

RE100

CLIMATE GROUP



Ambition on renewables in the G20

September 2022



in partnership with:





The world is currently on track^[1] for at least a 2.7°C increase in warming by the end of this century.

The Russian invasion of Ukraine has alerted governments to the financial and strategic consequences of our fossil-fuel based economies and [our sluggish approach](#)^[2] to the renewable energy transition.

With the era of cheap fossil fuels now over, the world's leaders need to grasp the opportunities from renewables. A growing chorus of global corporates is calling for greater access to renewable electricity with billions of dollars in investment up for grabs. The countries with the most advanced global economies, the G20, have the responsibility and resources to act and therefore must be at the forefront of this

drive for renewable power, introducing more ambitious renewable energy targets and supportive policies to address climate change. They will be able to continue to take advantage of the huge growth in corporate renewables sourcing and the economic opportunities there are to be seized.

Sam Kimmins,
Director of Energy, Climate Group

The countries with the most advanced global economies, the G20, have the responsibility and resources to act



The role of the G20



Energy-related CO2 emissions make up 80%^[3] of G20 countries' greenhouse gas emissions (GHG). As such, these major economies bear an overwhelming responsibility to act on climate change and showcase leadership in the renewable energy transition. Indonesia holds this year's G20 presidency and has put the sustainable energy transition^[4] as one of its three priority issues for discussion. Demonstrating leadership on this crucial topic will be key to the success of Indonesia's presidency and will pave the way for India's G20 presidency in 2023.



Ahead of this year's G20 conference, Climate Group, an international non-profit, in partnership with REN21, the only global community of renewable energy stakeholders, analysed how the G20 nations (minus the EU and including Spain as a permanent guest of the G20) rank in terms of progress and ambition on renewable electricity in the last decade 2011-2021, where data is available from REN21's Renewables 2022 Global Status Report (GSR)^[5]. Consultancy firm EY's Renewable Energy Country Attractiveness Index (RECAI)^[6] was also used to

showcase the attractiveness of countries' renewable energy markets for investment and corporate Power Purchase Agreements (PPAs).

Taken together, the information provides an overview of the countries' achievements. The report also looks at what G20 countries can do to build on these successes and together advance renewable electricity ambition and progress in the coming years. In addition, the analysis demonstrates the corporate demand for renewable electricity within these countries.

Growing corporate demand

Climate Group's RE100, the global renewable electricity initiative led in partnership with CDP, brings together over 380 global businesses committed to 100% renewable electricity.

RE100's member companies are already responsible for over 390 terawatts (TW per year) of renewable electricity demand – enough to power the UK. Together, they are calling for greater policy change that can remove the barriers to procuring renewable electricity to invest in renewables capacity at scale and source electricity at a cheaper cost.

RE100's latest annual report^[7] released at the start of 2022, found that seven of the top 10 challenging markets for renewable corporate sourcing are within the G20 (Argentina, Australia, China, Japan, the Republic of Korea, the Russian Federation, and Saudi Arabia). Limited or no availability of renewable electricity, lack of procurement opportunities and prohibitive cost are the top three challenges faced by companies.

Last year, the We Mean Business Coalition (WMBC) gathered over 770 signatories in [a letter^{\[8\]}](#) calling on G20 leaders to act on climate change and limit average global temperature rise to 1.5°C.

Together this demonstrates a clear signal to governments that corporates are investing at scale in renewable electricity, but their potential is being hindered by restrictive policy barriers. In 2019, RE100 member demand for renewable electricity represented an estimated USD \$98 billion in investment. Providing access to renewables, at prices that reflect their cost effectiveness, is vital for markets seeking to benefit from the growing corporate investment opportunity.

While each G20 market is different, there are several steps that policy makers can take to ensure that their country, state, province, or region is an attractive place for businesses to adopt renewables.



RE100 has six policy asks that it proposes to governments around the world to encourage the uptake of renewables:



Policy Ask #1

Create a level playing field on which renewable electricity competes fairly with fossil-fuels and reflects the cost-competitiveness of renewables.



Policy Ask #2

Remove regulatory barriers and implement stable frameworks to facilitate the uptake of corporate renewable electricity sourcing.



Policy Ask #3

Create an electricity market structure that allows for direct trade between corporate buyers of all sizes and renewable electricity suppliers.



Policy Ask #4

Work with utilities or electricity suppliers to provide options for corporate renewable electricity sourcing.



Policy Ask #5

Promote direct investments in on-site and off-site renewable electricity projects.



Policy Ask #6

Support a credible and transparent system for issuing, tracking and certifying competitively priced Environmental Attribute Certificates (EACs).

