

ADVANCING CLIMATE ACTION UNDER ARGENTINA'S G20 PRESIDENCY

BRIEFING PAPER

April 2018



MAIN MESSAGES FOR THE G20

- **Infrastructure for development:** G20 countries still provide large amounts of public finance for high-carbon infrastructure that is economically and environmentally unsustainable. This investment must be completely shifted to sustainable and low-carbon infrastructure. The G20 finance track must establish common definitions and benchmarking criteria to focus investment on low-carbon and climate-resilient infrastructure.
- **Energy transitions:** G20 countries provided US\$ 230 billion in subsidies to coal, oil and gas in 2014. The G20 has committed to end fossil fuel subsidies every year since 2009. It must now commit to a specific phase-out date – ideally in line with the G7 deadline of 2025. The G20 Energy Transitions Working Group should also convene a dialogue on carbon pricing to support the full decarbonisation of energy systems by 2050.
- **Long-term low emission development:** Several G20 countries have not yet prepared a long-term low emission development strategy for submission to the United Nations Framework Convention on Climate Change (UNFCCC). The G20 Climate Sustainability Working Group should push for accelerated timelines for drafting and submitting long-term strategies before 2020, including the goal of achieving zero emissions from the energy sector by 2050.

About this paper:

This briefing paper provides an overview of the G20 working structure and agenda items relating to climate action, sustainable finance and infrastructure development under Argentina's G20 Presidency. It presents specific options for G20 action and ambition in 2018.

The paper's intended target audience is policy makers involved in the G20 process who are working on issues related to climate action, sustainable finance and infrastructure development, and stakeholders from think tanks, business and civil society who strive to engage in G20 advocacy work.

The paper is part of Climate Transparency's activities to enhance ambitious climate action in G20 countries. The international partnership's Brown to Green Report assessing G20 climate action (mitigation, finance and vulnerability) will be published in the month before the Summit in Argentina due to be held on 30 November to 1 December 2018. Previous G20 Brown to Green reports can be downloaded here: www.climate-transparency.org

INTRODUCTION

Argentina took over the G20 Presidency on 1 December 2017 with three agenda priorities: 1) the future of work; 2) infrastructure for development; and 3) a sustainable food future. Climate change affects and is affected by each of these priorities and thus must be an important focus for working groups under the Sherpa and the Finance Tracks this year.

Climate change, renewable energy and green investments have been on the G20 agenda since the 2012 Mexican Presidency¹ and gained momentum under the Chinese Presidency in 2016 with a strong focus on green finance. Under Germany's Presidency in 2017, G20 countries agreed on the most comprehensive climate package at the G20 to date. In the final communiqué, all G20 countries committed to work towards low greenhouse gas emission energy systems (G20 Germany, 2017). Nineteen leaders, excluding the United States, also stated that "the Paris Agreement is irreversible" and agreed to the annexed G20 Hamburg Climate and Energy Action Plan for Growth (CEAP) (G20, 2017). The work of the Green Finance Study Group and the Task Force on Climate-related Financial Disclosures has provided tools for aligning financial flows with low-carbon development. Now in 2018, there are significant opportunities for Argentina to continue the leadership of the G20 on climate action (GFSG, 2017; TCFD, 2017).

This briefing paper discusses the Argentine G20 agenda and the pathways within it for action on climate change, as well as providing highlights of G20 climate performance thus far.

- **Section A** explains the G20 working structure under the Argentine G20 Presidency and provides an overview of the working groups that are directly or indirectly linked to climate goals.
- **Section B** discusses how the G20 can push for more ambitious climate action. It focuses on:
 1. the **Infrastructure Working Group**, under the Finance Track; and
 2. the **Climate Sustainability** and the **Energy Transitions Working Groups**, under the Sherpa Track.

A. G20 WORKING STRUCTURE

The Argentine G20 Presidency will hold meetings at various government levels under the two main work streams of the G20 – the Finance Track and the Sherpa Track (see Figure I) (G20 Argentina, 2018).

The **Finance Track** deals with the traditional issues of the G20 related to financial stability and economic growth. Meetings convene representatives from the G20 Finance Ministries and Central Banks and are organised by the Argentine Ministry of the Treasury and the Central Bank.

The Finance Track is central for driving climate action. The transition to a low-carbon climate-resilient economy involves mobilising public and private finance as well as shifting away from investing in fossil fuels. It thus demands action from a number of public and private actors including those who are central for climate for whom climate is not central in their day-to-day roles, responsibilities and priorities, such as finance ministries, financial institutions and private finance actors.

The **Infrastructure Working Group** in the Finance Track offers the opportunity to promote coherence between the Paris Agreement and the Sustainable Development Goals (SDGs) and the need for increased infrastructure investment. In addition, the **Sustainable Finance Study Group**,² continuing the efforts of the Green Finance Study Group, can achieve progress in aligning financial flows with low-carbon development.

