

May 2016

Allianz Climate and Energy Monitor

Assessing the needs and attractiveness
of low-carbon investments in G20 countries



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Allianz Climate Solutions is the competence center of Allianz Group for climate change and renewable energy. We offer insurance and advisory services on financing issues for renewable energy projects to both external clients and Allianz entities. Furthermore, we are responsible for climate-related advisory and strategy development of Allianz and are an incubator for climate-related product development.

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Foreword



Climate change threatens the stability of both our planet's biosphere and our economic and financial structures. The risk of inaction is too costly to ignore and it is a risk we cannot insure against. The only way to reduce our risk from climate change is through immediate and urgent action.

Last December in Paris, governments of the world took a significant step to reduce this risk by adopting the Paris Agreement. This historic agreement sets the course towards limiting global temperature rise to less than 2 degrees Celsius – and better pegging it to 1.5 degrees C – and achieving a balance between our emissions and the planet's ability to absorb those emissions, a balance known as climate neutrality.

These aspirations are built on a foundation of national climate change action plans. With an agreed framework for increasing resilience and reducing emissions, the Paris Agreement is our opportunity to transform growth and development to a sustainable model that avoids greenhouse gas pollution and the attending challenges.

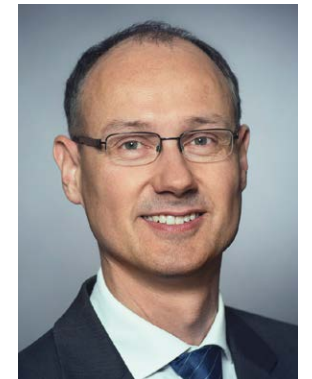
Now, the private sector – enterprise, investment and insurance – must respond to the strong signal sent in Paris. Across all sectors of the economy from energy to transport to industry to agriculture, we must open low-emission development pathways and we must already today be ensuring no project goes forward unless it is consistent with the Paris Agreement's temperature goals.

These pathways are opened through efficient, sustainable business practices, a shift in capital towards clean energy, and responsive insurance products that proactively anticipate how climate impacts will affect communities and countries. This is the critical path to environmentally and socially responsible growth, the vision laid out in Paris.

The countries in the G20 have a responsibility to lead the transformation towards this vision of growth. They must forge partnerships and practices with the private sector that serve as an example to the rest of the world that such a transformation is not just possible, it opens opportunity for national prosperity and protects the planet we all share.

I am confident that with reports such as the Climate & Energy Monitor and private sector leadership from progressive companies like Allianz, we can spark the transformation that spells success for the Paris Agreement. We can and must invest in a future where the engines of growth are powered by clean energy and resilience is our response to the risk we face.

**Christiana Figueres, Executive Secretary,
United Nations Framework Convention on Climate Change**



The G20 nations are at risk of falling short of the climate goals they set in Paris in December 2015. The main reason: a growing gap between current investments in renewable energy sources and future needs. The International Energy Agency (IEA) projects the need at USD 790 billion a year as early as 2020, and USD 2300 billion per year by 2035.

The Allianz Climate & Energy Monitor places the blame on inadequate climate strategies, together with their deficient implementation in the energy sector. If the G20 countries don't have a sufficiently comprehensive strategy for the energy transition, they won't just fall short of their climate goals. In the longer term, they'll also put their competitiveness at risk because they'll be so late in changing direction in the necessary technologies and infrastructures. Waiting will result in stranded investments and extra costs.

**Karsten Löffler, Managing Director,
Allianz Climate Solutions GmbH**



Germany and the UK are the only G20 states that have a concrete strategy for an emission-free energy sector so far, including converting their power grids. They offer the most attractive conditions for investors, followed by France and China. But even here, there's a threat of a massive shortfall in investment.

As a leading investor in renewable energy, Allianz is prepared to support the energy transition with even more investment. At present, Allianz's total investment in renewable energy comes to EUR 3 billion. Demand from private investors is substantially greater than supply. To adjust supply to the actual need for investments, it will be essential to rethink conventional assumptions. Almost every G20 state still places unnecessary restrictions on commitments by private investors, or fails to offer adequate legal safeguards. Yet the potential advantages to countries are not just financial. As experts in risk management, we are in a better position to help manage investment plans and project risks.

**Axel Zehren, CFO,
Allianz Investment Management SE**

Summary

1 G20 Energy Ministers Communiqué October 2nd 2015

2 The G20 member states are Argentina, Australia, Brazil, Canada, China, France, Germany, India, Indonesia, Italy, Japan, Republic of Korea, Mexico, Russia, Saudi Arabia, South Africa, Turkey, the United Kingdom and the United States of America. The EU, as a supranational body, was excluded from the assessment.

3 Excluding nuclear and large hydro technologies

The Allianz Climate and Energy Monitor ranks G20 member states on their attractiveness as potential destinations for investment in low-carbon electricity infrastructure. It takes into account their current and future investment needs in line with a 2° C global warming trajectory.

Consistency with the Paris Agreement, negotiated by 195 countries at the end of 2015, would require a full decarbonization of the global economy before the end of the century. This transformation will be particularly challenging for the energy sector – the largest source of carbon emissions. Every existing and new power plant risks being shut down before the end of its anticipated lifetime, unless it can operate on renewable energy or find a feasible and yet unknown means for the capture and storage of carbon.

Should this global climate agreement be implemented, investment patterns will need to shift rapidly to low-carbon electricity. It is estimated that energy production and use will have to be entirely emissions-free by 2055 or 2080, in order to reach the agreement's ambitious targets of 1.5°C or 2°C, respectively (Rogelj et al., 2015).

The G20 member states, representing the world's major economies, have an important leadership and market-development role to play in this transition. The first conference of G20 energy ministers in October 2015 emphasized the need for good policy practice in attracting private investment. Nevertheless, it lacked clear leadership commitment to the decarbonization of the energy sector.

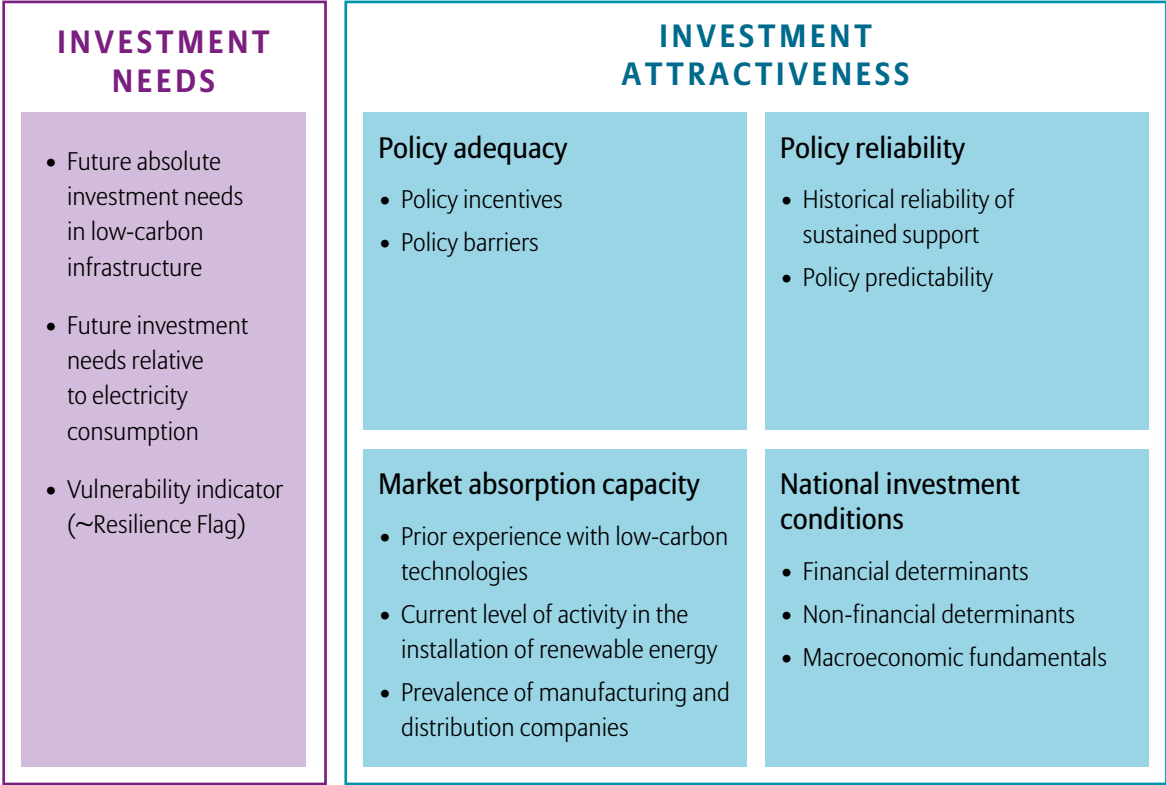
“Enhancing renewables investments through innovation, risk mitigation and the deployment of conducive policy frameworks, in accordance with national priorities and contexts, can contribute to an environmentally sound, socially and economically sustainable development path.” **G20 ENERGY MINISTERS COMMUNIQUE¹**

The International Energy Agency (IEA) estimates that the power sector will require additional investments of USD 790 billion per year by 2020, and thereafter approximately USD 2.3 trillion per year by 2035, to advance on a trajectory which may hold the global increase in average temperature to less than 2 degrees (IEA, 2014). This projection far exceeds the USD 286 billion invested into renewable energies globally in 2015 (FS-UNEP, 2016).

Investment on this level will require mobilizing substantial public and private sector investments. As renewable energy investments are fundamentally different from conventional power investments, private investors will require public guarantees and a stable investment environment before they can consider shifting funds.

The Allianz Climate and Energy Monitor indicates action areas for policy-making by ranking the G20 member states² on their relative attractiveness as investment destinations for building the necessary infrastructure for low-carbon electricity³. It shows how countries could improve their rating and offers insights into trends in investment needs and attractiveness, thereby identifying countries and regions that show promise for investors.

FIGURE 1: Graphic representation of the Allianz Climate and Energy Monitor



Further details on the composition of the pillars and the categories beneath them are given in section 1.2, while comprehensive information on the methodology as well as data and literature is available from the accompanying Technical Note, available at allianz.com/en/monitor.

Key results

G20 policies are insufficient for decarbonizing the power sector

- None of the G20 countries⁴ is currently taking sufficient action to combat the investment gap in the power sector, which would be necessary to be aligned to a 2°C limit in global average temperature increase.
- The countries vary widely in terms of their investment needs and attractiveness. For instance, while China will need to attract annual investments of USD 208bn to address its investment gap, Argentina’s shortfall is estimated at USD 5bn. And while countries such as Brazil or India are just beginning to introduce policies to promote transition to renewables, the UK and Germany already have a significant policy and installation track record.

Emerging countries face a huge investment gap while the OECD countries are leaders in policy framework

- Together, the G20 countries will require roughly USD 710 billion annually in absolute investment until 2035⁵.
- India, South Africa, Indonesia, China and Brazil will need to bridge 50% of this investment gap – having the highest investment needs – owing to their market size and development needs. This percentage increases when the overall vulnerability of their power infrastructures to the impact of climate change is taken into account.
- Most attractive in terms of investments are Germany, the United Kingdom and France due to good performance across all indicators. In the US, favorable general investment conditions and a large and ready market partially mask the generally low federal policy support.
- Notably, China has unsurprisingly high overall investment needs, but also the fourth-best investment attractiveness.
- Some of the countries with the highest investment needs – such as Brazil, India, Indonesia and South Africa – nevertheless have an insufficient investment framework and are therefore possibly unable to attract substantial private sector investment.
- In India, ambitious green policies are encumbered by generally unfavorable investment conditions. It will need a rapid translation of policy euphoria into hands-on, focused deployment in order to realize its full potential in this market.
- Being amongst the least attractive countries for investments, even countries with relatively low investment needs such as Mexico, Turkey and Argentina, still require substantial policy enhancement. These countries in particular need to level the playing field for investing in renewable energy as opposed to their massive fossil fuel sectors.

The G20 countries need to establish coherent strategies and policies to attract investments

- A coherent climate strategy is a vital element in giving investors confidence in the political commitment, but it also needs to translate into concrete and transparent policy measures that make investment in renewables attractive in comparison with fossil fuels. It also demands a favorable general macroeconomic investment climate.
- The G20 countries should further strengthen their leadership and market development role to attract investments, also by developing instruments to address specific investment risks. For example, they could allow development banks to mitigate political risks in order to increase the transparency and longevity of investments frameworks.

⁴ Assessment of G20 member states, excluding the EU as a supranational body.
⁵ Calculations based on a dataset from the International Energy Agency projected from 2014-2035.

FIGURE 2: Quadrant analysis of results from the monitor – illustration of the final scores relative to the other G20-countries



1 Introduction to the Monitor

1.1 Purpose and scope

6 Large hydro and nuclear were excluded to reflect concerns related to the sustainability of these technologies.

The Allianz Climate and Energy Monitor ranks the G20 member states on their relative attractiveness for investment in a low carbon-energy infrastructure, taking into account current and future investment needs in the sector in line with a 2° C global warming trajectory.

The Allianz Climate and Energy Monitor aims to support communication between the investment and the policy-making sectors. Using a composite index, the Monitor ranks both developed and developing G20 countries according to their potential in closing the financing gap in a low-carbon, climate-resilient energy infrastructure.

It identifies areas of improvement for facilitating investment in energy infrastructure in order to enable it to meet global temperature goals. It also indicates investment needs for building climate resilience. The Monitor’s findings can serve as a guideline for policymakers and other stakeholders regarding the investment needs and absorption capacity of individual countries.

