant growth in 2024, increasing its capacity from 5,2 Gigawatt to 5,8 Gigawatt and consolidating its position as the third largest wind power market in Asia. Vietnam remained the fourth largest Asian wind market with nearly 5 GW.

EUROPE

Many European markets showed weaker performance than in 2023, including Germany, France, Sweden, the Netherlands, Poland and Portugal, while fewer countries increased their market size for new installations, namely Spain, Italy, Finland, Denmark and Lithuania.

Germany again leads the way in terms of new installations, with 3,2 Gigawatt, but this is slightly lower than in 2023, bringing the total capacity to 72,7 Gigawatt. In total, only five European countries surpassed the 1 Gigawatt for new installations, down from seven in 2023: Germany, the **United Kingdom** (2,2 Gigawatt new, 32,3 Gigawatt in total), **Finland** (1,4 Gigawatt additional, overall 8,4 Gigawatt), **Spain** (1,2 Gigawatt added, 32 GW in total), and **Sweden** (1 Gigawatt new, total 17,3 Gigawatt).

Medium sized markets in Europe included **France** (909 Megawatt added), **Italy** (plus 865 Megawatt), **Poland** (850 Megawatt added), **Lithuania** (plus 474 Megawatt), **Denmark** (399 Megawatt) and **Ireland** (204 Megawatt).

While the urgency of tackling climate change is undisputed, energy independence and industrial aspirations have become the main drivers of renewable energy development on the continent. As a result, the European Commission and most EU member states have kept renewable energy at the top of the energy agenda.

NORTH AMERICA

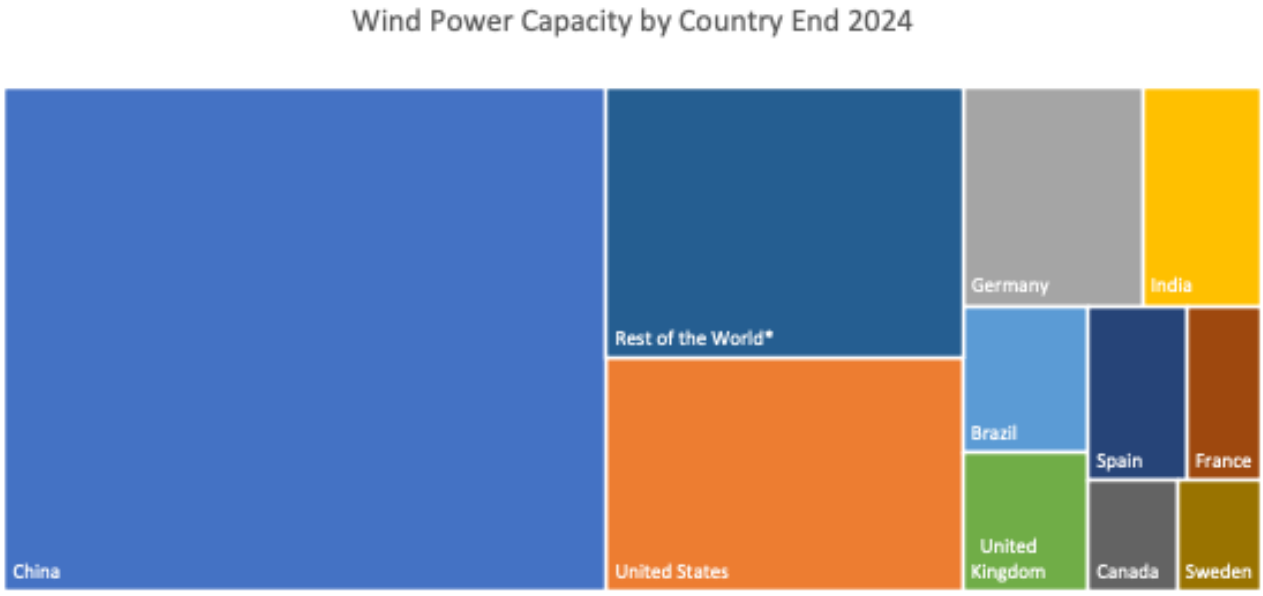
The wind power market in the **United States** experienced in 2024 its slowest growth in more than a decade, adding just 4,2 Gigawatt to reach a total capacity of 155 Gigawatt, down from 6,4 Gigawatt in 2023. As a result, the US market has lost its traditional second position in terms of new installations to Brazil. The future of the US market remains unclear, given the new administration's announcements and decisions affecting land use approvals, the supply chain, the remuneration system and other financial support.

Canada installed 1,4 Gigawatt and now has 18,4 Gigawatt of capacity – also less new capacity than in 2023. **Mexico** reached 8,7 Gigawatt in 2024.

SOUTH AMERICA

Brazil took another big step forward, establishing itself as the world's second largest market for new wind turbines, adding 5,4 Gigawatt of capacity in just one year. With a year-on-year increase in installed capacity of 19%, Brazil again had the highest growth of the top ten wind markets. In terms of total capacity, the country moved from the 7th to 5th place by 2024, overtaking Spain and the United Kingdom. In South America, Brazil is the clear leader in wind power with a total capacity of 34 Gigawatt.

Chile remained as the second largest South American market with a slight increase to 4,9 Gigawatt of installed capacity, followed by **Argentina** (4,3 Gigawatt, 614 MW up) and **Uruguay** (1,5 Gigawatt), a country that has already achieved 100% renewable electricity.