The **Sherpa Track** is dedicated to a broader portfolio (e.g. Climate, Education, Health³) and is coordinated by the Chief of Cabinet of Ministers and the relevant ministries from each topic area. Technical officials, deputies and ministers discuss agenda items in their respective issue areas. The Sherpas, personal representatives of the leaders of each member country, seek consensus at the highest political level and pre-negotiate the final summit declaration.

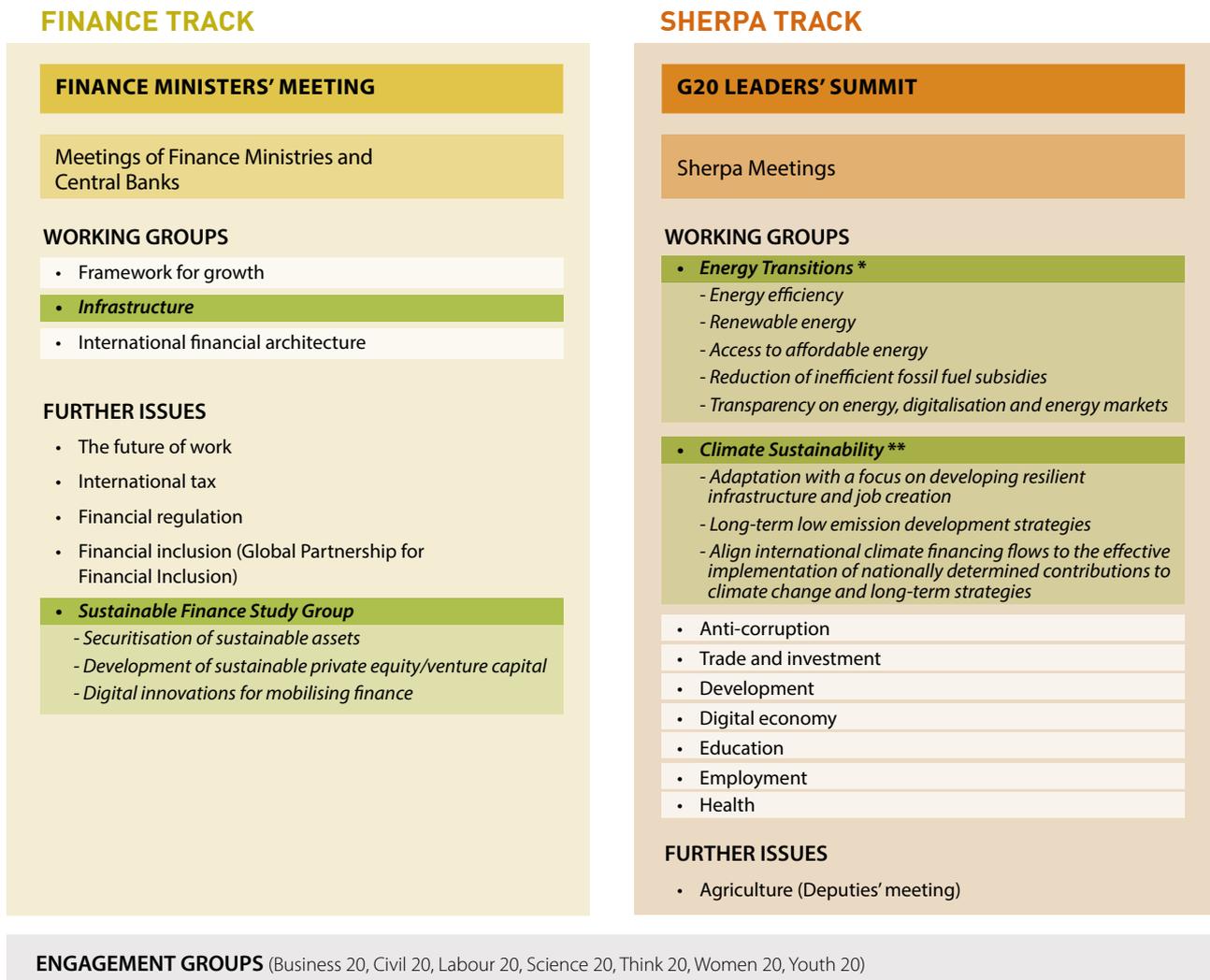
During the Argentine G20 Presidency, climate-related issues figure prominently under the Sherpa track with 1) the **Energy Transitions Working Group**; and 2) the **Climate Sustainability Working Group**. Under the German G20 Presidency, climate and energy were combined in one working group – the Sustainability Working Group. Argentina for the first time established a specific working group on climate action within the G20 and therefore now needs to ensure that the interrelatedness of climate and energy issues will be reflected in both groups.

1 Ending fossil fuel subsidies has been a focus since 2009 in Pittsburg (G20 USA, 2009).

2 The G20 Sustainable Finance Study Group is co-chaired by the People's Bank of China and the Bank of England and convenes representatives from G20 members and international organisations (PBC, 2018).