The Monitor was compiled jointly by the NewClimate Institute and Germanwatch in order to focus on the electricity infrastructure in 19 of the G20 members (the EU, as a supranational body, was excluded). The investment attractiveness and needs of the countries examined are ranked as very low, low, medium, high or very high, with countries rated according to their performance in relation to one another. Ranking tools using composite indicators have a wide applicability, providing a better understanding of where countries stand in relation to one another on such multi-dimensional issues as performance monitoring, benchmarking and policy evaluation.

1.2 Methodology

The Monitor assesses the G20 countries’ renewable electricity production, excluding fossil fuels, large hydro and nuclear⁶ as well as transportation and storage infrastructure.

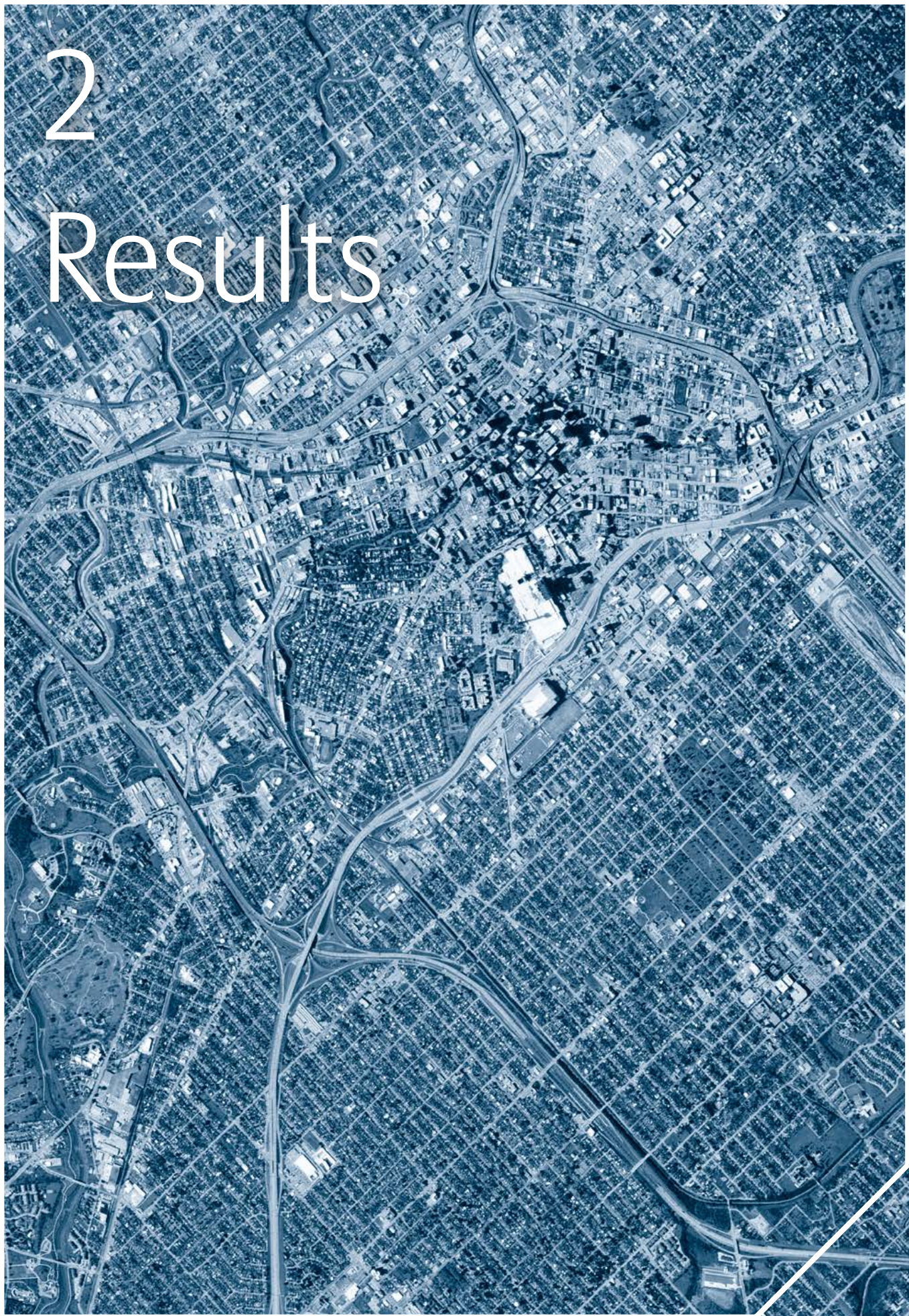
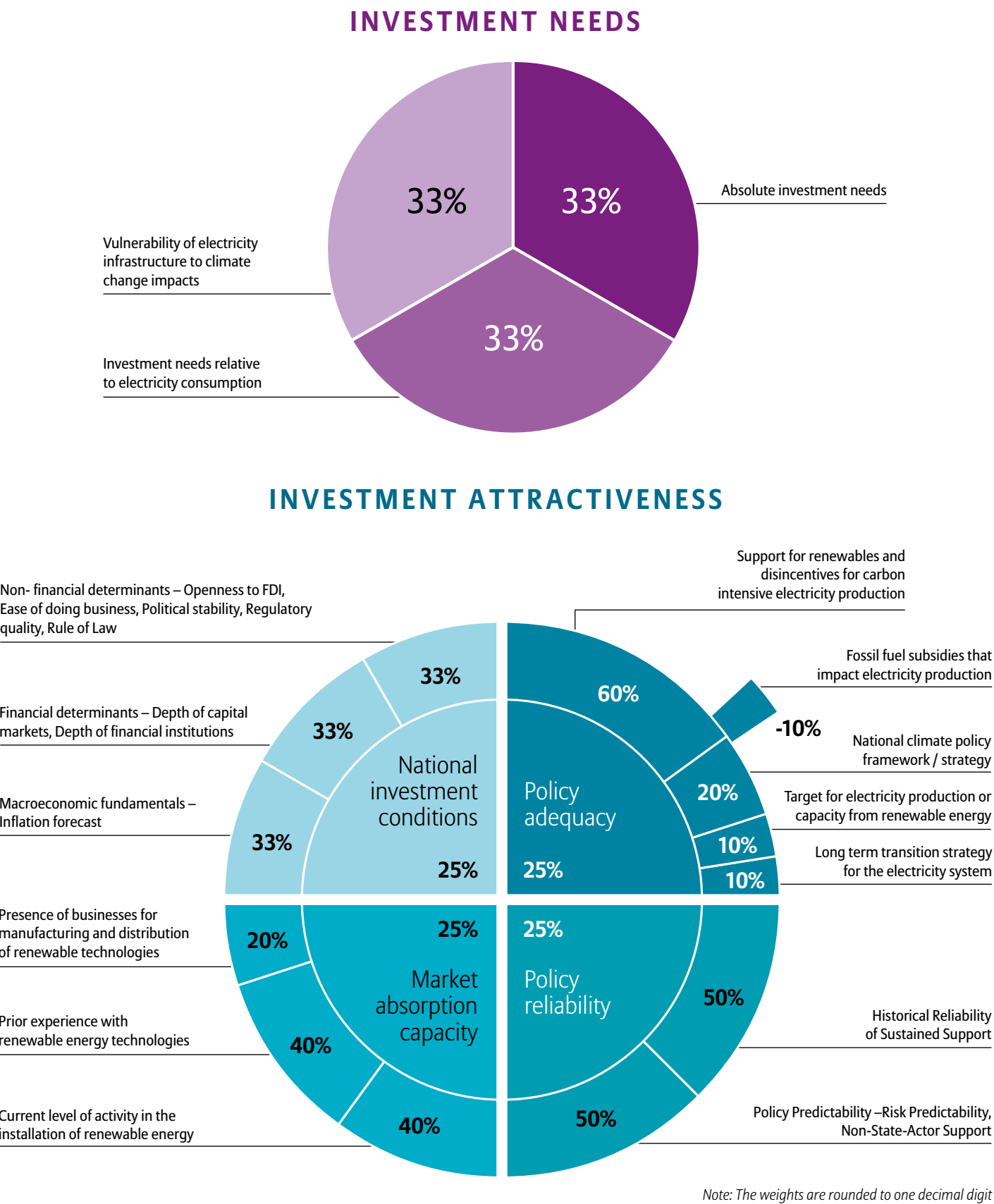
The analysis concentrates on two major pillars:

General investment need in the energy sector through to 2035, including absolute and relative investment requirements for the electricity infrastructure, and the vulnerability of the existing electricity infrastructure to the effects of climate change.

The attractiveness of various circumstances to potential investors for renewable energy, including policy adequacy and reliability, market absorption capacity and general national investment conditions.

Once calculated, the absolute scores were normalized for each indicator in a manner such that ratings lie between the best (100) and the worst (0) possible scores in the sample. Therefore, **any given country is scored in relation to the performance of its fellow G20 countries.**

FIGURE 3: Overview of the composition of the monitor



Overview

Table 1 presents the results from the two major pillars of the 2016 Allianz Climate and Energy Monitor. Countries are scored on a relative scale of 0 to 100 based on a compilation of scores from the multiple sub-categories and indicators that make up the Monitor, where a score of 100 for any given sub-level indicator equates to the best performing G20 country.

TABLE 1: Overview of results of the 2016 Allianz Climate and Energy Monitor

INVESTMENT NEEDS					INVESTMENT ATTRACTIVENESS				
Rank	Score		Country		Country	Score	Rank		
1	88		India		Germany	80	1		
2	73		South Africa		United Kingdom	74	2		
3	67		Indonesia		France	61	3		
4	64		China		China	59	4		
5	64		Brazil		Italy	57	5		
6	60		United States		South Korea	54	6		
7	47		Russia		Australia	52	7		
8	45		Japan		Japan	51	8		
9	43		Canada		United States	51	9		
10	43		Saudi Arabia		Canada	45	10		
11	43		South Korea		India	43	11		
12	41		France		South Africa	37	12		
13	39		United Kingdom		Brazil	35	13		
14	37		Germany		Mexico	31	14		
15	36		Argentina		Indonesia	30	15		
16	34		Turkey		Argentina	27	16		
17	32		Italy		Turkey	15	17		
18	25		Australia		Saudi Arabia	14	18		
19	25		Mexico		Russia	13	19		

Investment needs

- Absolute investment needs
- Investment needs relative to electricity consumption
- Vulnerability of electricity supply

Investment attractiveness

- Policy adequacy
- Policy reliability
- Market absorption capacity
- National investment conditions

FIGURE 4: Quadrant analysis of results from the monitor – illustration of the final scores relative to the other G20-countries



The results indicate that none of the G20 countries are currently taking sufficient appropriate action to combat the investment gap in the power sector, which would be necessary to be aligned to a 2°C limit in global average temperature increase. Even clear leaders such as Germany or the United Kingdom still show an investment gap and will need to sharpen their policy response in order to attract the private investment necessary to meeting this goal.

The spectrum of investment needs and attractiveness in the G20 countries is surprisingly broad. Despite the fact that almost all of the G20 countries have adopted at least some good-practice green policies, the respective scale of the policies and their commitment differs markedly. Not all of them follow an overarching climate strategy for renewable energy targets or support policies for renewables. Countries such as Saudi Arabia and Turkey even lack basic strategic developments in this sector.

The countries of the upper two quadrants have developed into interesting markets with good performance in most areas of investment attractiveness. In the US, however, favorable general investment conditions and a large, relatively mature market partially mask the country’s generally low federal policy support. This performance may soon lose its luster as other countries rush to create favorable conditions for investors and evolve into markets ripe for investment.

2.1 Future needs for investments in the electricity infrastructure

7 in USD/ GWh/ year

This element comparatively assesses the G20 member states regarding their future needs for investment in electricity infrastructure. The assessment reflects three facets of ‘investment needs’ using the following indicators:

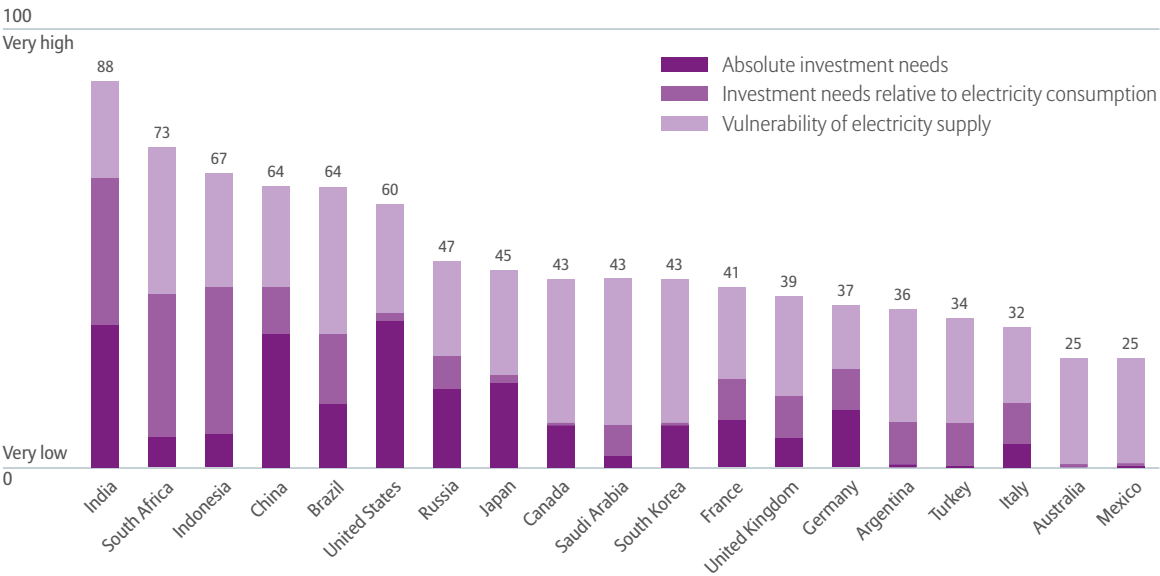
- 1. The absolute financial investment required of each country to reduce emissions in the energy sector in order to comply with the international goal to limit the long-term rise of global mean temperatures to 2 degrees Celsius (measured in billions of US dollars in 2012 values per year between 2014-2035).
- 2. The above absolute investment needs juxtaposed to the given country’s electricity consumption to assess its relative investment needs.⁷
- 3. Investment needs arising from the particular vulnerabilities of a given electricity infrastructure to climate change consequences, i.e. large reliance on hydroelectric, thermal and nuclear power increases sensitivity to drought and flood risks.