Country rankings

Using collated data, the 20 countries have been ranked from A to E based on their ambition and progress in deploying renewables, in particular renewable power capacities. Some of the areas studied include net zero targets, renewable power target ambition, share of renewables in total installed capacity in 2021, and renewable capacity additions in 2021 – see methodology for the full list of indicators considered.

Leaders		Climbers		Stragglers	
A	B	C	D	E	
Countries with the highest renewables in overall power capacities. Countries have economy-wide renewable targets and/or net zero/carbon neutral strategies.	Countries with high renewables in overall power capacities. No full consideration for economy-wide renewable targets and/or net zero/carbon neutral strategies.	Countries with moderate renewables in overall power capacity deployment. Little or no consideration of economy-wide renewable targets and/or net zero/carbon neutral strategies.	Countries with limited renewables in overall power capacity deployment. Little or no consideration of economy-wide renewable targets and/or net zero/carbon neutral strategies.	Countries with no renewables in overall power capacity deployment. Little or no consideration of economy-wide renewable targets and/or net zero/carbon neutral strategies.	

REN21 Dataset*

Country	Rank**	Ambition		Progress	
		Net zero ambition	Interim targets for renewables	Share of renewable capacity in total installed power capacity 2021	Share of renewable capacity additions as a percentage of total new additions 2021
Germany	A	Climate neutrality by 2045 in law	40–45% by 2025 80% by 2030	60%	100%
China	A	Carbon neutrality by 2060 in policy document	33% by 2025 (18% non-hydro) 40% by 2030	43%	69%
United Kingdom	A	Net zero by 2050 in law	100% by 2035	47%	98%
Spain	A	Climate neutrality by 2050 in law	74% by 2030 100% by 2050	56%	100%
Italy	A	Climate neutrality by 2050 in policy document	55% by 2030	49%	100%
France	B	Net zero by 2050 in law	27% by 2023 33–36% by 2028 40% by 2030	43%	100%
Japan	B	Net zero by 2050 in law	36–38% by 2030	31%	100%
Australia***	B	Net zero by 2050 declaration/pledge	N/A	43%	57%
United States of America	B	Net zero by 2050 in policy document	100% clean electricity by 2035	27%	100%
Turkey	C	Net zero by 2050 in policy document	50% by 2023	53%	100%
India	C	Net zero by 2070 declaration/pledge	50% by 2030	32%	77%
South Africa	C	Net zero by 2050 declaration	41% by 2030****	18%	
Mexico	C	N/A	35% by 2024 40% by 2035	33%	49%
Brazil	D	Carbon neutrality by 2060 in policy document	23% by 2030 (excluding hydro)	83%	87%
Indonesia	D	Net zero by 2060 proposed/under discussion	51.6% by 2030	15%	57%
Canada	D	Net zero by 2050 in law	N/A	68%	100%
Republic of Korea	D	Net zero by 2050 in law	20% by 2030 35% by 2040	17%	77%
Argentina	D	Carbon neutrality by 2050 proposed/in discussion	16% by 2021 18% by 2023 20% by 2025 26% by 2030	35%	96%
Saudi Arabia	E	Carbon neutrality by 2060 declaration/pledge	50% generation by 2030	1%	100%
Russian Federation	E	Carbon neutrality by 2060 declaration/pledge	4.5% (excl. large hydro) 20% generation by 2024 (including large hydro)	20%	99%

* The information is covering data from 2021. Any update from 2022 is indicated in the country descriptions and not included in the ranking calculations. Methodology used is described at the end.

** Ranking comprises REN21 and EY dataset

*** Australia signed its 2050 net zero commitment into law in 2022

**** South Africa is the only country to define an installed capacity target. All other countries have renewable electricity targets



Summary findings

The results of the analysis present a mixed bag of successes and failures. Ambitious renewable targets most often correlate with more progress and make for a more attractive environment for corporate investment in renewable electricity sourcing in G20 countries.

Many countries have shown aspects of leadership – from ambitious renewable targets to PPA markets and policies that welcome corporate investors in renewables. Those countries within the G20 are truly seizing the opportunities renewables present and are constructively engaging with the business community to ensure their renewable commitments and requirements can be met.