3 These topics might be but are not necessarily discussed in light of financial stability and economic growth.

Figure I: G20 working structure of the Argentine Presidency 2018



Main G20 Working or Study Groups that focus on climate change and/or need to align their work with climate objectives

* coordinated by Argentinian Ministry of Energy and Mining

** coordinated by Argentinian Ministry of the Environment and Sustainable Development

Source: Own figure based on G20 Argentina, 2018

B. HOW THE G20 CAN ADVANCE AMBITIOUS CLIMATE ACTION

Finance Track and Climate Action

1. Infrastructure Working Group: Investment needs to shift to low-carbon climate-resilient infrastructure

As one of its three priorities, the Argentine G20 Presidency stresses the importance of infrastructure for human and economic development as well as the huge investment required. The global infrastructure gap projected from now to the year 2035 amounts to US\$ 5.5 trillion (República Argentina, 2017). To increase the mobilisation of private investments, the G20 aims to develop infrastructure as a new asset class (ibid.).

This investment will however only be economically sustainable if the supported infrastructure is climate-resilient and low-carbon. Smart infrastructure investments will help countries to better prepare for future climate risks – for example, caused by floods and droughts. Due to the high capital intensity and long life-spans of infrastructure, it will also prevent a lock-in of unsustainable patterns and potentially stranded assets (NCE, 2016).

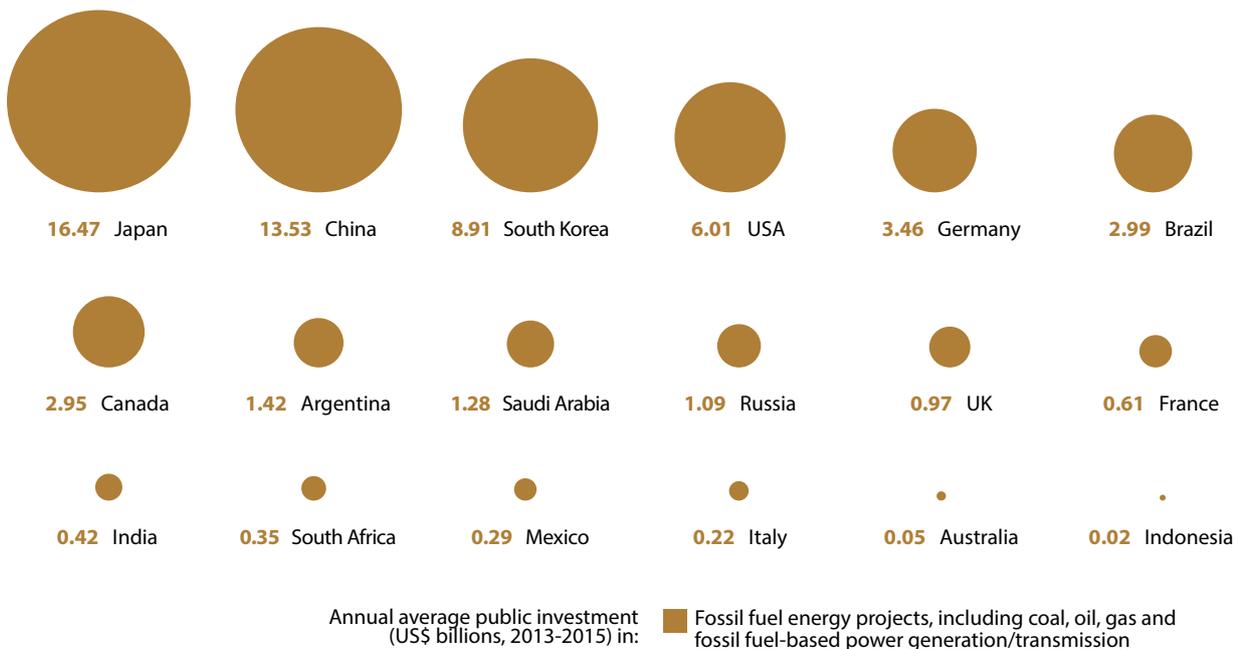
Low-carbon infrastructure can create more and better jobs – the second of the three priorities under the Argentine G20 Presidency. If accompanied by the right policy mix, the green economy could

yield up to 60 million jobs globally between 2012 and 2032 (ILO, 2012). For example, in 2016, 9.8 million people worldwide were employed in the renewable energy sector (IRENA, 2017).

Investing in sustainable infrastructure thus responds to three global challenges: reigniting growth, delivering on the Sustainable Development Goals and reducing climate risk in line with the Paris Agreement (NCE, 2016). Because of lock-in of capital and technology and a shrinking carbon budget,⁴ the next two years are crucial in bringing about a fundamental change of direction (ibid.).