These results clearly indicate the higher relative and absolute needs of the emerging economies.

Together, G20 countries will require roughly USD₂₀₁₂ 710 billion per year in absolute investment between 2014-2035. The emerging countries India, South Africa, Indonesia, China and Brazil represent 50% of this investment gap due to their market size, development needs and the overall vulnerability of their energy infrastructure to climate change.

Of all the countries assessed, India emerges as the one in greatest need of investment in its energy sector, requiring approximately USD₂₀₁₂ 95 billion annually until 2035. Although China has the highest absolute investment needs (USD₂₀₁₂ 208 billion per year), it follows after India, South Africa and Indonesia in relative terms because its current electricity consumption is higher. Most OECD countries are situated to the right end of the graph, reflecting their better position in terms of investment needs in comparison with their non-OECD counterparts. In contrast, the US has a relatively high score owing to the substantial absolute investment that it will require in the foreseeable future (USD₂₀₁₂ 141 billion per year), as well as its vulnerable energy infrastructure, heavily reliant on thermal and nuclear power.

FIGURE 5: Overview of results for ‘investment needs’



2.2 Policy adequacy

‘Policy adequacy’ measures a country’s compliance with a package of good-practice policies that point the way to a substantial increase of renewables in proportion to other sources of energy generation. The Monitor examines four indicators of policy incentives, offset by one policy barrier indicator.

Policy incentives:

- National climate policy framework or strategy
- Targets for electricity production or capacity addition from renewable energy resources (excluding large hydro)
- Long-term transition strategies in place for the electricity system
- Support schemes for renewables or disincentives for carbon-intensive production

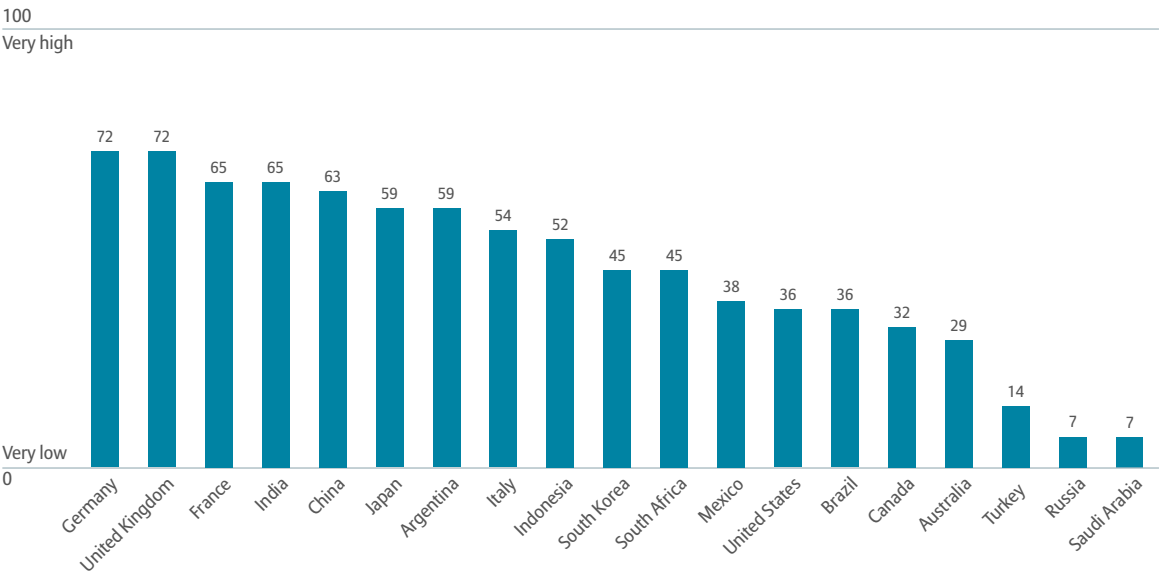
Policy barrier:

- Fossil fuel subsidies impacting the power generation sector, detracting from the overall score

As illustrated in Figure 6, none of the countries appear to have fully adequate climate and energy policies in place.

Germany and the United Kingdom are the best performers among the G20 countries, but both still indicate much room for improvement. Both of these EU members have clearly defined and legally enforced climate strategies – their energy targets translate into the equivalent of an annual minimum increase of 1.5 percentage points in the proportion of renewables in overall electricity production for the next 10 years. They are also the only two countries with recognizable transition strategies for the decarbonization of the electricity sector, including the development and adjustment of a grid infrastructure to integrate renewables. Their support schemes aim to put renewables on a favorable footing comparable to fossil fuels.

FIGURE 6: Overview of results for ‘policy adequacy’



Regarding other OECD countries, seven have initial strategies with limited comprehensiveness, while Australia and Turkey do not have any strategies at all. Most non-OECD countries have either initial plans (China, Brazil and Russia) or no strategies in place (Indonesia, South Africa, Saudi Arabia and Argentina).

India and China have the highest score among the emerging economies. Both countries perform on par with other OECD members on some elements of the good-practice policy package; however, they also lack a focused, long-term transition strategy and more stringent renewable energy targets.

Russia, Turkey and Saudi Arabia receive the lowest scores of all the G20 countries, as they have neither a climate change strategy nor concrete support schemes for renewables. Although Russia has expressed an interest in transitioning to a cleaner electricity generation system in its Energy Strategy 2030, it does not currently have a plan in place for the strategy’s implementation. Saudi Arabia has neither a long-term transition strategy nor substantial support schemes for renewables. Turkey’s lowest rating within the group of OECD countries reflects its inadequate policy support and lack of a transition strategy.

Most countries continue to support policies for fossil fuels. No G20 member was found to be completely free of direct or indirect subsidies for fossil fuel-fired electricity generation, although the scale of these subsidies differed widely between countries. Fossil fuels are currently subsidized through both direct subsidies to electricity production and various forms of upstream subsidies for the exploration and extraction of fossil fuels (mainly coal and natural gas).

Increased collaboration within the G20 can support members lagging behind in their investment attractiveness and current market activity in renewables

2.3 Reliability of sustained support

The table on the reliability of sustained support rates the consistency and predictability of national government agendas and policies for a low-carbon energy infrastructure. This category therefore assesses whether the countries assessed historically instituted a sufficient, coherent climate policy – especially within the electricity sector – and the likelihood of major shifts in their current policy framework.

The following indicators are used to assess the reliability of sustained support:

- The average level of support for low-carbon energy transition in the last seven years
- The degree of past fluctuation in the support for a low-carbon energy transition
- The political consensus concerning climate and energy policy
- The likelihood of major policy changes
- The strength of relevant lobby groups

A historically reliable green policy landscape and the future predictability of sustained policy support are critical factors in attracting investments in energy infrastructure. While some G20 countries have historically maintained continuous policy support for renewables, none of them can demonstrate a very high predictability for future support.

As illustrated in Figure 7, China and South Korea indicate the greatest reliability of support for a low-carbon energy transition. Both countries have shown greater than average support in the past. There are, however, difficulties in predicting future development for different reasons. China’s score is mainly constrained by its lack of transparency and its major information asymmetries. In South Korea, parties are very divided on the issue of climate and energy policy.

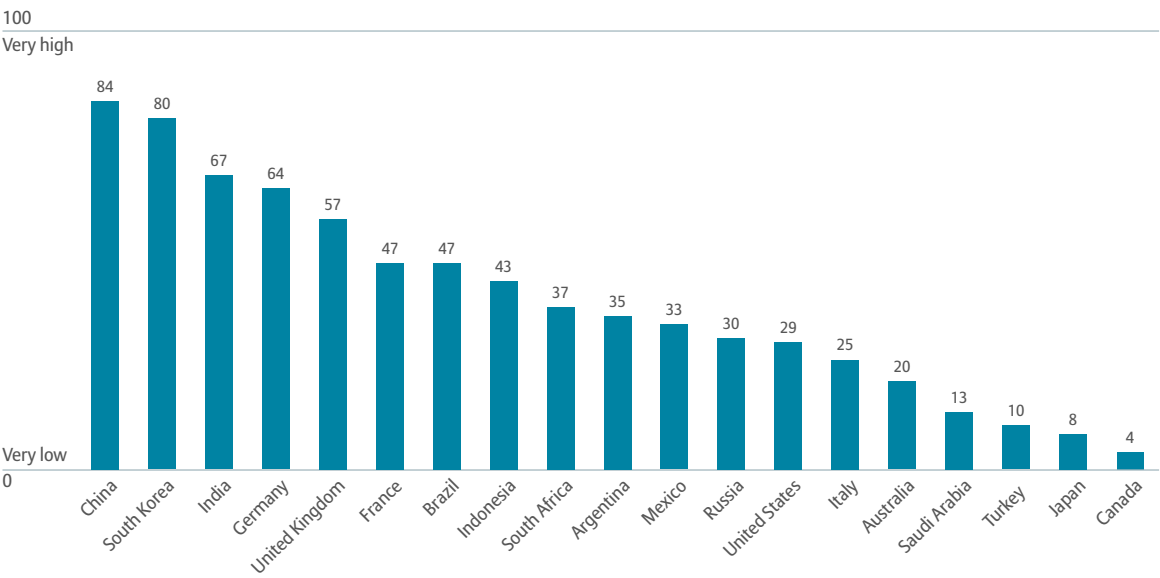
Among the G20 countries in the EU, Germany has the highest rating due to wide support from political as well as non-state actors, although its policy measures are not sufficiently coherent. After Germany, France and the UK are constrained by greater uncertainties regarding future support.

The United States scores well below average, demonstrating a lack of predictability. Political opponents in the US are very divided regarding the future of the country’s climate change policy, and policy-making varies between individual states.

Among the countries with the lowest performance, Saudi Arabia and Turkey show similar characteristics. Both countries lack sufficient support for a low-carbon transition, and predictability is limited in accordance with each country’s relatively poor governance variables.

Australia and Japan have shown ambivalent support for transition, displaying major differences in party positions and their societies concerning climate change policy. Canada proved to be reliable in terms of its level of support but seems prone to major shifts in policy with every change of government.

FIGURE 7: Overview of results for ‘reliability of sustained support’



2.4 Market absorption capacity

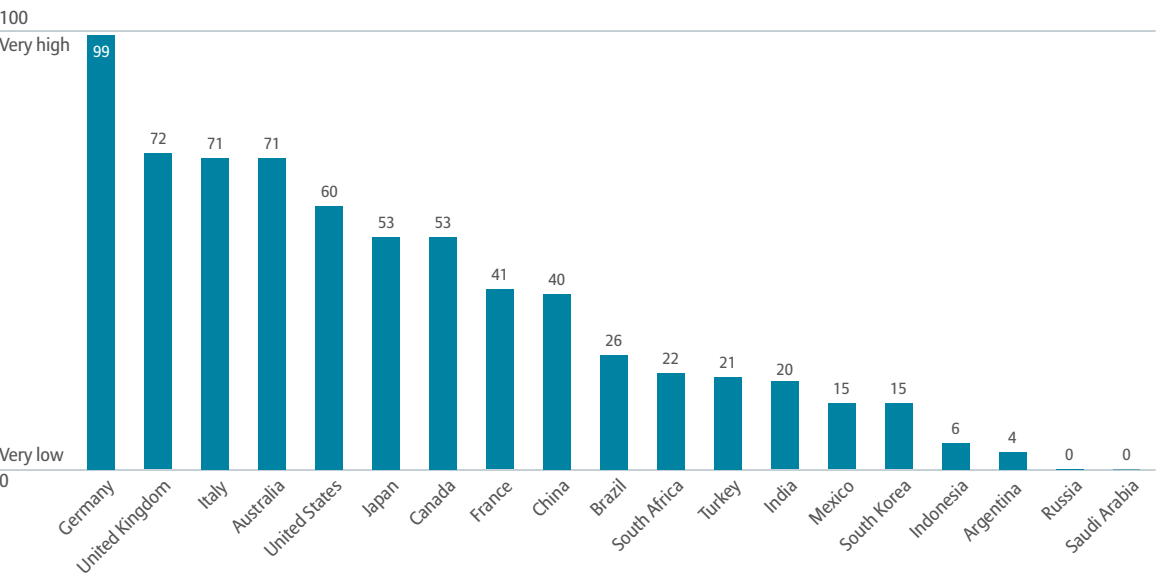
This category assesses the market’s maturity and capacity to implement a low-carbon energy infrastructure. Assessment was carried out by calculating a country’s prior experience with renewable technologies using the existing proportion of renewables in electricity generation and installed capacities, the current installation activity of renewables in recent years, and the presence of major renewable energy businesses in the country.

The results show a clear trend of higher performance among OECD countries. All of the top eight ranking countries are OECD members, with only Turkey, Mexico and South Korea outside of the top 10. Germany emerged as the top performer, reflecting its global standing as a world leader in renewables.

The major emerging economies are also attracting a good number of major renewable businesses to develop their share of these promising future markets. China leads this group, followed closely by Brazil, South Africa and India.