OCEANIA

In 2024, Australia became the fifth largest market for new installations, adding a remarkable 3,3 Gigawatt, and reaching 11th place in terms of overall capacity, overtaking Italy. In **New Zealand,** the total capacity remained unchanged at 1264 MW.

AFRICA

Once again, the African continent saw little capacity added in 2024. **Morocco,** the continent's wind power leader, added 302 Megawatt, bringing total capacity to 2,4 Gigawatt. **Egypt** added a little more, 315 Megawatt, for a total capacity of 2,2 Gigawatt. Many African countries have relatively large proportion of their population living in remote areas without grid access, and are therefore focusing on rural electrification, where small wind turbines can well be used alongside with solar.

WWEA President Dr. Irfan Mirza:

As we close the chapter on 2024, I extend my deepest gratitude to our members, partners, and the global wind community for their tireless efforts during a year marked by both achievements and critical reflections.

While global growth slightly slowed, the steady and inspiring rise of wind power in countries like China and Brazil gives us renewed optimism. China, in particular, has shown extraordinary leadership—accounting for over 70% of new global installations. It is in this spirit that I am pleased to announce that the World Wind Energy Conference 2025 will take place in Shantou, China, this December. It will be a timely gathering to celebrate progress, share knowledge, and strengthen global collaboration at the heart of the world's most dynamic wind market.

This year reminded us that while the journey to 100% renewables is complex, our shared commitment remains resolute. WWEA continues to emphasize the vital importance of community engagement, equitable benefit-sharing, and sound policy frameworks to ensure no one is left behind in the energy transition.

Looking ahead, wind energy will increasingly serve as a cornerstone in hybrid renewable systems, working synergistically with technologies such as solar PV, storage, and green hydrogen. These integrated solutions represent not only the future of energy, but a more resilient, flexible, and sustainable global energy system.

Together, we have laid the foundation for deeper partnerships and more inclusive growth. Let us carry forward the momentum into 2025—with vision, courage, and unity.

WWEA Secretary General Stefan Gsänger:

Wind power, together solar energy, is now widely recognised as the source of electricity for resilient and innovative economies. Seven countries already get a third of their electricty from wind, showing the rest of the world that a renewable future can work. China, with its breathtaking installation rates, is showing the rest of the world that wind power goes hand in hand with a country's industrialisation.

Despite these achievement, too many countries have recently slowed down their wind power deployment. It will be vital for the future of each country to accelerate wind power installations as soon as possible. Permitting processes need to be simplified and shortened. While it makes sense to strengthen domestic supply chains, artificial trade barriers may prevent synergies and slow down deployment.

Finally, and perhaps most importantly, is the role of people: Citizens and communities must play an active role as drivers of this great transformation. They must benefit directly, including economically, from wind farms in their neighbourhood. Governments should enable them to be the driving force we need for a world that aspires to 100% renewable energy.

Country/Region	2024 [MW]	Added in 2024	Growth 2024/2023	2023 [MW]	Added in 2023	Growth 2023/2022	2022 [MW]
China	561'492	86'892	18,3%	474'600	79'370	20,1%	395'230
United States	154'609	4'154	2,8%	150'455	6'402	4,4%	144'053
Germany	72'683	3'209	4,6%	69'474	3'232	4,9%	66'242
India	48'163	3'427	7,7%	44'736	3'136	7,5%	41'600
Brazil	34'000	5'420	19,0%	28'580	4919	20,8%	23'661
United Kingdom	32'360	2'197	7,3%	30'163	1'480	5,2%	28'683
Spain	32'007	1'210	3,9%	30'797	0'639	2,1%	30'158
France	24'383	909	3,9%	23'474	2'559	12,2%	20'915
Canada	18'435	1'449	8,5%	16'986	1'774	11,7%	15'212
Sweden	17'266	1'015	6,2%	16'251	1'973	13,8%	14'278
Australia	15'288	3'299	27,5%	11'989	942	8,5%	11'047
Italy	12'915	865	7,2%	12'050	403	3,5%	11'647
Turkey	12'864	1'058	9,0%	11'806	401	3,5%	11'405
Netherlands	11'720	112	1,0%	11'608	3'393	41,3%	8'215
Poland	10'233	850	9,1%	9'383	1433	18,0%	7'950
Mexico	8'670	360	4,3%	8'310	998	13,6%	7'312
Finland	8'358	1'412	20,3%	6'946	1269	22,4%	5'677
Denmark	7'506	399	5,6%	7'107	158	2,3%	6'949
Portugal	5'938	45	0,8%	5'893	163	2,8%	5'730
Japan	5'840	663	12,8%	5'177	450	9,5%	4'727
Belgium	5'315	0	0,0%	5'315	274	5,4%	5'041
Greece	5'226	0	0,0%	5'226	543	11,6%	4'683
Norway	5'133	3	0,1%	5'130	25	0,5%	5'105
Ireland	4'934	204	4,3%	4'730	203	4,5%	4'527
Vietnam	4'910	0	0,0%	4'910	944	23,8%	3'966
Chile	4'884	84	1,8%	4'800	990	26,0%	3'810
Austria	4'028	139	3,6%	3'889	317	8,9%	3'572
Argentina	4'319	614	16,6%	3'705	396	12,0%	3'309
South Africa	3'560	0	0,0%	3'560	0	0,0%	3'560
Romania	3'077	0	0,0%	3'077	0	0,0%	3'077
Rest of World*	33'464	1'316	4,1%	32'148	2'678	9,1%	29'470
Total*	**1'173'581**	**121'305**	**11,5%**	**1'052'276**	**121'465**	**13,0%**	**930'811**