In addition to mobilising public and private finance for low-carbon infrastructure, there needs to be a shift in current financing from “brown” to “green” infrastructure. Through development finance institutions (DFIs), including multilateral development banks (MDBs), G20 countries still provide large amounts of public finance for fossil fuel-based infrastructure. For example, between 2013 and 2015, G20 countries provided US\$ 72 billion a year for fossil fuel energy projects, while just US\$ 19 billion supported clean energy projects such as wind, solar, geothermal and small hydro (Climate Transparency, 2017 based on Oil Change International et al., 2017). Japan and China, providing between US\$ 17 billion and US\$ 19 billion in public finance each year for brown energy, rank worst in absolute terms, while South Korea and Japan are worst offenders relative to GDP (ibid.) (See Figure II.)

Figure II: **Public finance in G20 countries for brown energy remains very high**



Source: Oil Change International, 2017

4 The amount of carbon dioxide emissions that can be emitted worldwide while still having a likely chance of keeping to the Paris Agreement limits of global warming.

G20 countries can scale up and shift public and private investments to low-carbon climate-resilient infrastructure through the following measures.

- **Tackle fundamental price distortions** by phasing out fossil fuel subsidies and by establishing carbon pricing (see section 2.3).
- **Strengthen investment policy frameworks** by developing long-term low emission development plans and adopting key principles, ensuring the integration of climate risk and climate objectives in national infrastructure plans and policies (NCE, 2016).
- **Transform the financial system to deliver the scale and quality of investment needed** by agreeing on common standards, scaling up green bonds and developing policies that support the implementation of the recommendations of the Task Force for Climate-Related Financial Disclosures (ibid.). MDBs also have several possibilities to align their portfolios with the Paris Agreement goals including the use of well below 2°C/1.5°C compatible investment criteria, exclusion lists for emission-intensive projects and the use of shadow carbon pricing (OECD, 2017a).⁵ Several initiatives such as the Standard for Sustainable and Resilient Infrastructure and the Global Real Estate Sustainability Benchmark as well as MDBs have worked on climate-relevant investment criteria, albeit to various degrees (Bingler et al., 2017; Nakhoda and Watson, 2016).
- **Support clean technology research and development (R&D)** and deployment by tripling public investment, removing barriers to entrepreneurship and establishing research partnership across sectors (NCE, 2016).

Under the Argentine G20 Presidency, the Sustainable Finance Study Group (formerly the G20 Green Finance Study Group⁶) supports the Infrastructure Working Group regarding its sub-focus on ESG (environmental, social and governance) factors and transforming the financial system (Alexander, 2018; PBC, 2018).

The Infrastructure Working Group can advance climate action through the following steps:

- Commit to transition to low-carbon, climate-resilient infrastructure planning and investment by: a) tackling price distortions; b) strengthening investment policy frameworks; c) transforming the financial system; and d) supporting clean technology R&D and deployment.
- Invite DFIs, including MDBs, to establish a common definition, standards and safeguards for sustainable infrastructure based on the work of the Sustainable Finance Study Group that can be used to shape public and private infrastructure investment in line with the Paris Agreement (Article 2.1c) and the SDGs, including the development of well below 2°C/1.5°C and climate-resilient investment criteria.
- Commit to developing policies that implement the recommendations of the Task Force on Climate-related Financial Disclosures and apply them as public infrastructure financing institutions, setting a good example.
- Commit to more transparency and participation in the decision-making process of public infrastructure projects, including in public contracting.
- Share experience on how investment in low-carbon, climate-resilient infrastructure fosters economic growth and job creation.

⁵ For example, the World Bank announced in December 2017 that it will no longer invest in upstream oil and gas after 2019 (World Bank, 2017).

⁶ Under the Chinese and German G20 Presidencies in 2016 and 2017 respectively, the Green Finance Study Group “identified institutional and market barriers to green finance, and based on country experiences, developed options on how to enhance the ability of the financial system to mobilize private capital for green investment” (GFSG, 2017). Much of its work will be taken forward under the Sustainable Finance Study Group in 2018.

Sherpa Track and Climate Action

1. Climate Sustainability Working Group: Long-term low emission strategies, infrastructure planning and financing need a coherent approach

The Climate Sustainability Working Group focuses on the following **three issues** (G20 Argentina, 2018).

1. Adaptation to climate change and extreme weather events with a focus on the development of resilient infrastructure and job creation.
2. Long-term low greenhouse gas emission development strategies with a focus on approaches and methodologies for their design.
3. Aligning international climate finance flows to the effective implementation of nationally determined contributions (NDCs) to climate change, and to long-term low greenhouse gas emission development strategies.

The Climate Sustainability Working Group has planned to produce **two outputs**:

- a two to three page summary of the working group's discussions and good practices of G20 countries with regard to the three focus topics, highlighting best practices.
- a progress report of the Hamburg Climate and Energy Action Plan for Growth (CEAP) featuring good practices submitted voluntarily by each country.