Although the ratings are relative, the countries with the lowest score for market absorption capacity also demonstrate very low activity in renewables on an absolute level. Saudi Arabia and Russia have both neglected to implement any significant installation of major renewable energy technologies (solar and wind), with major renewable energy businesses almost entirely lacking in these countries.

FIGURE 8: Overview of results for ‘market absorption capacity’



2.5 National investment conditions

This category rates countries on their general investment conditions, which influence an investor’s perception of risks and returns.

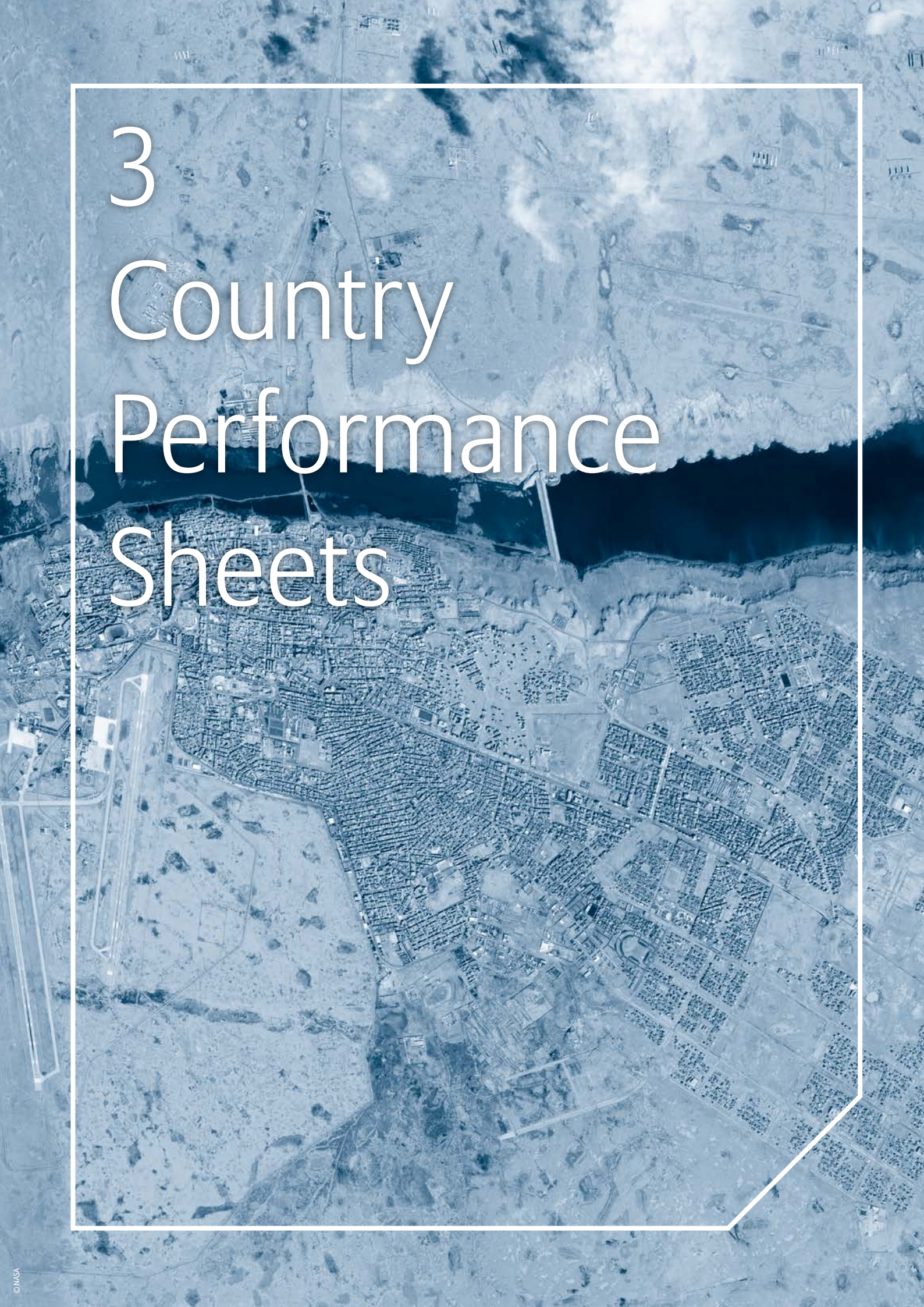
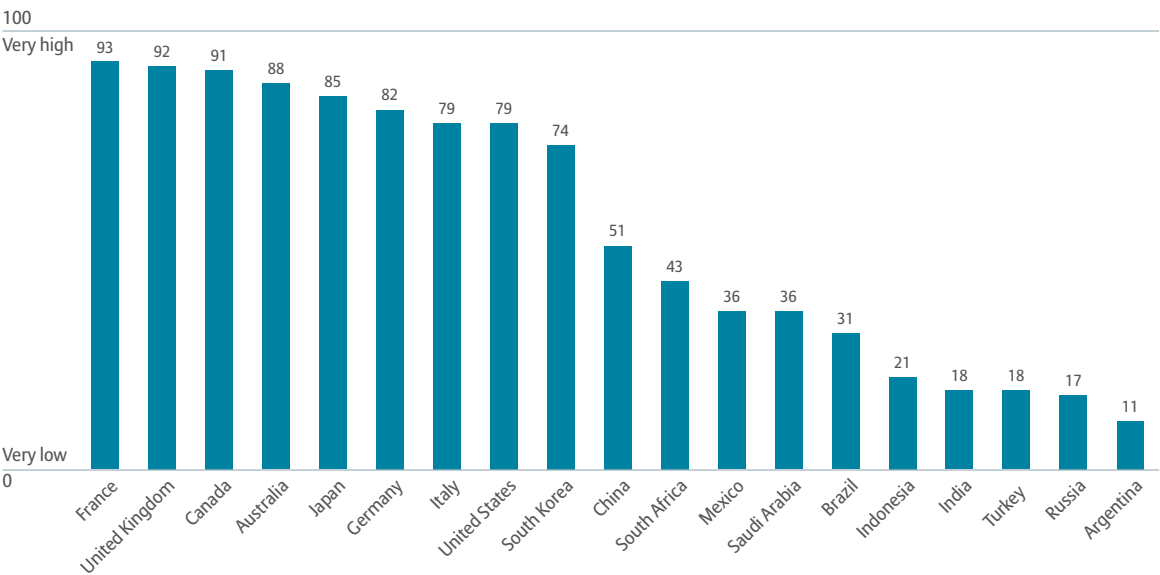
Countries are assessed according to financial and non-financial determinants:

- The depth of the private and public financial sector
- Inflation forecast
- Openness to foreign direct investment
- Regulatory practices and quality
- Political stability
- Rule of law

As with other categories, the scoring for national investment conditions shows a very clear division between OECD and non-OECD countries. OECD countries occupy the top nine positions, with less developed OECD members Mexico and Turkey falling outside of the top 10. A striking feature of the results presented in Figure 9 is that the scores for all of the top nine countries are very high and relatively similar. There is also a considerable gap in the ratings between them and the developing countries assessed. The general split in the results between developing and more developed countries is visible in all indicators. Only in the index for openness to foreign direct investment is there a lack of correlation to the countries’ development status.

The countries at the bottom end of the scale – India, Turkey, Russia and Argentina – all have extremely low scores for the financial depth of their economies, as well as for their in-country governance indicators. Their scores are furthermore negatively affected by very high rates of inflation. This cannot be sufficiently offset by their relatively high scores for openness to foreign direct investment in the electricity production sector.

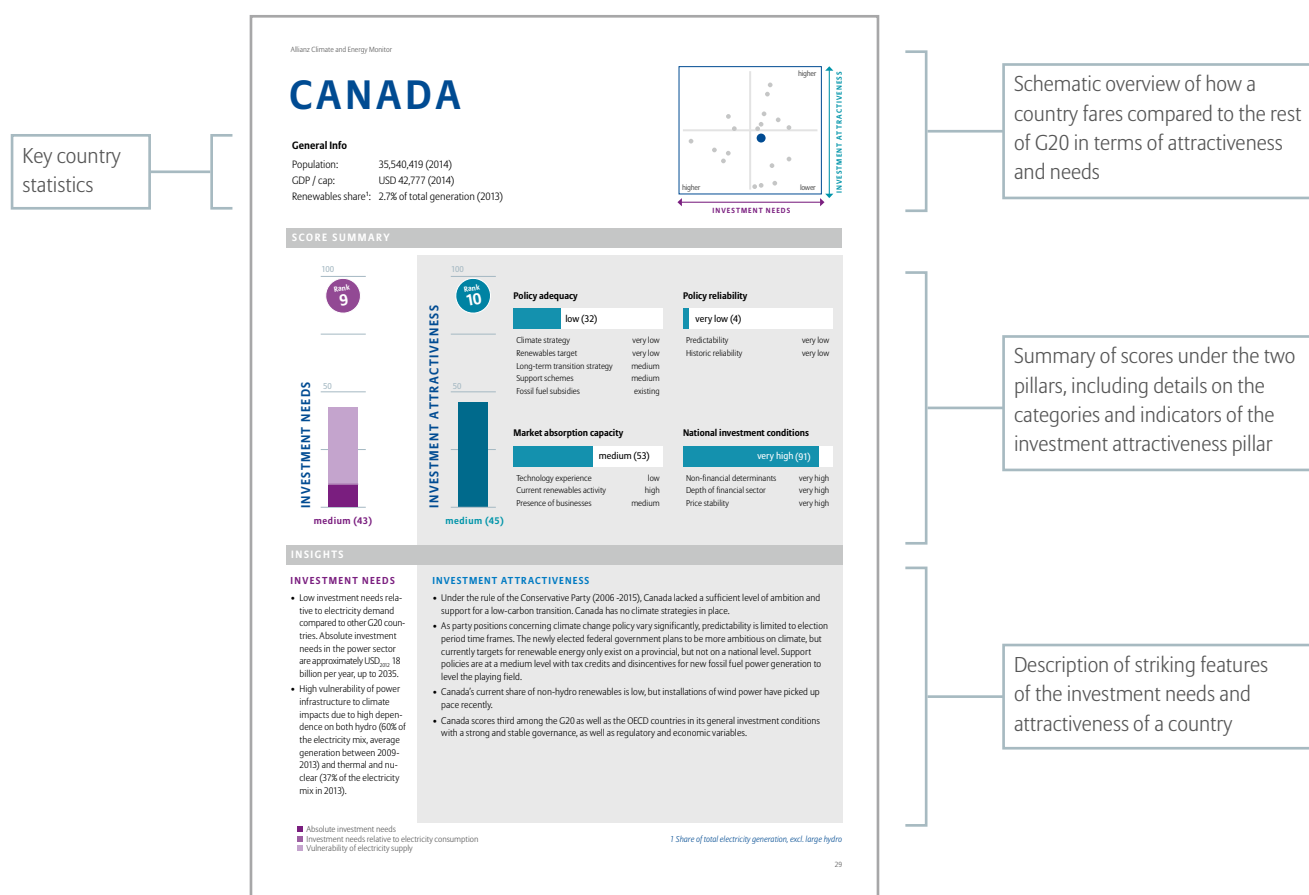
FIGURE 9: Overview of results for ‘national investment conditions’



The following pages present the results of the 2016 Allianz Climate and Energy Monitor for each of the G20 countries, excluding the European Union as a single entity.

Figure 10 presents a demonstrative overview of the country performance sheets, with guidance on how to interpret the information. As for all results of the Monitor, all scores in the performance sheets are relative to the scores of the other G20 countries analyzed, where 0 and 100 refer to lowest and highest scoring countries, rather than to absolute indications.

FIGURE 10: Interpretation of country performance sheets



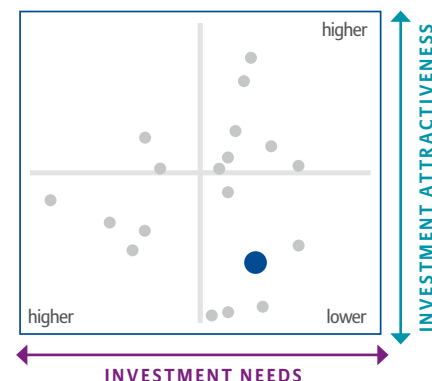
NOTE:

1. 'Policy adequacy' and 'Reliability of sustained support' categories evaluate 'green policies' of a country and not 'general policies'.
2. All countries have some form of direct or indirect fossil fuel subsidy in place. Hence they are all scored 'very low'.

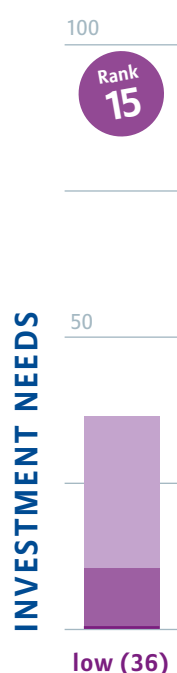
ARGENTINA

General Info

Population: 42,980,026 (2014)
 GDP / cap: USD 12,494 (2014)
 Renewables share¹: 2.1% of total generation (2013)



SCORE SUMMARY



Policy adequacy

medium (59)

Climate strategy	medium
Renewables target	very high
Long-term transition strategy	very low
Support schemes	high
Fossil fuel subsidies	existing

Policy reliability

low (35)

Predictability	high
Historic reliability	very low

Market absorption capacity

very low (4)

Technology experience	very low
Current renewables activity	very low
Presence of businesses	very low

National investment conditions

very low (11)

Non-financial determinants	low
Depth of financial sector	very low
Price stability	very low

INSIGHTS

INVESTMENT NEEDS

- Absolute investment needs in the power sector are approximately USD₂₀₁₂ 5 billion per year, up to 2035 and are relatively lower compared to other G20 countries.
- Vulnerability of power infrastructure to climate impacts due to high dependence on both hydro (25% of electricity mix, average generation between 2009-2013) and thermal and nuclear (75% of electricity mix, in 2013).