Almost all countries fail to be true leaders in our definition and perform consistently across all dimensions of ambition and

progress. By changing policies and energy infrastructures, as well as adequate levels of financing, many countries around the world can significantly increase their attractiveness for corporate sourcing of renewable power. Some highly ranked countries are still connected to investment in new fossil fuels or delays in closing fossil fuel generators, which is completely incompatible with leadership. **Beyond the energy industry, every sector of government needs to lay out how it intends to decarbonise.**

Country snapshots

We analysed the profiles of 10 countries in the G20, highlighting those that are leading the way within the G20 (leaders), those that have made some changes but are not leading (climbers), and those that have a substantial way to go (stragglers).

The country overview data and information related to renewable energy comes from REN21's Global Status Report 2022 unless otherwise specified.

A: The Leaders



Country overview

China ranks number one in the world in terms of installed renewable power capacity with over 1 terawatt (TW) – enough electricity to power all of Europe, or India twice over. In 2021, the Government installed 124 gigawatts (GW) of renewable capacity alone. China has doubled new renewable electricity capacities between 2011 and 2021. Now nearly 69% of new power installations are renewable. While this is behind the other leaders in the research, the Government plans to invest USD \$350 billion during 2021–2025 to upgrade its grid to achieve better compatibility with renewables. Its overall investment in renewables increased 32% in 2020 to USD \$137 billion.

China aims to have renewable electricity make up 33% of its electricity requirements by the middle of this decade and 40% by 2030. In 2021 China accounted for 43% of all globally installed bio-power, hydropower, solar photovoltaics (PV), and wind power.

According to EY, China is the second most attractive market for renewable energy investments, after the US. It maintained this position from 2021. The country however does not appear in the top 30 markets ranked by EY for PPAs, showing the amount of work that needs to be done in corporate renewable sourcing policies if China is to attract more private investment.

Current landscape and opportunities:

Despite the growth in renewables, its power sector is still overwhelmingly dependent on fossil fuels. In the past decade, efforts have been made to double installed renewable electricity capacities. While overall progress is good, the ability for corporations to invest in renewables is more limited. China has been repeatedly cited by RE100 members as one of the leading countries where they face barriers to corporate sourcing of renewable power. Limited availability and regulatory barriers are the biggest hurdles faced by corporates operating in China.

In 2018, manufacturing accounted for nearly 30% of China's total economic output – almost USD \$4 trillion^[9]. Within the latest RE100 annual report^[7], manufacturing sector members have a greater electricity consumption in China than they do in all other markets combined. **Increasing access to PPAs could improve the manufacturing sector's access to procurement.** As manufacturing facilities are likely spread over fewer sites, the potential to significantly impact their local grids is enormous.





Country overview

Spain has set out to deliver one of the most ambitious renewable power policies in the European Union. Spain has consistently ensured that all new power capacity additions over the last decade have come from renewables. The country surpassed its 2020 target of 20% renewables in its total final energy consumption (TFEC), hitting over 21%. Spain plans to increase this to 43% by 2030 and 97% by 2050 when it's due to reach its legally binding climate neutrality goal.



In the habit of surpassing its targets, Spain aimed to have 40% of its electricity requirements coming from renewables in 2020. It surpassed this with 46.1%. The country has some way to go to achieving its renewable electricity target of 74% by 2030. To help achieve this, Spain held its first solar and wind capacity auction - where the Government issues a call for tenders to install renewables - in January 2021 and again in October of the same year. The two rounds auctioned off 6,300 megawatts (MW) of installed power^[10].

According to EY, Spain ranks 9th on its RECAI matrix, up one place from last years' score. The country maintained its number one rank in EY's PPA index. Spain contracted more than 2.3 GW in 2021 through PPAs, the highest number in Europe^[11].

Current landscape and opportunities:

Spain's renewables market is recovering from policy changes last year that saw windfall taxes imposed on energy companies. **Spain should look to increase the share of renewables in its total final energy consumption**, standing around 17% as of 2019. Boosting its capacity additions will help to improve its standing. As it makes improvements to reach its 2030 target, Spain will climb up EY's RECAI score, becoming a more attractive market for renewable energy investments.





To ensure sustained growth in renewable electricity, the UK must focus on continuous expansion of solar PV and wind, instead of fossil fuel projects.



Profile: United Kingdom (UK)

Country overview

The UK is among a small group of ambitious leaders in the G20 with a net zero emission by 2050 target enshrined in law. It was the first country in the world to do so.

The UK has increased the share of renewable energy in its TFC in the past decade reaching 15% in 2019. It however fails to include a future TFC target.

The UK ranks 13th worldwide in terms of renewable power capacity with 50.1 GW by the end of 2021. It has set itself a clear ambition path and aims to fully decarbonise its electricity by 2035 – which includes the use of nuclear power to do so. In 2021, the UK registered 53% of variable renewable electricity (VRE) generation from both solar and wind, one of the few countries to have reached this high level.