1.1 Adaptation with a focus on the development of resilient infrastructure and job creation

Argentina is striving to give more weight to the issue of resilience to climate change in the G20 discussions, since this is a central concern for Latin America and the Caribbean. Adapting to climate change – becoming more resilient to its impacts – can protect economic growth and development progress, so it is important, particularly for G20 developing nations. The CEAP focuses mostly on mitigation and finance, containing only one page on enhancing climate resilience and adaptation efforts. Within this, it encourages multilateral institutions to scale up adaptation finance for developing countries and to develop options for innovative climate and disaster finance solutions (G20, 2017). This year's Climate Sustainability Working Group aims to discuss adaptation in light of sustainable infrastructure development (G20 Argentina, 2018).

The number and costs of disasters globally is increasing (Watson et al., 2015) and climate change will increase the frequency and intensity of climate-related natural hazards (IPCC, 2014). Infrastructure, central to a country's economic growth and development, with a long life-span, must be informed by current and future risk in order to decrease its own vulnerability as well as to build society's resilience to

climate change impacts (Watson and Kellett, 2016).

While there are a number of complexities in the adaptation and infrastructure agenda, there has been progress (Nakhouda and Watson, 2016). In addition to the expansion of financial contingency planning (via contingency funds and catastrophe bonds, for example), there are increasing risk transfer and pooling instruments, such as insurance, that can support resilience-building (CCRIF SPC, 2018; Bhattacharya, 2016). A further task for the G20 will be to ensure that new approaches to building resilient infrastructure also include opportunities for job creation in the context of a just transition to low-carbon, climate-resilient futures.

The Climate Sustainability Working Group can advance climate action through the following steps:

- Commit to mainstream climate resilience into national infrastructure policies and plans and share country practices on implementation.
- Progress best practice for financing climate-resilient infrastructure and climate-resilient economies.
- Share knowledge on what a just transition towards low-carbon, climate-resilient economies entails and on which policies need to be considered for this.

1.2 Long-term low greenhouse gas emission development strategies

Long-term low greenhouse gas emission development strategies that lay out national emission reduction targets and strategies until 2050, are critical to limiting global warming to well below 2°C/1.5°C. They address path dependency within development choices and influence the risk-return profile of investors.

The Paris Agreement (Article 4.19) states that all countries should submit long-term strategies to the UNFCCC. It does not provide terms of reference for the development of long-term strategies. Dialogue between governments, and between governments and stakeholders is thus necessary to establish a set of shared best practices and norms (IDDRI, 2016). The design of long-term strategies should explicitly address, among others, the following elements: rapid decarbonisation of the energy system, sectoral mitigation analysis and resilience assessment, integration of decarbonisation measures into national law, a financing framework, and a just transition including open space for democratic consultation (Hansen et al., 2017).

Canada, France, Germany, Mexico and the United States⁷ have already submitted their long-term strategies (UNFCCC, 2018). The G20 governments of the EU, Japan, South Africa and the United Kingdom have long-term strategies in place although not yet submitted to the UNFCCC. In Hamburg, the G20 countries reaffirmed their commitment to submit their own long-term strategies to the UNFCCC before 2020 (G20, 2017).

7 Non-G20 countries include Benin and the Czech Republic (UNFCCC, 2018).

Table I: **Examples of G20 countries – Long-term low greenhouse gas emission development strategies**

 Canada	<p>Canada presented its Mid-Century Long-Term Low Greenhouse Gas Development Strategy in 2016. It outlines an 80% reduction in emissions from 2005 levels by 2050. The strategy is not policy descriptive, but describes modelling analyses illustrating various scenarios towards deep emissions reductions. It identifies the policy areas in which emissions reductions will be more challenging and where policy focus is needed (Government of Canada, 2016).</p>
 Germany	<p>Germany presented its Climate Action Plan 2050 in 2016. It is in line with the EU goal of an 80% to 95% cut from 1990s levels and includes a mid-term target of 55% emissions reduction by 2030. Strategic measures include: sectoral emission targets, a road map towards an almost climate-neutral building stock, and a commission for growth, structural change and regional development, bringing together stakeholders from different sectors to develop strategies to implement the Climate Action Plan by the end of 2018 (BMUB, 2016).</p>
 Mexico	<p>In 2016, Mexico presented its Climate Change Mid-Century Strategy. It aims to halve emissions from 2000. Next to mitigation, it includes a vulnerability assessment and actions on adaptation (SEMARNAT-INECC, 2016).</p>

The Climate Sustainability Working Group can advance climate action through the following steps:

- Provide clear signals that the commitment of all G20 members to provide long-term strategies before 2020 is on track, and work towards a zero-carbon target for 2050 to stay within the Paris Agreement limits.
- Create a G20 cooperation system, with an exchange of experiences, to achieve a stronger commitment in terms of long-term strategies and their submission to the UNFCCC.
- Share knowledge on practices on how to project and track emission development as well as on how to implement the long-term strategies.