INVESTMENT ATTRACTIVENESS

- Argentina provides an ambitious renewable target and offers financial incentives through a feed-in-tariff and tax reliefs. However, a clearer overall strategy would further improve the investment climate.
- Experience with renewables is limited: the country has a small amount of biomass power capacity and limited activity in the installation of wind power, but negligible activity for solar.
- Argentina gets the lowest scores for 'national investment conditions' (worst-performing G20 country) due to a high inflation forecast, low financial depth and generally poor governance conditions compared to the other countries.

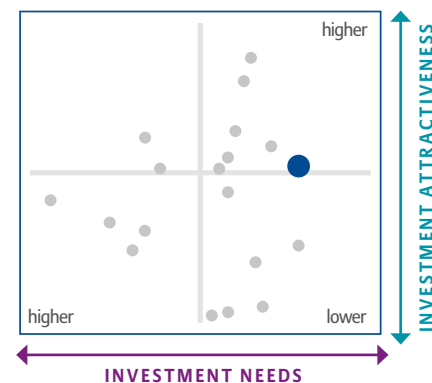
■ Absolute investment needs
 ■ Investment needs relative to electricity consumption
 ■ Vulnerability of electricity supply

¹ Share of total electricity generation, excl. large hydro

AUSTRALIA

General Info

Population: 23,490,736 (2014)
 GDP / cap: USD 43,218 (2014)
 Renewables share¹: 5.3% of total generation (2013)



SCORE SUMMARY



Policy adequacy

	low (29)
Climate strategy	medium
Renewables target	high
Long-term transition strategy	very low
Support schemes	low
Fossil fuel subsidies	existing

Policy reliability

	low (20)
Predictability	medium
Historic reliability	very low

Market absorption capacity

	high (71)
Technology experience	medium
Current renewables activity	very high
Presence of businesses	high

National investment conditions

	very high (88)
Non-financial determinants	very high
Depth of financial sector	very high
Price stability	high

INSIGHTS

INVESTMENT NEEDS

- Relatively low investment needs in the power sector, both in absolute terms and relative to electricity demand, compared to other G20 countries. Absolute investment needs are approximately USD₂₀₁₂ 7 billion per year, up to 2035.
- High vulnerability of power infrastructure to climate impacts due to high dependence on thermal and nuclear power (87% of the electricity mix, in 2013).

INVESTMENT ATTRACTIVENESS

- Australia has a relatively high renewables target but general climate policy, long-term strategy and support policies to reach the target are weak.
- Political support for a low-carbon transition has been fairly volatile in the past, displaying major differences in party positions concerning climate change policy.
- Australia had the second-largest rate of activity in new installation of renewables per capita across G20 countries between 2012 and 2014, attracting a high proportion of the world's leading renewable energy companies.
- Australia scores 2nd from top in its general investment conditions in the G20; owing to very high scores in its financial and non-financial determinants and relatively good long-term inflation forecast.

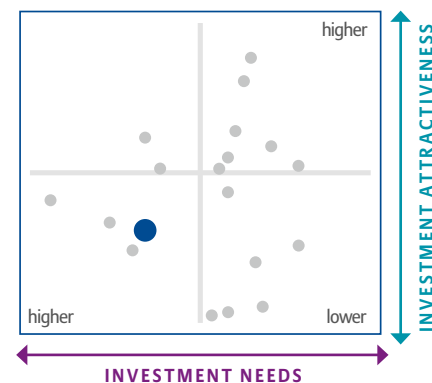
- Absolute investment needs
- Investment needs relative to electricity consumption
- Vulnerability of electricity supply

¹ Share of total electricity generation, excl. large hydro

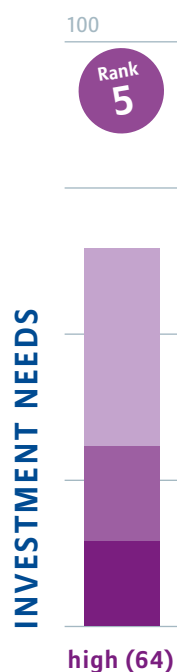
BRAZIL

General Info

Population: 206,077,898 (2014)
 GDP / cap: USD 15,109 (2014)
 Renewables share¹: 8.2% of total generation (2013)



SCORE SUMMARY



Policy adequacy

	low (36)
Climate strategy	high
Renewables target	medium
Long-term transition strategy	medium
Support schemes	low
Fossil fuel subsidies	existing

Policy reliability

	medium (47)
Predictability	high
Historic reliability	low

Market absorption capacity

	low (26)
Technology experience	low
Current renewables activity	very low
Presence of businesses	medium

National investment conditions

	low (31)
Non-financial determinants	medium
Depth of financial sector	low
Price stability	very low

INSIGHTS

INVESTMENT NEEDS

- Investment needs in the power sector, both in absolute and relative terms, are quite average compared to other G20 countries. Absolute investment needs are approximately USD₂₀₁₂ 25 billion per year, up to 2035.
- High vulnerability of power infrastructure to climate change impacts due to high dependence on hydro (77% of the electricity mix, average generation between 2009-2013).

INVESTMENT ATTRACTIVENESS

- While general climate ambition is high, Brazil only sets medium ambition renewable targets, provides limited support for renewables and fossil fuels still receive considerable subsidies.
- While there is relatively high consensus among all major parties on the decarbonization of the country's electricity sector, historical reliability has been low.
- Brazil's electricity generation is dominated by hydropower, but targets are in place to increase the role of wind and biomass, in particular. There are no significant solar installations despite the huge potential.
- In its general investment conditions, Brazil scores the sixth-lowest among all G20 countries and fourth-best among the non-OECD countries driven by the relatively lower scores on governance dimensions, shallow financial depth and a very low score for the high inflation forecast.

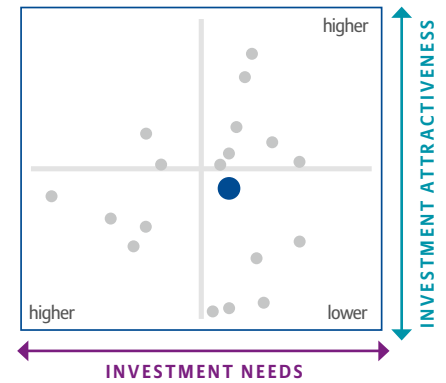
■ Absolute investment needs
 ■ Investment needs relative to electricity consumption
 ■ Vulnerability of electricity supply

¹ Share of total electricity generation, excl. large hydro

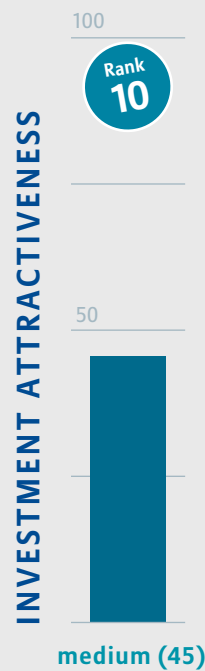
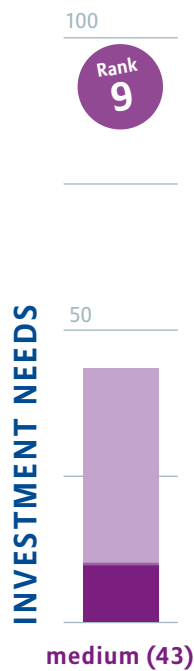
CANADA

General Info

Population: 35,540,419 (2014)
 GDP / cap: USD 42,777 (2014)
 Renewables share¹: 2.7% of total generation (2013)



SCORE SUMMARY



Policy adequacy

low (32)

Climate strategy	very low
Renewables target	very low
Long-term transition strategy	medium
Support schemes	medium
Fossil fuel subsidies	existing

Policy reliability

very low (4)

Predictability	very low
Historic reliability	very low

Market absorption capacity

medium (53)

Technology experience	low
Current renewables activity	high
Presence of businesses	medium

National investment conditions

very high (91)

Non-financial determinants	very high
Depth of financial sector	very high
Price stability	very high

INSIGHTS

INVESTMENT NEEDS

- Low investment needs relative to electricity demand compared to other G20 countries. Absolute investment needs in the power sector are approximately USD₂₀₁₂ 18 billion per year, up to 2035.
- High vulnerability of power infrastructure to climate impacts due to high dependence on both hydro (60% of the electricity mix, average generation between 2009-2013) and thermal and nuclear (37% of the electricity mix in 2013).

INVESTMENT ATTRACTIVENESS

- Under the rule of the Conservative Party (2006 -2015), Canada lacked a sufficient level of ambition and support for a low-carbon transition. Canada has no climate strategies in place.
- As party positions concerning climate change policy vary significantly, predictability is limited to election period time frames. The newly elected federal government plans to be more ambitious on climate, but currently targets for renewable energy only exist on a provincial, but not on a national level. Support policies are at a medium level with tax credits and disincentives for new fossil fuel power generation to level the playing field.
- Canada's current share of non-hydro renewables is low, but installations of wind power have picked up pace recently.
- Canada scores third among the G20 as well as the OECD countries in its general investment conditions with a strong and stable governance, as well as regulatory and economic variables.

■ Absolute investment needs
 ■ Investment needs relative to electricity consumption
 ■ Vulnerability of electricity supply

¹ Share of total electricity generation, excl. large hydro

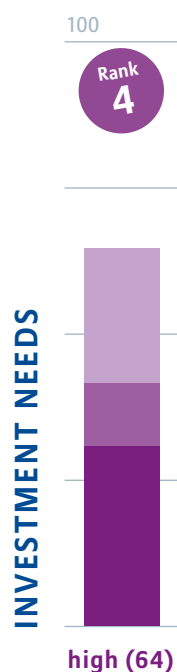
CHINA

General Info

Population: 1,364,270,000 (2014)
 GDP / cap: USD 12,599 (2014)
 Renewables share¹: 3.6% of total generation (2013)



SCORE SUMMARY



Policy adequacy

high (63)

Climate strategy	high
Renewables target	medium
Long-term transition strategy	medium
Support schemes	high
Fossil fuel subsidies	existing

Policy reliability

very high (84)

Predictability	high
Historic reliability	very high

Market absorption capacity

medium (40)

Technology experience	low
Current renewables activity	low
Presence of businesses	very high

National investment conditions

medium (51)

Non-financial determinants	low
Depth of financial sector	medium
Price stability	high

INSIGHTS

INVESTMENT NEEDS

- Highest absolute investment needs in the power sector from all G20 countries: approximately USD₂₀₁₂ 208 billion per year, up to 2035.
- High vulnerability of power infrastructure to climate change impacts due to high dependence on thermal and nuclear power (79% of the electricity mix, in 2013).

INVESTMENT ATTRACTIVENESS

- China's general climate strategy is comprehensive. The ambition of the renewable target is medium. Renewables are supported through various support schemes, e.g. tax reliefs, feed in tariffs or subsidies.
- China provided coherent policy support above average levels in the past. However, policy predictability is somewhat limited due to the country's lack of transparency and major information asymmetries.
- China has the best representation of the world's major renewable energy companies and high installation volumes, although this remains relatively low on a per capita basis.
- While scoring best among the non-OECD economies, China still fares below most developed economies on the financial, non-financial and macroeconomic variables influencing its overall general investing conditions and hence the investment attractiveness.

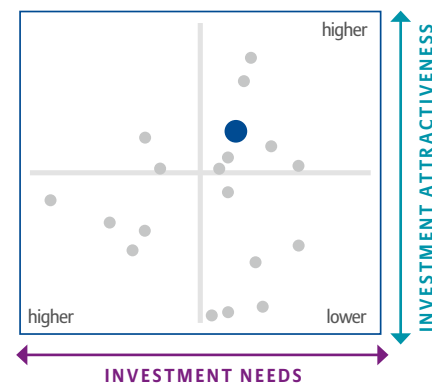
■ Absolute investment needs
 ■ Investment needs relative to electricity consumption
 ■ Vulnerability of electricity supply

¹ Share of total electricity generation, excl. large hydro

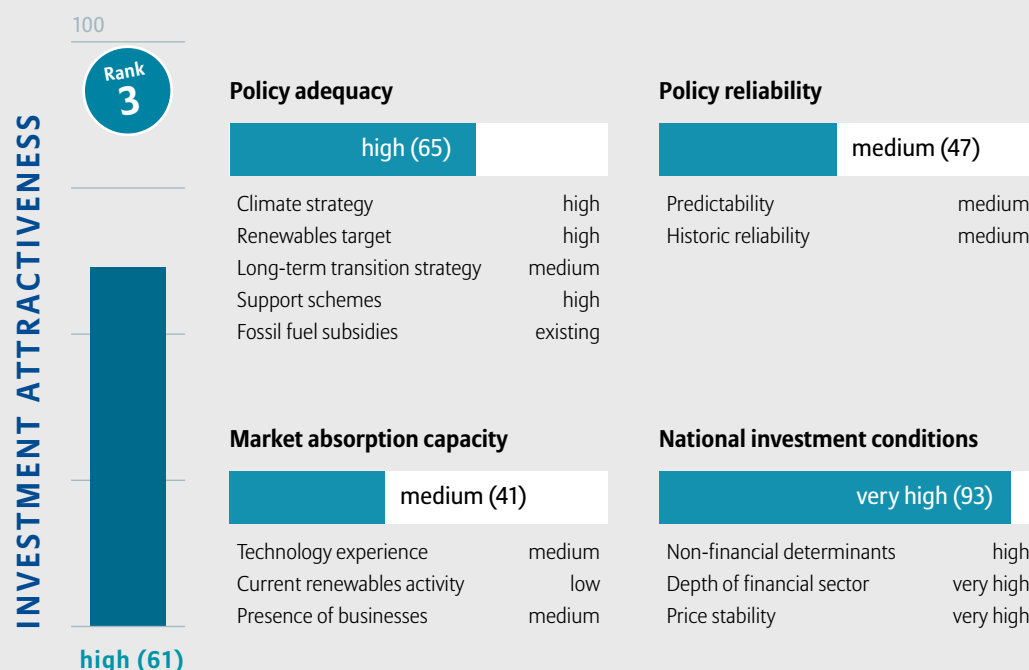
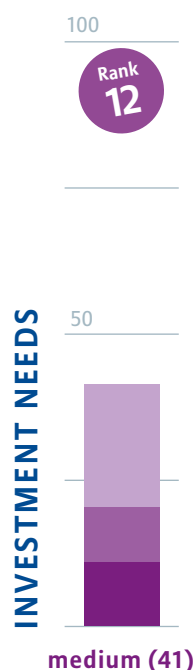
FRANCE

General Info

Population: 66,206,930 (2014)
 GDP / cap: USD 37,214 (2014)
 Renewables share¹: 4.6% of total generation (2013)



SCORE SUMMARY



INSIGHTS

INVESTMENT NEEDS

- Investment needs in the power sector, both in absolute and relative terms, are slightly below average compared to other G20 countries. Absolute investment needs are approximately USD₂₀₁₂ 19 billion per year, up to 2035.
- High vulnerability of power infrastructure to climate change impacts due to high dependence on thermal and nuclear power (82% of the electricity mix, in 2013).