The UK commissioned some fossil fuel power generations in 2021, leading to renewable electricity capacity additions to slip to nearly 98%. Among the renewable power additions in 2021, the country added 2.6 GW – mostly offshore wind – for a total of 26.8 GW of installed capacity. The solar PV market continued to experience consistent, unsubsidised growth, driven by higher gas prices.

Sitting third on EY's RECAI score, having climbed two places on 2021, the UK also ranks fourth on the PPA index, up from seventh in the previous. EY points to high

wholesale energy prices and increased capex costs as having led to the price of PPA's rising. Despite this, the corporate market demand continues to grow with 52 RE100 members now headquartered across the UK.

2022 update

The Government's Committee on Climate Change's^[12] report in June found "major failures in the delivery programmes towards the achievement of the UK's climate goals." The report laid out that the UK will not achieve its 2050 net zero target without significant support for renewables.

Current landscape and opportunities

To ensure sustained growth in renewable electricity, the UK must focus on continuous expansion of solar PV and wind, instead of fossil fuel projects.

As already identified by the UK Government, the investment in other renewable technologies needs to be accelerated. The Government has committed to invest £20 million (USD \$23.5 million) annually into tidal stream electricity^[13] to drive technology development, lower costs and make tidal power as competitive as offshore wind.

B-C: The Climbers



Profile: Australia

Country overview

With a commitment to reach net zero emissions by 2050 and having met its 2020 Renewable Energy Target, Australia has room to grow its federal ambition on renewable electricity. The country has slightly increased the renewable share in its TREC in the past decade, representing around 10% in 2019. Despite this, Australia has been backsliding in the total renewable

electricity capacity additions it has made in the 10 years up to 2021, with 57% of new capacity additions in 2021 coming from renewables, down from 78% in 2011.

In 2021, Australia ranked 8th in the world for wind power installation, adding 1.7 GW. Australia also ranked 8th for solar PV additions, adding 4.6 GW - mostly driven by the rooftop sector. In 2021, Australia also set a new global record of 1 kilowatt (kW) of



Bringing in interim targets to support its mature renewables market will ensure greater investor confidence

installed solar PV per capita, which was 31% higher than in the runner-up country the Netherlands (0.765 kW per capita).

Australia ranks 14th worldwide in terms of renewable power capacity with 41 GW by end 2021. In 2021, Australia registered 40% of renewable electricity generation from both solar and wind, one of only a handful of countries to have done so.

The country has increased its attractiveness as a market for renewable energy investments over the past year. According to EY's RECAL score, Australia moved up one place to 6th while maintaining its position at 5th on EY's PPA market.

2022 update

Australia has pledged a 43% cut below 2005 levels by 2030. Describing 2030 as "a floor, not a ceiling", the pro-climate Government of Anthony Albanese was a welcome sight to many in Australia looking for stronger renewable targets at a federal level.

Corporate RE100 members continue to develop new renewable electricity capacities. RE100 member Apple recently agreed to buy 500 GW^[14] from a new wind farm being built in north Queensland, further demonstrating the corporate demand for renewables.

Current landscape and opportunities

While federal guidance on climate ambition has been missing for several years, the state and regional level has not been idle. Each of Australia's states outperformed the federal Government^[15] in leading the push for renewables. For example, over the last 15 years, South Australia^[15] has transitioned away from coal, with more than 60% of its electricity powered by renewables.

The 2021 RE100 annual report found that nearly a quarter of Australian members cited barriers to accessing renewables. Cost proved to be the biggest barrier. Moving forward, **the Government should look to ensure that its high levels of renewable power are operating on a level playing field with fossil fuels, helping to bring down the cost for businesses.**

An area where this could be most effective is in the significant increase in solar capacities. Last year, it was estimated that Australia's solar PV capacity could reach 80 GW by 2030 with an additional potential of 179 GW of rooftop solar. High rooftop solar use has however challenged the stability of the grid, leading some jurisdictions to introduce export limits and remote disconnection in 2021.

With Australia's high numbers of installed renewables, the level of ambition must be increased to match its progress with roadmaps of interim targets and financial investment. **Bringing in interim targets to support its mature renewables market will ensure greater investor confidence** and see a potential rise in EY's RECAL and PPA rankings.



Profile: India

Country overview

India has pledged to meet 50% of its energy requirements from renewables^[16] by 2030. India ranks fourth in the world for installed renewable power capacity with 158 GW, and third globally for renewable power capacity additions in 2021 with 15 GW. India has more than tripled its renewable electricity capacity additions in the space of a decade, moving from only 20% in 2011 to nearly 77% in 2021.