1.3. Aligning international climate finance flows to the effective implementation of the NDCs and long-term strategies

In order to mobilise national and international public and private sources for the implementation of nationally determined contributions (NDCs) and long-term strategies, it is important to understand investment and financing needs. Based on these needs assessments, policy makers can establish detailed implementation and investment plans (GIZ, 2017).

However, only a few NDCs and no long-term strategies to date include detailed financial assessments that enable an understanding of the investment and financing needs.

The **national mobilisation** of public and private finance for NDCs and long-term strategies is supported by green/sustainable finance policies and fiscal policy levers (fiscal policy levers are further elaborated in section 2.3).

Under both the Chinese and German Presidencies, the G20's Green Finance Study Group investigated the barriers and options for mobilising green finance. The Sustainable Finance Study Group will continue this work in 2018. The Task Force on Climate-related Financial Disclosures (TCFD) published recommendations in July 2017 for risk disclosure by companies to provide better information to investors, lenders, insurers and other stakeholders. The Financial Stability Board suggested that companies should apply these recommendations (TCFD, 2017).

A large number of developing countries' NDCs are conditional on the provision of **international climate finance**. The Paris Agreement reaffirmed the earlier commitment of developed countries to mobilise US\$ 100 billion per year for developing countries by 2020 from both public and private sources. The CEAP from 2017 confirms this commitment by the developed countries that are G20 members (G20, 2017). After 2025, the mobilisation of higher annual funding must be agreed upon to limit global warming to well below 2°C/1.5°C (GIZ, 2017).

Table II: **Examples of G20 countries aligning financial flows with the Paris Agreement**

 China	Green finance strategy: In 2016, the State Council approved the “Guidelines for Establishing the Green Financial System” to incentivise and promote green loans, green bonds, green funds, green insurance, and mandatory environmental information disclosures (UNEP Inquiry, 2017).
 France	Disclosure: With Art. 173 of its Energy Transition Law, France became the first country to pass a law introducing mandatory climate-related reporting for asset owners and asset managers in 2015 (Assemblée Nationale, 2015).
 India	Lending requirements for banks: The Reserve Bank of India has included lending to small renewable energy projects within the targets of its Priority Sector Lending requirement (UNEP Inquiry, 2017).
 India and South Africa	Finance assessments in NDCs: India assessed financial needs until 2030 to be as much as US\$ 2.5 trillion (India INDC, 2015). South Africa estimates needs worth US\$ 31.5 billion between 2020 and 2030 (South Africa INDC, 2015). ⁸

The Climate Sustainability Working Group can advance climate action through the following steps:

- Commit to draft finance plans for the NDCs and long-term strategies based on identified investment needs.
- Commit to early national adoption of the TCFD recommendations and invite the Financial Stability Board to establish a platform that drives the implementation and further development of TCFD recommendations by:
 - a) sharing experience on implementing climate-related financial disclosure policies;
 - b) developing model legislation for financial disclosure; and
 - c) establishing assessment mechanisms for the recommendations.
- Continue to work towards meeting the developed G20 members’ commitments under the UNFCCC that at least US\$ 100 billion per year will be mobilised from public and private sources to help developing countries mitigate and adapt to climate change by 2020. Furthermore, work to ensure an ambitious, new and bigger goal to be agreed by 2025.

2. Energy Transitions Working Group: Energy policies need to be aligned to the necessary decarbonisation of the energy sector by 2050

The Energy Transitions Working Group focuses on **the following issues** (G20 Argentina, 2018):

1. Energy efficiency
2. Renewable energy
3. Access to affordable energy in Latin America and the Caribbean
4. Phasing out fossil fuel subsidies
5. Transparency of energy information
6. Digitalisation of energy markets.

This paper focuses on energy efficiency, renewable energy and phasing out fossil fuels subsidies, linking this to carbon pricing.