INVESTMENT ATTRACTIVENESS

- France provides a regularly updated climate strategy. France has numerous policies in support of renewables, e.g. feed-in-tariffs / market premiums.
- Progress has been steady but slow in the past. Political parties and the public remain hesitant in their support of a low-carbon energy transition that is not based on nuclear power.
- France has moderately low levels of installation activity with solar and wind, and the lowest historical and present activity amongst EU G20 countries.
- France performs best in the general investment conditions among the G20 countries, owing to strong domestic economic and governance conditions relative to the rest.

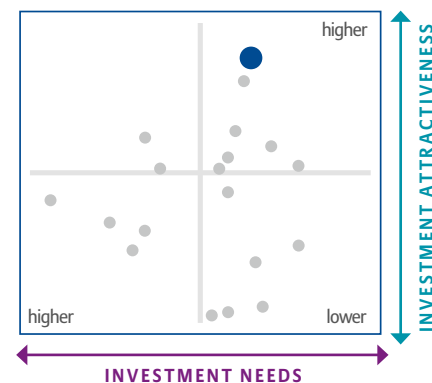
■ Absolute investment needs
 ■ Investment needs relative to electricity consumption
 ■ Vulnerability of electricity supply

¹ Share of total electricity generation, excl. large hydro

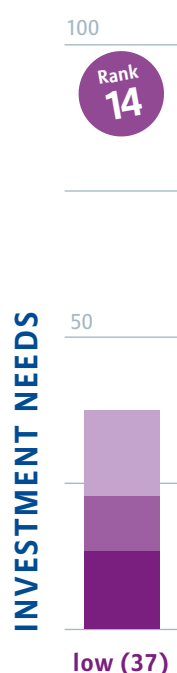
GERMANY

General Info

Population: 80,889,505 (2014)
 GDP / cap: USD 43,602 (2014)
 Renewables share¹: 20.1% of total generation (2013)



SCORE SUMMARY



Policy adequacy

high (72)

Climate strategy	high
Renewables target	very high
Long-term transition strategy	very high
Support schemes	high
Fossil fuel subsidies	existing

Policy reliability

high (64)

Predictability	high
Historic reliability	medium

Market absorption capacity

very high (99)

Technology experience	very high
Current renewables activity	very high
Presence of businesses	very high

National investment conditions

very high (82)

Non-financial determinants	very high
Depth of financial sector	high
Price stability	very high

INSIGHTS

INVESTMENT NEEDS

- Investment needs, both in absolute and relative terms, are slightly below average compared to other G20 countries. Absolute investment needs are approximately USD₂₀₁₂ 23 billion per year, up to 2035.
- High vulnerability of power infrastructure to climate change impacts due to significant dependence on thermal and nuclear power (74% of electricity mix, in 2013) and hydro (4% of average generation between 2009- 2013).

INVESTMENT ATTRACTIVENESS

- Germany has a stable long-term strategy for the energy transition and provides significant support to renewables in the electricity sector through market premiums. Recent and planned changes to the renewables law created uncertainty for investors. Nevertheless, Germany scores best of all G20 countries in terms of the investment framework.
- Political as well as non-state-actors apprehend the importance of a low-carbon future. However, in terms of climate policy measures – support hasn't been accordingly coherent in the past, resulting in an increase of energy sector emissions.
- Germany is the global leader in terms of the renewables' share in the power mix as well as for current installation activity per capita, attracting a very high proportion of the world's major renewable energy companies.
- Germany scores relatively highly in all fundamental elements of general investing conditions.

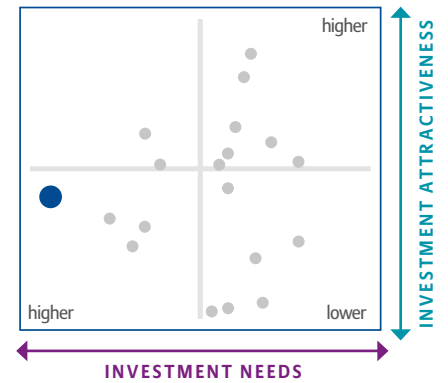
■ Absolute investment needs
 ■ Investment needs relative to electricity consumption
 ■ Vulnerability of electricity supply

¹ Share of total electricity generation, excl. large hydro

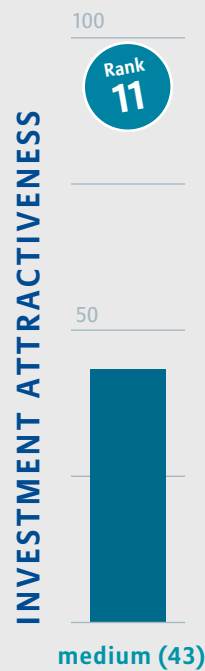
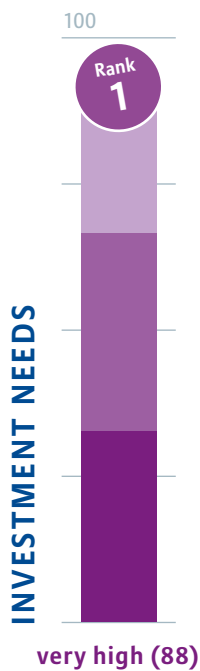
INDIA

General Info

Population: 1,295,291,543 (2014)
 GDP / cap: USD 5,438 (2014)
 Renewables share¹: 5% of total generation (2013)



SCORE SUMMARY



Policy adequacy

high (65)

Climate strategy	high
Renewables target	high
Long-term transition strategy	medium
Support schemes	high
Fossil fuel subsidies	existing

Policy reliability

high (67)

Predictability	low
Historic reliability	very high

Market absorption capacity

low (20)

Technology experience	very low
Current renewables activity	very low
Presence of businesses	medium

National investment conditions

very low (18)

Non-financial determinants	low
Depth of financial sector	very low
Price stability	very low

INSIGHTS

INVESTMENT NEEDS

- Highest investment needs relative to electricity demand of all G20 countries. Absolute investment needs are approximately USD₂₀₁₂ 95 billion per year, up to 2035. Different to the other G20 countries, India still has a significant share of its population without electricity access (21%), creating additional investment needs.
- High vulnerability of power infrastructure to climate change impacts due to high dependence on thermal and nuclear power (83% of electricity mix in 2013).

INVESTMENT ATTRACTIVENESS

- India follows a comprehensive national plan and describes measures and mechanisms to implement its fairly ambitious renewable energy targets, in particular for solar power. Renewable sources as well as fossil fuels are subsidized.
- India provided coherent support for a low-carbon energy infrastructure above average levels in the past. However, fossil fuel lobby-groups dominate the public debate and influence policy-making.
- Current activity in renewable installation is very low on a per capita basis, but fair in terms of absolute volume. This, along with regional pioneering and a high perceived renewables potential, attracts a relatively large proportion of the major renewable energy companies.
- India's poor performance in the governance and economic dimensions pulls it down to the 16th rank in the G20 as well as behind other emerging economies in general investing conditions.

- Absolute investment needs
- Investment needs relative to electricity consumption
- Vulnerability of electricity supply

¹ Share of total electricity generation, excl. large hydro

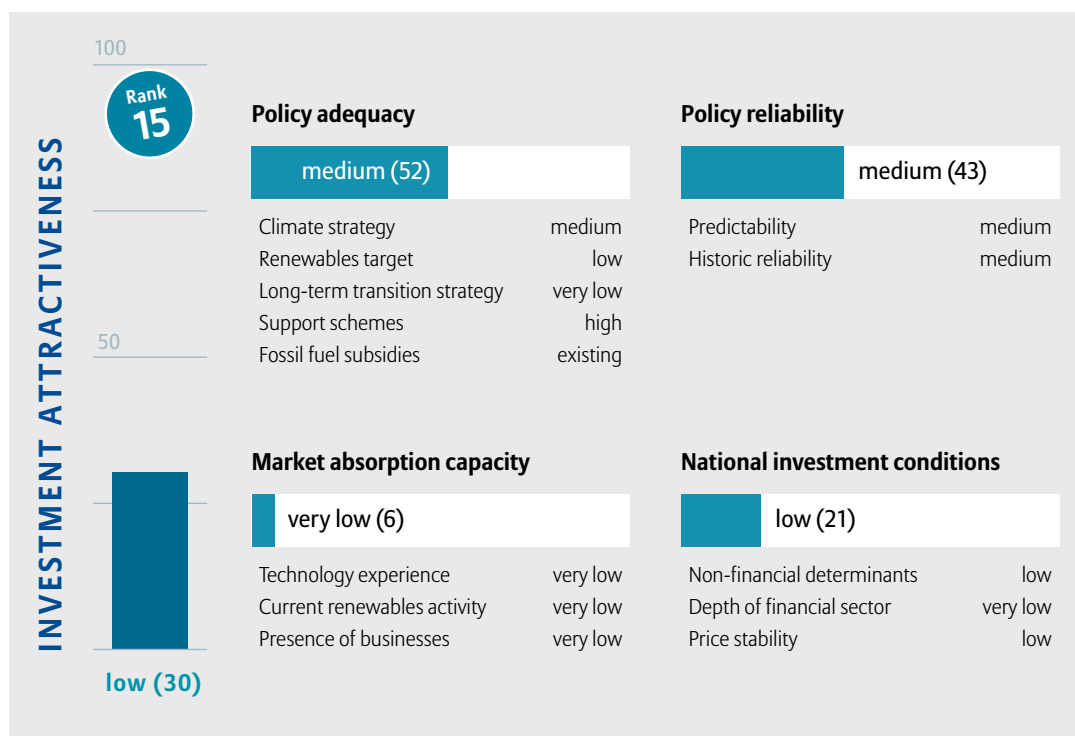
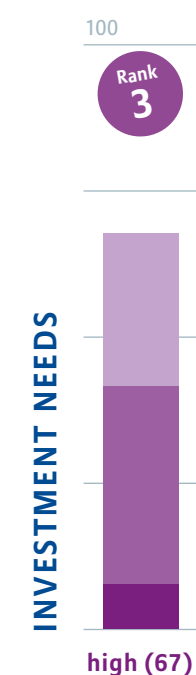
INDONESIA

General Info

Population: 254,454,778 (2014)
 GDP / cap: USD 10,033 (2014)
 Renewables share¹: 4.5% of total generation (2013)



SCORE SUMMARY



INSIGHTS

INVESTMENT NEEDS

- Very high investment needs relative to electricity demand. Absolute investment needs are approximately USD₂₀₁₂ 15 billion per year, up to 2035.
- High vulnerability of power infrastructure to climate change impacts due to high dependence on thermal and nuclear energy (88% of electricity mix in 2013).

INVESTMENT ATTRACTIVENESS

- Indonesia has a national climate target and a renewables target of relative low ambition. The support for renewables in electricity supply is substantial. Fossil fuels subsidies exist but Indonesia has undertaken significant efforts in the last years to scale them down.
- Political parties have been hesitant in endorsing low-carbon energy carriers, while implications of a change of government are difficult to capture – in part due to relatively poor governance variables which in turn limit predictability.
- Indonesia has a relatively large installed capacity of geothermal power, but negligible amounts of historic or current activity with wind and solar.
- Indonesia scores fifth-worst in general investing conditions.

■ Absolute investment needs
 ■ Investment needs relative to electricity consumption
 ■ Vulnerability of electricity supply

¹ Share of total electricity generation, excl. large hydro

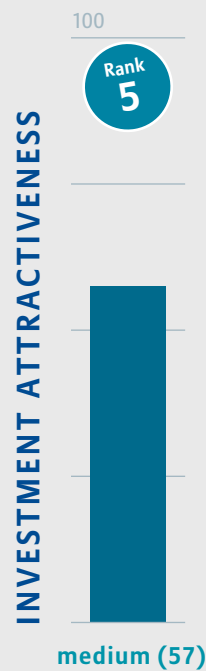
ITALY

General Info

Population: 61,336,387 (2014)
 GDP / cap: USD 33,038 (2014)
 Renewables share¹: 20.6% of total generation (2013)



SCORE SUMMARY



Policy adequacy

medium (54)

Climate strategy	medium
Renewables target	very low
Long-term transition strategy	medium
Support schemes	high
Fossil fuel subsidies	existing

Policy reliability

low (25)

Predictability	medium
Historic reliability	very low

Market absorption capacity

high (71)

Technology experience	very high
Current renewables activity	medium
Presence of businesses	high

National investment conditions

high (79)

Non-financial determinants	high
Depth of financial sector	high
Price stability	very high

INSIGHTS

INVESTMENT NEEDS

- Relatively low absolute investment needs, compared to other G20 countries. Absolute investment needs are approximately USD₂₀₁₂ 13 billion per year, up to 2035.
- Vulnerability of power infrastructure to climate change impacts due to medium dependence on both hydro (8% of electricity mix, average generation between 2009-2013) as well as thermal and nuclear power (60% in 2013).