Following two years of contraction, annual solar PV additions in the country underwent substantial growth in 2021 with an additional 13 GW installed. New capacity in India included around 9 GW of utility-scale solar (large-scale, centralised systems connected to the grid) and nearly 3.4 GW of distributed generation, with the

rest being off-grid applications. Distributed rooftop solar installations add up to around 17% of the total solar market.

In addition to solar PV, wind power is also a contributing factor in India's energy mix. Nearly 1.5 GW was installed last year, for a total onshore wind power capacity approaching 40.1 GW

Total new investment in renewables increased 70% to USD \$11.3 billion in 2021. Notable jumps were seen in solar PV (up 68% to USD \$7.5 billion) and wind power (up 92% to USD \$3.4 billion).

EY's RECAL scoring saw India fall by four places in the past year down to seventh. Analysis shows that India's wind sector has been facing stiff competition from the solar sector, meaning it will likely miss its 60 GW installation target for 2022. The country also dropped by eight places to 14th on EY's PPA index.

2022 update: According to EY^[6], the Indian Government's Green Hydrogen Policy aims to produce a cumulative 5 million tonnes of green hydrogen by 2030. It has entered into a joint task force with the United Arab Emirates to help both markets to scale green hydrogen technologies. With total new investment in renewables reaching USD \$11.3 billion, India's Government and businesses in the country have substantial opportunities to access cleaner electricity.



Current landscape and opportunities

There are clear signals from the central Government ministries that India is set for an imminent increase in renewables. This execution however is not centrally controlled and most of this lies within the 28 states, many of whom are struggling to meet the demands because of power distribution companies (DISCOMs) grappling with debt. By adopting supportive policies and bringing in ambitious targets, accompanied by a clear roadmap and investment plan, it opens itself up to wider investment from domestic and international businesses. Assistance must be forthcoming for those states that are delivering supportive regulations but are held back by struggling DISCOMs.

REN21's Renewables Global Status Report^[5] cites low tariffs and rising costs as reasons for several businesses surrendering capacity after being awarded PPA's.

The high capital costs and grid connection challenges need to be addressed for India to reach its 2030 targets. Financial support for renewable energy projects dropped by nearly 45% between 2017 and 2020, while subsidies for fossil fuels continued unhindered.

Power consumers in the Indian state of Maharashtra can now opt for 100% renewable electricity. They can do this because of an order issued by the Maharashtra Electricity Regulatory Commission (MERC), following a petition filed by Tata Power, directly acknowledging the role of RE100 and its members in pushing for greater access to renewables.

As the 2023 G20 Presidency, India has a significant opportunity to demonstrate leadership by setting more ambitious net zero goals and energy policies.



Country overview

Japan lacks many of the required benchmarks along its renewables journey to make a meaningful plan for its net zero future. Despite having net zero by 2050 enshrined in law, Japan only plans to have renewables make up 36-38% of its energy mix by 2030, with coal still accounting for 19%^[17]. In 2021, 100% of the new power capacities added to the grid were from renewables, up from just 26% in 2011. As of 2019, renewables in Japan's total final

energy consumption amounted to less than 8%. Japan ranks 6th worldwide in terms of renewable power capacity with 110 GW.

Japan remained level on EY's RECAI Index from last year at 8th and was a new entry to its PPA Index, at 28th. Previously, policy barriers meant that PPAs were not suitable for sourcing renewables in Japan, according to EY's analysis.



Current landscape and opportunities: Outlining its Clean Energy Strategy^[18], the Japanese government has not considered how to fully retire its domestic coal use, looking instead to reduce its dependency from 26% to 19% by 2030. With plans for reliance on coal and liquefied natural gas (LNG) in the 2030 power mix, the Government also looks to rely heavily on technological innovations like ammonia co-combustion that lack practical applications, at least right now, to help mitigate these GHGs. Meanwhile, renewable electricity looks set to grow through new offshore wind projects, corporate PPAs and upgrading power grids. Despite this, the ability to freely choose the electricity supplier and services businesses require appears to be limited. There is also a concern that the reduction of diversity in renewables will lead to energy security issues.

RE100 annual reporting suggests that the limited supply of renewables, and their high costs are stopping many businesses from adopting ambitious renewables targets. Despite this, Japan has the second highest number of RE100 members with businesses like Sony, Asahi and Fujitsu putting their voices together to build pressure on the Government to play its part in increasing renewable electricity deployment and availability. RE100 was mentioned by Japan's Ministry of Economy, Trade and Industry (METI) in its measure to subsidise solar PPAs. The Japanese Government will cover 50% of the cost of construction for power plants developed for PPAs.