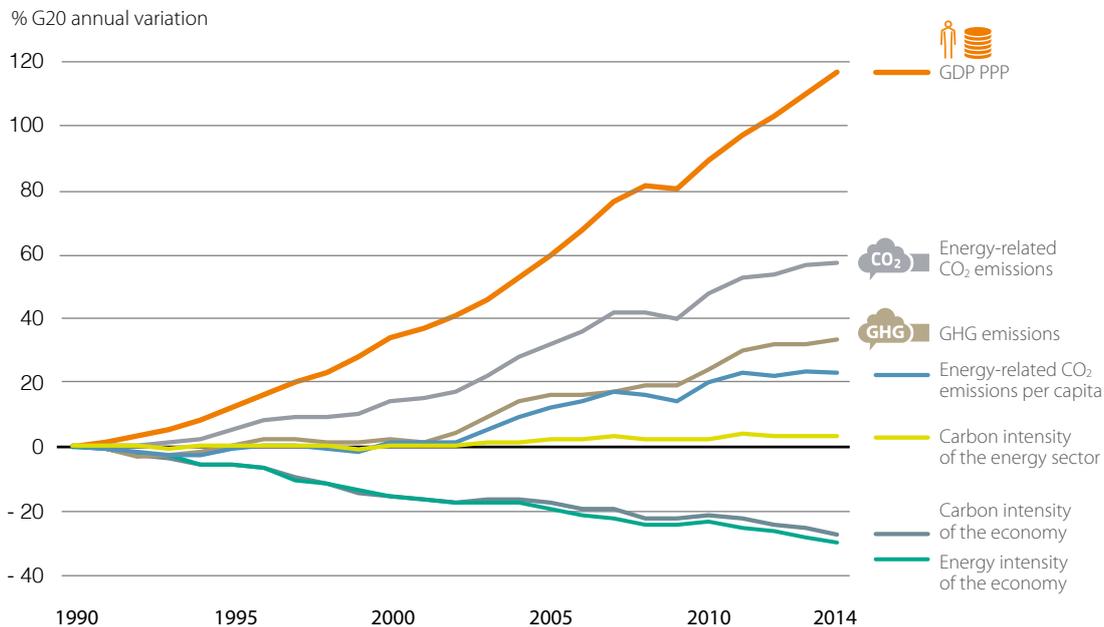
2.1 Energy efficiency

G20 economies are becoming more efficient – both the energy intensity and the carbon intensity of the economies concerned are decreasing. However, as both energy consumption and economies have grown, this higher efficiency has not been enough to bring an overall reduction in greenhouse gas emissions (see Figure III). G20 countries with the highest levels of energy intensity of their economies (2014) are Canada, China, the Russian Federation and South Africa. Italy and the United Kingdom have the lowest energy intensity level (Climate Transparency, 2017).

Energy efficiency is often a cost-effective mitigation measure (sometimes even with net negative costs). The International Energy Agency (IEA) also regards energy efficiency as a tool for economic and social development. Positive impacts range from decreased energy bills to savings in public budgets, and from health and wellbeing to employment creation (IEA, 2015).

⁸ However, it is worth noting the considerable divergence in the methods and coverage that countries have adopted in the assessment of NDC financial needs (Hedger and Nakhoda, 2015).

Figure III: **Energy efficiency and key indicators on the G20 transition to a low-carbon economy**



Source: Climate Transparency, 2017; based on IEA, 2016; PRIMAP, 2017; World Bank, 2017

Key short-term actions on energy efficiency in different sectors will significantly contribute to keeping global warming in line with the Paris Agreement, particularly with regards to the 1.5°C objective (Kuramochi et al., 2017). These actions include among others:

Buildings

- All new buildings to be fossil-free and near-zero energy by 2020.
- Increase building renovation rates from less than 1% in 2015 to 5% by 2020.

Industry

- All new installations in emissions-intensive sectors to be low-carbon after 2020; maximise material efficiency.

Transport

- A gradual improvement to fuel standard efficiency is an important energy efficiency measure in the transport sector but would likely not be sufficient to meet the 1.5°C goal. In order to meet the more stringent requirements of the Paris Agreement, the last fossil fuel passenger car should be sold by 2035–2050.

Energy efficiency has been on the G20 agenda for several years. In 2017, the CEAP called for a task force to be set up to develop the terms of reference for an Energy Efficiency Hub to foster coherence in international collaboration in energy efficiency. The task force will report to the Energy Transitions Working Group in 2018 (G20, 2017).

The Argentine G20 Presidency will build upon the G20 Energy Efficiency Leading Programme (EELP) – the G20’s first long-term framework for energy efficiency – and the G20 Energy Efficiency Investment Toolkit (EIT). It will provide voluntary options for participating G20 members to enhance capital flows towards energy efficiency. It will focus on specific measures that may help encourage a behavioural change in energy use and explore how this could be reflected in specific educational and awareness initiatives. However, behavioural and educational initiatives alone cannot be very effective as long as prices do not reflect the true cost of fossil fuels and regulation does not support shifts in behaviour (see section 2.3).

The Energy Transitions Working Group can advance climate action through the following steps:

- Commit to establish energy efficiency measures in the building, energy and transport sectors as outlined above to stay in line with the Paris Agreement goals and share practices on how to do this.
- Continue to implement the G20 Energy Efficiency Leading Programme and explore new institutional frameworks to strengthen energy efficiency cooperation.
- Get commitments from all G20 countries to increase investments in energy efficiency by applying the Energy Efficiency Investment Toolkit.
- Adopt the terms of reference of the newly planned Energy Efficiency Hub.