INVESTMENT ATTRACTIVENESS

- While Italy provides significant support for renewables, its current target for renewables is already reached with no update yet. Furthermore, the subsidies for electricity generation from fossil fuels are significant.
- Political support for a low-carbon transition has been ambivalent in the past, displaying major differences in party positions regarding climate change and energy policy. Non-state-actors are quite active but lack political echo.
- Italy has the second-largest share of renewables for electricity generation, with a very high amount of solar in particular. However, current activity for new installations is relatively low.
- Italy scores seventh in its general investment conditions, owing to high scores in the financial and nonfinancial variables as well as a good long-term inflation forecast compared to other G20 members.

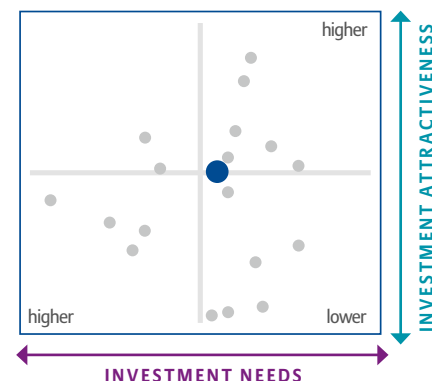
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¹ Share of total electricity generation, excl. large hydro

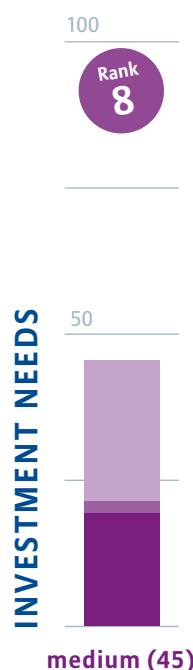
JAPAN

General Info

Population: 127,131,800 (2014)
 GDP / cap: USD 35,634 (2014)
 Renewables share¹: 5.5% of total generation (2013)



SCORE SUMMARY



Policy adequacy

medium (59)

Climate strategy	medium
Renewables target	medium
Long-term transition strategy	medium
Support schemes	high
Fossil fuel subsidies	existing

Policy reliability

very low (8)

Predictability	very low
Historic reliability	very low

Market absorption capacity

medium (53)

Technology experience	medium
Current renewables activity	medium
Presence of businesses	high

National investment conditions

very high (85)

Non-financial determinants	very high
Depth of financial sector	high
Price stability	very high

INSIGHTS

INVESTMENT NEEDS

- Absolute investment needs are high, although considerably lower when compared to electricity demand. Absolute investment needs are approximately USD₂₀₁₂ 36 billion per year, up to 2035.
- High vulnerability of power infrastructure to climate change impacts due to high dependence on thermal or nuclear energy (86% of the electricity mix in 2013).

INVESTMENT ATTRACTIVENESS

- Japan's Plan for Global Warming Countermeasures is currently under development. The already agreed targets are not ambitious, a legally binding plan beyond 2020 does not exist. Nevertheless, Japan provides significant support for renewables with grants, subsidies and tax deductions. In addition, Japan provides a subsidy for replacing old coal power plants with new natural gas power plants.
- Japan showed volatile support for a low-carbon energy transition. Political parties as well as non-state-actors display major differences concerning the country's future climate and energy policy.
- Japan attracts a high proportion of the world's leading renewable energy companies due to the strength of technological and exporting industries in the country and the very high level of solar power installations. Wind power installations remain very low.
- Scoring 5th, Japan's good performance in 'National Investing Conditions' is attributed to very high scores in the non-financial and macroeconomic determinants and high scores in the financial determinants relative to other G20 members.

- Absolute investment needs
- Investment needs relative to electricity consumption
- Vulnerability of electricity supply

¹ Share of total electricity generation, excl. large hydro

MEXICO

General Info

Population: 125,385,833 (2014)
 GDP / cap: USD 16,284 (2014)
 Renewables share¹: 3.9% of total generation (2013)



SCORE SUMMARY



Policy adequacy

	low (38)
Climate strategy	high
Renewables target	high
Long-term transition strategy	medium
Support schemes	low
Fossil fuel subsidies	existing

Policy reliability

	low (33)
Predictability	medium
Historic reliability	low

Market absorption capacity

	very low (15)
Technology experience	very low
Current renewables activity	very low
Presence of businesses	low

National investment conditions

	low (36)
Non-financial determinants	medium
Depth of financial sector	very low
Price stability	high

INSIGHTS

INVESTMENT NEEDS

- Relatively low investment needs compared to other G20 countries, both in absolute terms and relative to electricity demand. Absolute investment needs are approximately USD₂₀₁₂ 9 billion per year, up to 2035.
- High vulnerability due to high dependence on thermal and nuclear energy (87% of electricity mix in 2013).

INVESTMENT ATTRACTIVENESS

- Mexico pursues a comprehensive climate strategy with clear objectives, which includes an ambitious renewables target. However, these targets are not supported with support mechanisms for renewables.
- Parties have been vocal on the importance of a low-carbon energy transition but failed to implement adequate policy measures – in part due to a strong fossil-fuel lobby. Predictability is furthermore limited due to the country's relatively poor governance variables.
- Mexico has experience with biomass and geothermal power. The role of wind power remains limited but is increasing, whilst activity for solar remains very low, despite significant potential.
- Mexico scores poorly in the depth of domestic markets and financial institutions, leading to an overall medium score for its general investing conditions; ending up as second-lowest in OECD and 12th overall.
- Mexico has long been closed to private domestic and foreign investments in the energy sector. However, the constitutional reforms of 2014 aim at opening up this sector, including electricity generation, to private investors.

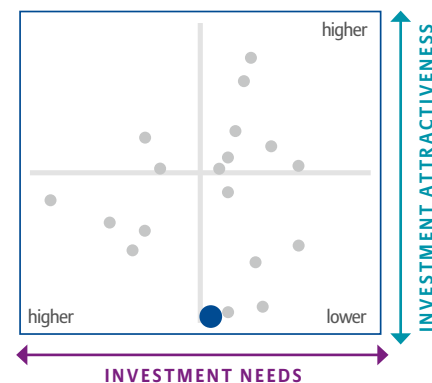
■ Absolute investment needs
 ■ Investment needs relative to electricity consumption
 ■ Vulnerability of electricity supply

¹ Share of total electricity generation, excl. large hydro

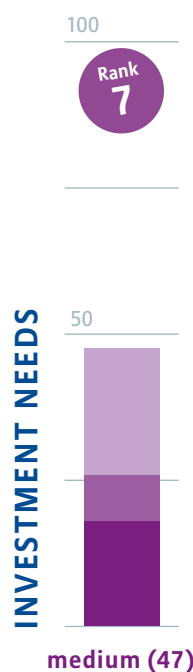
RUSSIA

General Info

Population: 143,819,569 (2014)
 GDP / cap: USD 23,660 (2014)
 Renewables share¹: 0.1% of total generation (2013)



SCORE SUMMARY



Policy adequacy

very low (7)

Climate strategy	very low
Renewables target	low
Long-term transition strategy	medium
Support schemes	very low
Fossil fuel subsidies	existing

Policy reliability

low (30)

Predictability	low
Historic reliability	low

Market absorption capacity

very low (0)

Technology experience	very low
Current renewables activity	very low
Presence of businesses	very low

National investment conditions

very low (17)

Non-financial determinants	low
Depth of financial sector	very low
Price stability	very low

INSIGHTS

INVESTMENT NEEDS

- Relatively high absolute investment needs. Absolute investment needs are approximately USD₂₀₁₂ 32 billion per year, up to 2035.
- Vulnerability of power infrastructure to climate change impacts due to high dependence on thermal and nuclear energy (82% of electricity mix in 2013).

INVESTMENT ATTRACTIVENESS

- Russia has defined low-ambition targets, e.g. a proposed 2.5% share of electricity generation from renewables (excluding large hydro) by 2020, the lowest share among all G20 countries. A decree without specified support measures is Russia's only relevant form of support for renewables.
- Predictability of future climate policy developments is significantly limited due to the country's relatively poor governance variables.
- Russia has no significant activity with renewables and hosts a negligible presence of the world's major renewable energy businesses.
- A poor inflation forecast and the lack of economic depth of markets and financial institutions as well as a low performance in the governance indicators and FDI make Russia score second-lowest among the G20 in its general investment conditions.

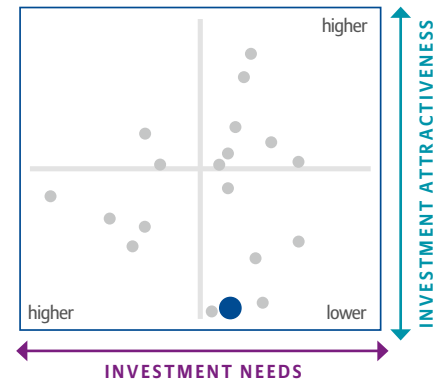
■ Absolute investment needs
 ■ Investment needs relative to electricity consumption
 ■ Vulnerability of electricity supply

¹ Share of total electricity generation, excl. large hydro

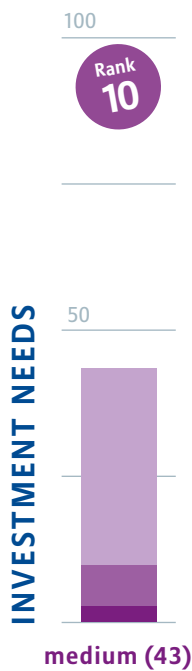
SAUDI ARABIA

General Info

Population: 30,886,545 (2014)
 GDP / cap: USD 49,536 (2014)
 Renewables share¹: 0% of total generation (2013)



SCORE SUMMARY



Policy adequacy

very low (7)

Climate strategy	very low
Renewables target	high
Long-term transition strategy	very low
Support schemes	very low
Fossil fuel subsidies	existing

Policy reliability

very low (13)

Predictability	low
Historic reliability	very low

Market absorption capacity

very low (0)

Technology experience	very low
Current renewables activity	very low
Presence of businesses	very low

National investment conditions

low (36)

Non-financial determinants	medium
Depth of financial sector	very low
Price stability	high

INSIGHTS

INVESTMENT NEEDS

- Relatively low absolute investment needs, compared to other G20 countries. Absolute investment needs are approximately USD₂₀₁₂ 10 billion per year, up to 2035.
- High vulnerability of power infrastructure to climate change impacts due to complete dependence on thermal and nuclear energy (100% of electricity mix in 2013).

INVESTMENT ATTRACTIVENESS

- Saudi Arabia has targets to increase electricity generation from renewable power, despite the lack of a clear climate strategy. Support policies to achieve this target have yet to be implemented. Fossil fuels are significantly subsidized.
- Reliability for sustained support is very low as support has been missing in the past and predictability of its green policies is significantly limited due to the country's relatively poor governance variables.
- Absorption capacity is very low as Saudi Arabia has no significant activity with renewables and hosts no major renewable energy businesses.
- Saudi Arabia's push to provide attractive and stable markets for investors is reflected in its good performance among the non-OECD G20 countries (3rd). Overall, the country scores very low in macro-economic fundamentals, medium in the non-financial determinants and high in the financial depth.

- Absolute investment needs
- Investment needs relative to electricity consumption
- Vulnerability of electricity supply

¹ Share of total electricity generation, excl. large hydro

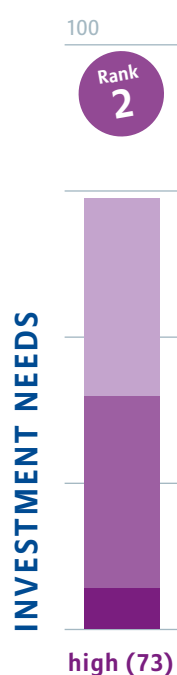
SOUTH AFRICA

General Info

Population: 54,001,953 (2014)
 GDP / cap: USD 12,446 (2014)
 Renewables share¹: 0.2% of total generation (2013)



SCORE SUMMARY



Policy adequacy

	medium (45)
Climate strategy	medium
Renewables target	very high
Long-term transition strategy	very low
Support schemes	medium
Fossil fuel subsidies	existing

Policy reliability

	low (37)
Predictability	low
Historic reliability	low

Market absorption capacity

	low (22)
Technology experience	very low
Current renewables activity	very low
Presence of businesses	high

National investment conditions

	medium (43)
Non-financial determinants	medium
Depth of financial sector	high
Price stability	very low

INSIGHTS

INVESTMENT NEEDS

- Very high investment needs relative to electricity demand. Absolute investment needs are approximately USD₂₀₁₂ 14 billion per year, up to 2035. South Africa still has a significant share of its population without electricity access (15%), creating additional investment needs.
- Vulnerability of power infrastructure to climate change impacts due to complete dependence on thermal and nuclear energy (98% of electricity mix in 2013).