Implementing a nationwide carbon tax^[19] or emissions pricing scheme has the potential to persuade major emitters to reduce emissions through incentives. Revenues from this tax, can be reinvested into delivering greater opportunities for renewables.



South Africa

Country overview

South Africa ranks 42nd worldwide in its renewable power capacity with 9.5 GW. In 2020, 11% of South Africa's installed capacity was renewable, with a goal of increasing that to 41% by 2030. Renewable power in South Africa's TREC grew from 2% to 4% between 2009 and 2019.

While slipping one place on EY's RECAI matrix to 35th compared to 2021, the country climbed eight places on EY's PPA Index to 20th, showing the market is opening itself up to more corporate renewables' buyers.

Ensuring jobs are protected during the transition will be essential to the success and reception of renewables in the country.

Current landscape and opportunities

Owing to its heavy reliance on fossil fuels, South Africa's move towards renewables must be completed in tandem with a just transition. The [International Monetary Fund](#)^[20] has shown that the cost of renewable energy in South Africa has significantly declined and is now operating on a competitive level with coal. **Ensuring jobs are protected during the transition will be essential to the success and reception of renewables in the country.** At COP26 the Just Energy Transition Partnership with the EU, France, Germany, the UK, and the US was established to help South Africa move away from its overreliance on coal which makes up more than 70% of the country's energy supply and 86% of its electricity generation.

In 2021, RE100 launched its country hub in partnership with the National Business Initiative (NBI) and World Business Council for Sustainable Development (WBCSD), entitled RAiSE – Renewable Ambition in South African Electricity. More than 50 companies with operations in South Africa have already committed to procure 100% renewable power by 2050 or sooner through the RE100 initiative. As RE100's hub and membership grows, it will work with South African headquartered companies to understand the specific policy environment in the country and how this can change to enable greater access to renewables.



D: The stragglers



Brazil

Country overview

Brazil is a country with an electricity mix that is highly based on renewables. 4 GW of distributed solar was added last year, leading the market in newly added capacity. Closely following was 3.8 GW of installed onshore wind, now totalling over 21 GW. Brazil has set 2060 as its year for reaching net zero with a target of between 45%-50% renewable by 2030.

Despite this, the country had no target for renewables in TFEC in 2020 and only increased its share by less than 1% between 2009 and 2019. The country also slipped on the addition of renewable electricity



capacities between 2011 and 2021. While Brazil's use of renewables meets almost 45% of its final energy demand, there are significant negative factors in the country's approach to climate change.

Brazil has seen both its RECAI and PPA Indexes fall over the past year, ranking 13th in both aspects with a four and two-point decline, respectively.

Current landscape and opportunities

According to the [Climate Action Tracker](#)^[21] (CAT) Brazil's climate targets are 'highly insufficient' and more closely aligned with 4°C of warming.

[Research has shown](#)^[22] there are a number of barriers to the adoption of wind energy in particular. With a highly regulated and complex electricity market, the Government needs to make substantial changes to promote capital investment while introducing long-term energy programmes that surpass changes in Government. **Brazil's energy infrastructure must make more headway in its support for diversifying renewables.** With heavy reliance on hydropower for its renewable electricity, Brazil will become increasingly exposed to droughts that threaten the supply of electricity. This has been acknowledged by the Brazilian authorities and system operator in 2021.



Canada

Country analysis

Canada has been stagnating over the past decade in the percentage of renewables that make up its TFEC. In 2009 this was at 25.8% but slipped to under 25% by the end of 2019. While having net zero by 2050 in law, the country lacks any interim dates for renewable power or electricity targets to provide guidance and checkpoints along the way.

All new power capacity additions between 2011 and 2021 were from renewable energy sources, and in 2021 renewable electricity provided nearly 69% of Canada's electricity demand. Canada has an abundance of hydropower in some provinces, such as Quebec which supplies more than 100% of its electricity needs through hydropower and wind. Those that don't have this access rely on carbon-intensive power generation.

Canada increased its ranking on EY's RECAI Index by two places compared to last year, up to 16th but fails to make the top 30 countries on its PPA Index.

Current landscape and opportunities

Despite Canada's energy regulator saying additional oil pipeline capacity is not required to meet demand, it continues to expand, jeopardising the transition away from fossil fuels and increasing stranded assets. [Clean Energy Canada](#) [23] has estimated that fossil fuels jobs are on track to drop 9% while those in clean energy will grow by almost 50% by 2030. Successive Canadian Governments must put in place policies that protect workers in fossil fuel industries and allow them to transition towards clean energy roles.



According to the [International Energy Agency](#)^[24], **Canada must develop clear policies to attract energy sector investments to align with a shift to renewables.** As an energy security provider to many countries, Canada must ensure that its energy sector is aligned to other countries demands for clean energy, rather than locking itself and its buyers into fossil fuels.

Canada unveiled significant climate policies in 2021, including increasing its carbon price, new methane emissions reductions for the oil and gas sector and clarifying its stance on thermal coal mining. By implementing all of these policies, Canada can ensure that it secures its position as one of the leaders in the clean energy transition.

Like Brazil, **Canada must ensure that it diversifies its green energy system, which is heavily reliant on hydropower.** As the effects of climate change cause droughts across many parts of the world, the certainty of hydropower looks to be challenged. By taking advantage of the abundant sources of renewable power, and its huge landmass, Canada can significantly diversify its renewable use and lead the way as a green powerhouse.



Profile: Indonesia

Country overview

Indonesia plans to secure 51% of its electricity requirements from renewables by 2030 as it discusses a 2060 target for net zero. There has been some substantial movement in the previous decade away from fossil fuels in new power capacity additions which made up 95% in 2011 dropping to 44.5% by 2021. It has recently become one of the few countries outside the EU to define targets for its TFEC, pledging to increase the share of renewables in its overall TFEC to 23% in 2025 and 31% in 2030.

Indonesia is leading the way in biodiesel, where it increased production 11-fold since 2011 to more than 8 billion litres in 2021, and geothermal power which supplied 15.6 TW, or 5.3%, of the country's total generation in 2020.

Absent from both EY's RECAI and PPA Indexes, the country misses a number of key ambitions to encourage corporate investment in renewables.



2022 update

As the President of the G20 this year, Indonesia has positioned the sustainable energy transition as one of its key priorities. It will be essential the summit does not become a platform for the promotion of gas as a bridging fuel. It is also imperative that Indonesia showcases leadership by investing in energy sources that make the most sense for its long-term economy and sustainability.

Current landscape and opportunities

Indonesia is the world's fourth largest producer of coal with more than 80% of its electricity generation coming from fossil fuels. This leaves Indonesia's power sector as one of the most carbon intensive on the planet. State-owned utility PLN has promised to stop building coal-fired power plants by 2023^[25] but this fails to take into account the ongoing programme to add 42 GW to the national grid, powered mostly by coal. Only once these projects are completed has the company committed to focusing on renewable energy, locking the country into fossil-fuel power generation for decades to come.

Indonesia needs to ensure that it sets up a comprehensive financing system to attract investment for renewables. There are currently a number of factors that make the country unwelcoming to renewables investment. These include high capital expenses for renewable project developments, especially geothermal, regulatory barriers, limited green financing and a lack of incentives to increase corporate sourcing.

Setting more ambitious interim targets for renewables in its electricity mix and its TFEC, accompanied by roadmaps and investment, will be important to the country's movement away from fossil fuels.

Conclusion

For all countries, the key task that emerges is to align their high-level renewable ambition with developments on the ground, including a strong corporate sourcing movement, to keep incentivising changes to the grid.



“Renewables are central to business efforts to achieve zero emissions or other ambitious emission reduction goals. For some, the drive to increase the use of renewable energy is part of larger environmental goals and, often, a fundamental element of a broader sustainability strategy. Stakeholders such as customers, workers, local communities, suppliers and shareholders increasingly expect companies to play their part in climate action and to become more accountable as well as more publicly transparent about their sustainability practices.

Rana Adib, Executive Director, REN21

For the leaders, those showing high ambition and progress, more is needed in the form of **roadmaps, supportive policies, renewables investment** and plans to enhance **energy security**. The climbers and stragglers need to **show greater ambition and progress** on reaching their targets. Countries with already high shares of renewable electricity, like Canada and Brazil, can demonstrate their leadership in the G20 and beyond by **setting roadmaps, investment plans, more ambitious interim targets** and **increasing renewable diversification across sectors**.

Financing the transition remains one of the main considerations across the G20. According to Energy Policy Tracker^[26], since the start of 2020, the G20 has committed at least USD \$470 billion to supporting fossil fuel energy. In contrast, USD \$424 billion has gone to supporting clean energy. Renewables have repeatedly proven themselves as the cheaper, fairer energy

source. Almost two-thirds, or 163 GW, of new renewable power capacity added last year had lower costs than the cheapest coal-fired power plants in G20 markets, [reporting^{\[27\]}](#) by IRENA showed. Corporations and financiers have the capital to invest in renewables but are being held back by policy environments in the countries they operate.