INVESTMENT ATTRACTIVENESS

- South Africa has a very ambitious renewables targets, but support policies to reach them are limited with e.g. an auction system.
- Though parties generally apprehend the importance of decarbonizing the country's electricity sector, political progress has been slow in the past and fossil fuel lobby groups dominate the public debate. This makes implications of a change of government difficult to predict.
- As the major regional economy of Sub-Saharan Africa, South Africa hosts representations of a high proportion of the world's major renewable energy companies, despite the relatively low historical and present activity with renewables.
- The comparatively low score for the inflation forecast pulls down South Africa's medium and high performance in non-financial and financial determinants, landing it at the 11th position among the G20. The silver lining is its relatively good performance among the non-OECD countries, scoring 2nd only to China.

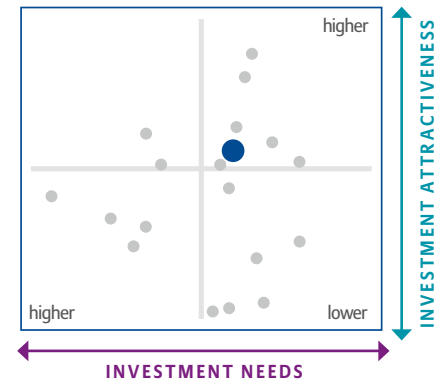
■ Absolute investment needs
 ■ Investment needs relative to electricity consumption
 ■ Vulnerability of electricity supply

¹ Share of total electricity generation, excl. large hydro

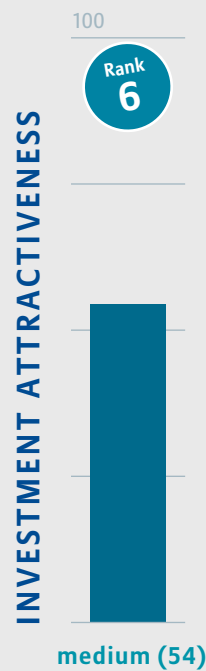
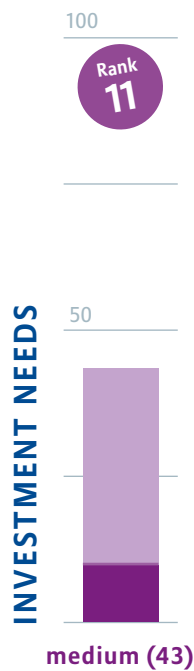
SOUTH KOREA

General Info

Population: 50,423,955 (2014)
 GDP / cap: USD 33,629 (2014)
 Renewables share¹: 0.8% of total generation (2013)



SCORE SUMMARY



Policy adequacy

	medium (45)
Climate strategy	medium
Renewables target	medium
Long-term transition strategy	medium
Support schemes	medium
Fossil fuel subsidies	existing

Market absorption capacity

	very low (15)
Technology experience	very low
Current renewables activity	very low
Presence of businesses	low

Policy reliability

	very high (80)
Predictability	high
Historic reliability	very high

National investment conditions

	high (74)
Non-financial determinants	high
Depth of financial sector	very high
Price stability	high

INSIGHTS

INVESTMENT NEEDS

- Low investment needs compared to other G20 countries, relative to electricity demand. Absolute investment needs are approximately USD₂₀₁₂ 17 billion per year, up to 2035.
- High vulnerability of power infrastructure to climate change impacts due to near-complete dependence on thermal and nuclear energy (97% of electricity mix in 2013).

INVESTMENT ATTRACTIVENESS

- South Korea has the electricity system with the highest performance worldwide and plans to finalize a nationwide Smart Grid by 2030. Its further ambitions, however, lack sufficient determination. For instance, there is no plan for a deep decarbonization.
- South Korea has been rather determined in developing low-carbon energy transition measures while long-term predictability is limited due to significant differences between major parties.
- Less than 1% of the electricity mix is supplied by renewables, mostly solar, current activity remains low.
- South Korea gets high scores in non-financial and macroeconomic determinants and very high in financial determinants, giving it a high score in its general investment conditions.

■ Absolute investment needs
 ■ Investment needs relative to electricity consumption
 ■ Vulnerability of electricity supply

¹ Share of total electricity generation, excl. large hydro

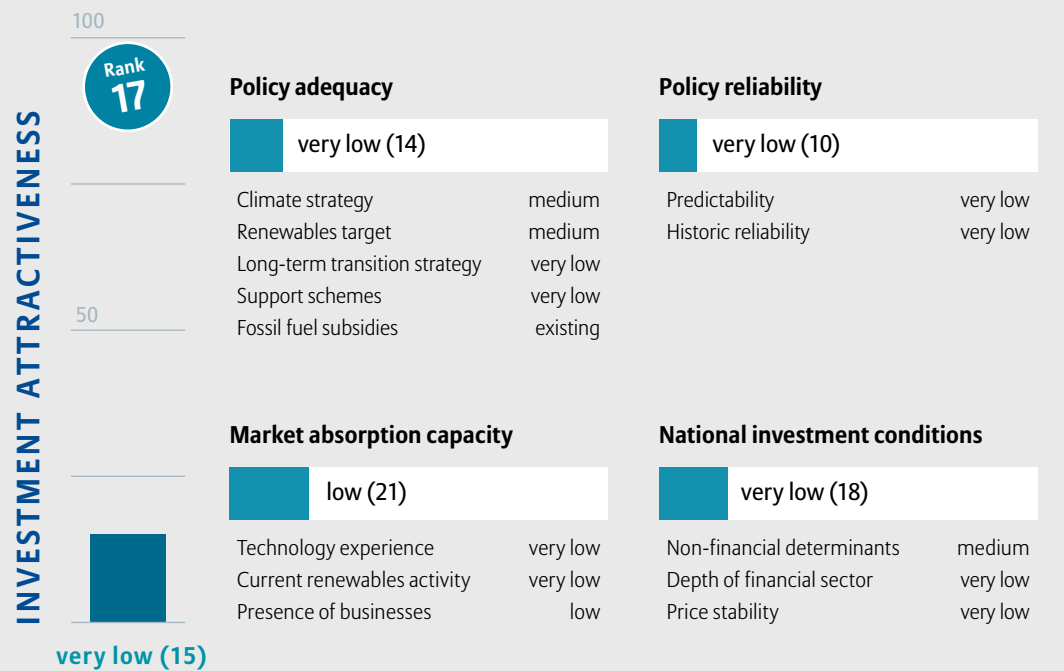
TURKEY

General Info

Population: 75,932,348 (2014)
 GDP / cap: USD 18,869 (2014)
 Renewables share¹: 4.1% of total generation (2013)



SCORE SUMMARY



INSIGHTS

INVESTMENT NEEDS

- Relatively low absolute investment needs, compared to other G20 countries. Absolute investment needs are approximately USD₂₀₁₂ 9 billion per year, up to 2035.
- Vulnerability of power infrastructure to climate change impacts due to high dependence on both hydro (23% of electricity mix, average generation between 2009-2013) and thermal and nuclear (71% of electricity generation, in 2013).

INVESTMENT ATTRACTIVENESS

- Turkey has climate strategies with defined objectives and measures on a low ambition level. Plans for decarbonization or grid expansion do not exist. Furthermore, there are plans to build a large number of coal-fired power plants as well as tax breaks for coal-fired power plants.
- Under AKP rule, Turkey effectively rejected support for a low-carbon energy transition – backed by a strong fossil fuel lobby. Predictability is limited based on the country's partially poor governance variables.
- Despite considerable potential for solar and geothermal energy in Turkey, the application of these technologies has been very limited to date. Wind power plays a slightly more significant role.
- Recent political instability along with relatively poor macroeconomic and governance variables leads Turkey to score lowest among the OECD countries and third-lowest among all G20, also pulling down its overall performance in the investment attractiveness pillar.

■ Absolute investment needs
 ■ Investment needs relative to electricity consumption
 ■ Vulnerability of electricity supply

¹ Share of total electricity generation, excl. large hydro

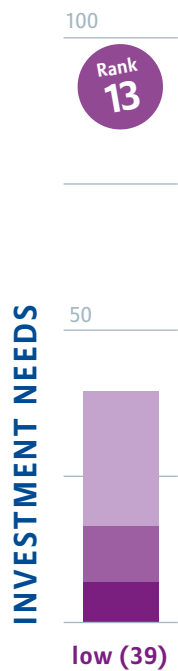
UNITED KINGDOM

General Info

Population: 64,510,376 (2014)
 GDP / cap: USD 38,177 (2014)
 Renewables share¹: 13.7% of total generation (2013)



SCORE SUMMARY



Policy adequacy

high (72)

Climate strategy	high
Renewables target	very high
Long-term transition strategy	very high
Support schemes	high
Fossil fuel subsidies	existing

Policy reliability

medium (57)

Predictability	medium
Historic reliability	high

Market absorption capacity

high (72)

Technology experience	high
Current renewables activity	high
Presence of businesses	medium

National investment conditions

very high (92)

Non-financial determinants	very high
Depth of financial sector	very high
Price stability	very high

INSIGHTS

INVESTMENT NEEDS

- Investment needs, both in absolute and relative terms, are slightly below average compared to other G20 countries. Absolute investment needs are approximately USD₂₀₁₂ 14 billion per year, up to 2035.
- Vulnerability of power infrastructure to climate change impacts due to high dependence on thermal and nuclear energy (84% of electricity mix in 2013).

INVESTMENT ATTRACTIVENESS

- The UK has high ambitions for the short-term and long-term and follows strong strategies. It provides financial support for renewables as a 'strike price' mechanism while fossil fuels are balanced with a carbon tax.
- Parties are determined on finding solutions for a low-carbon energy transition. However, fossil fuel lobby groups engage proactively in decision-making processes and take meaningful influence.
- The United Kingdom has the third-highest share of renewable electricity amongst G20 countries, and a high rate of installations of wind energy, but limited presence of major renewable energy companies.
- UK scores second-best to France in the general investment conditions.

■ Absolute investment needs
 ■ Investment needs relative to electricity consumption
 ■ Vulnerability of electricity supply

¹ Share of total electricity generation, excl. large hydro

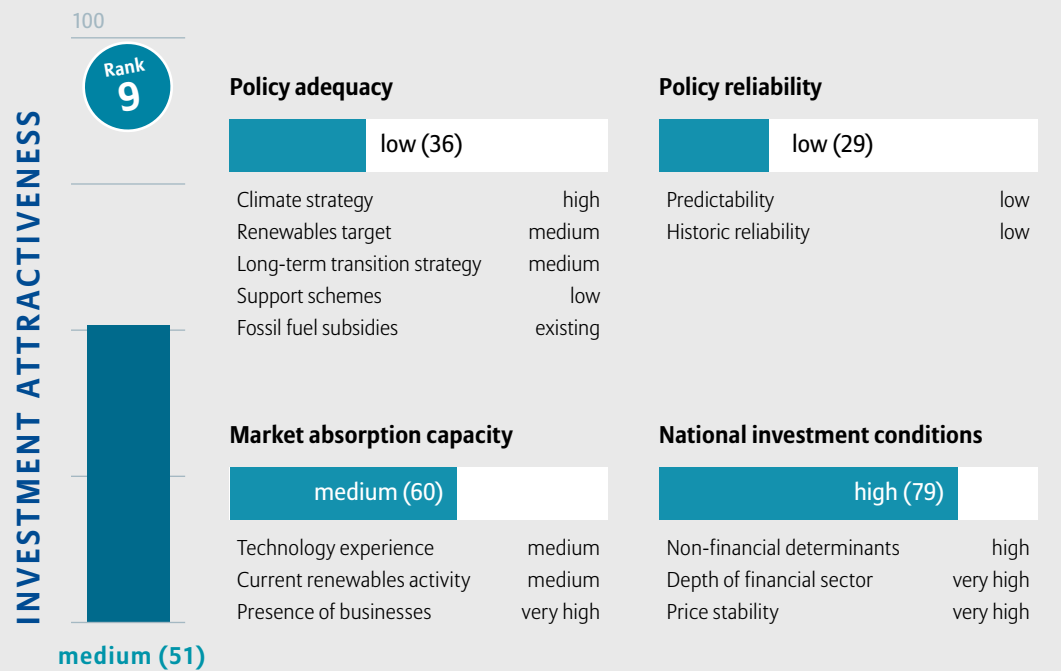
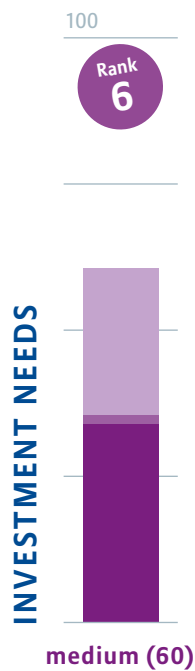
UNITED STATES

General Info

Population: 318,857,056 (2014)
 GDP / cap: USD 52,117 (2014)
 Renewables share¹: 6.3% of total generation (2013)



SCORE SUMMARY



INSIGHTS

INVESTMENT NEEDS

- Second-largest absolute investment needs from all G20 countries with approximately USD₂₀₁₂ 141 billion per year, up to 2035.
- Vulnerability of power infrastructure to climate change impacts due to high dependence on thermal and nuclear energy (87% of electricity mix in 2013).

INVESTMENT ATTRACTIVENESS

- The US currently implements individual measures under the Climate Action Plan – a continuation depends on future presidential elections. The federal ambition and support for renewables is relatively low, between the individual states the level of ambition varies.
- With the presidential election coming up, political opponents are highly divided upon the issue of the country's climate policy future.
- The United States as a whole only has an average level of activity with renewables compared to G20 countries, but its commercial and regional importance means that there is a presence of nearly all of the world's major renewable energy companies.

■ Absolute investment needs
 ■ Investment needs relative to electricity consumption
 ■ Vulnerability of electricity supply

¹ Share of total electricity generation, excl. large hydro



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