As eyes turn to India as the 2023 G20 presidency, the steps laid out in this report provide a strong foundation for progress towards net zero. Looking towards next years' rankings, expect possible changes seeing several members move up the A-E ranking as they introduce new plans, and their ambition turns unequivocally into progress.

There is now less than ten years to halve emissions to prevent the disastrous levels of global warming. Commitments will not deliver themselves. It is now time to act.

Methodology

The scoring, defined by REN21, compares the countries progress and ambition in the deployment of renewable energy and in particular renewable power capacity. Using the latest available information, the progress and ambition in the latest decade (2011-2021) has been evaluated for the following five indicators:

Ambition

1. Net zero emissions targets: Identifies the level of commitment of countries based on their policy status for net zero emissions or carbon neutral objective. It is based on the latest information REN21 could identify by early 2022.
2. Renewables targets in total final energy consumption: Based on the definition of renewable energy targets in the total energy consumption for 2020, their achievement, and the existence of future targets in the total final energy consumption.
3. Renewable electricity generation targets: Based on the definition of renewable power targets for 2020, their achievement, and the existence of future renewable power targets.

Progress

4. Share of renewables in total final energy consumption: Based on latest available IEA data, REN21 has calculated the share of modern renewables in the total final energy consumption for the years 2009 and 2019.
5. Renewable power capacity share and additions: Based on available data from IRENA, REN21 has calculated at a country level the share of renewables in total power capacity and the share of renewables new capacity in the total new installed capacity. The progress has been evaluated between 2011 and 2021.



Some of these data sets are available in REN21 2022 GSR report^[5] on which our country analysis is predominantly based. The table represents a snapshot of some of the most relevant data used for analysis.

In our analysis we have also considered EY's RECAI score^[6] to account for macro

stability and investment climate, energy market trends, policy, project delivery and technology.

In our country snapshot analysis we used EY's PPA Index^[6] where applicable as a barometer of corporate sourcing opportunities in the country for 2022.

Disclaimer for REN21 methodology

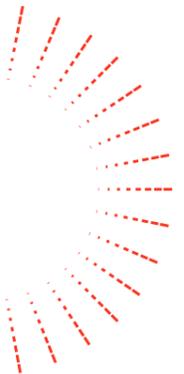
The evaluation of the G20 countries is a comparative exercise that considers the information available to REN21 at the time of this calculation.

Limitations:

- Data is not available for all the indicators for the same periods. Some data is available for the 2009-2019 or 2011-2021 period where noted.
- Information was gathered to the best of our knowledge using the data available.
- Data included represents exclusively national or federal targets (ambition) and progress. In recent years, several

sub-national and local initiatives have pushed for ambitious targets and have deployed renewables across the energy mix, including the power sector.

- It is based on installed power capacities and does not consider the projects that are in the pipeline and the permitting process delays.
- Data is not systematically available for 2021. In some cases such as total final energy consumption (TFEC) data from 2019 has been used.
- The EU was not included in the analysis. The countries within the G20 and the EU were analysed.



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About Climate Group

Climate Group drives climate action. Fast. Our goal is a world of net zero carbon emissions by 2050, with greater prosperity for all. We focus on systems with the highest emissions and where our networks have the greatest opportunity to drive change. We do this by building large and influential networks and holding organisations accountable, turning their commitments into action. We share what we achieve together to show more organisations what they could do. We are an international non-profit organisation, founded in 2004, with offices in London, New Delhi and New York. We are proud to be part of the We Mean Business coalition. Follow us on Twitter @ClimateGroup.

RE100

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About RE100

RE100 is a global initiative bringing together the world's most influential businesses committed to 100% renewable electricity. Led by [Climate Group](#), in partnership with [CDP](#), our mission is to drive change towards 100% renewable grids, both through the direct investments of our members, and by working with policymakers to accelerate the transition to a clean economy. The initiative has over 370 members, ranging from household brands to critical infrastructure and heavy industry suppliers. With a total revenue of over US\$6.6 trillion, our members represent 1.5% of global electricity consumption, an annual electricity demand higher than that of the UK.



About REN21

REN21 is the only global renewable energy community of actors from science, governments, NGOs and industry. We provide up-to-date and peer-reviewed facts, figures and analysis of global developments in technology, policies and markets. Our goal: enable decision-makers to make the shift to renewable energy happen – now. www.ren21.net