2.2 Renewable energy

The absolute renewable energy supply has been increasing in most G20 countries. China, the Republic of Korea, Turkey and the United Kingdom have experienced strong growth in absolute renewable energy supply. Nevertheless, the share of renewable energy (excluding traditional biomass, but including hydro) remains rather low in most G20 countries as coal and other fossil fuels dominate the energy mix (see Figure IV) (Climate Transparency, 2017).

The objectives of the Paris Agreement translate to a rapid decarbonisation of the energy sector – this is particularly true for the electricity sector, which will need to decarbonise by around mid-century (Rogelj et al., 2015).

All G20 countries will need to substantially increase zero-carbon energy supply while ensuring environmental integrity, much of which can be achieved with renewable energies. The costs of renewable energy technology have decreased rapidly during the last few years and are now often even on a par or lower than those of fossil technologies, particularly in the electricity sector (IRENA, 2018).

A full decarbonisation of the energy sector entails a deep paradigm shift that goes beyond merely switching from one technology to another. Significant investments will be needed to upgrade grid infrastructure and interconnections between countries to cope with higher shares of variable renewable energy and other zero-carbon sources of electricity. Similarly, changes are likely to occur not only within sectors but also between sectors – for example, due to an increased electrification of the transport and buildings sectors.

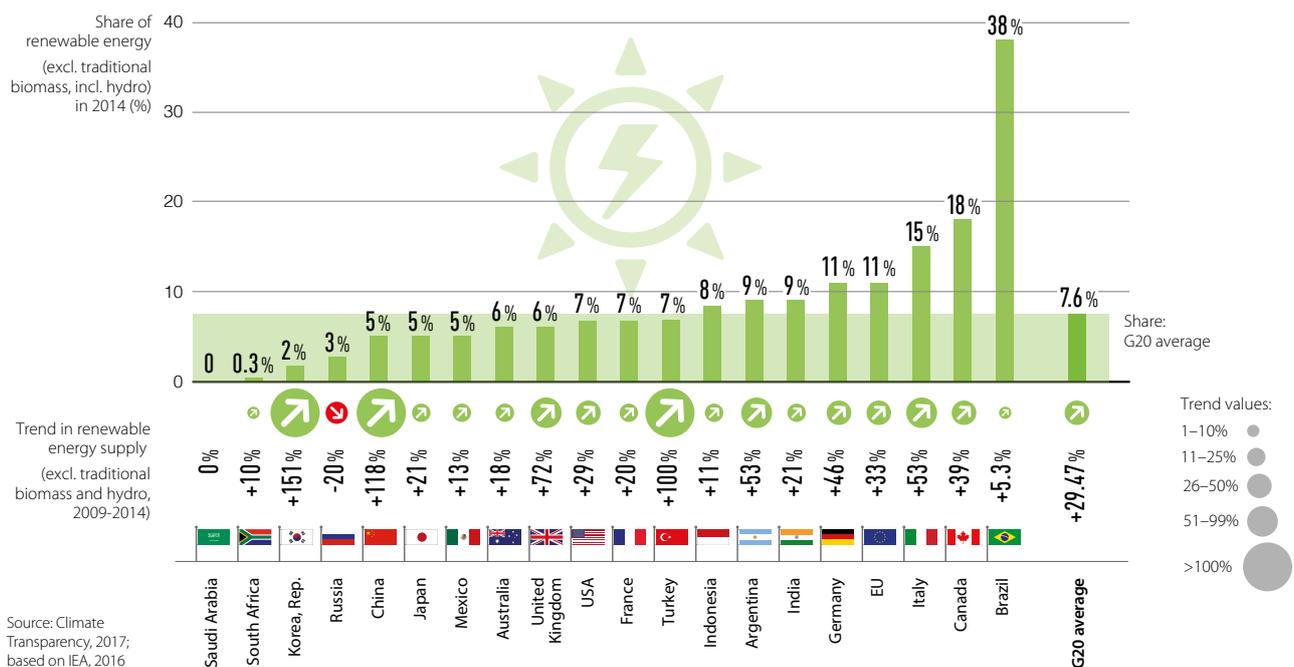
The renewable energy agenda of this year’s Energy Transitions Working Group builds upon the 2015 G20 Toolkit of Voluntary Options on Renewable Energy Deployment, the 2016 G20 Voluntary Action Plan on Renewable Energy and the 2017 recommendations of the G20 Hamburg Climate and Energy Plan for Growth.

There will be special attention paid to the difficulties faced by developing countries to access financing and to design risk mitigation guarantee schemes that allow for long-term infrastructure development.

The Energy Transitions Working Group can advance climate action through the following steps:

- Commit to align energy scenarios with the long-term low-carbon development strategies in order to secure a progressive decarbonisation of the energy sector, with the goal of decarbonising by around mid-century.
- Define in 2018 which low emission options and technologies are consistent with its long-term strategy to 2050, including identifying timelines for new and existing assets to be deployed and/or phased out as recommended by the OECD.⁹
- Make recommendations on how to increase ambition with regards to renewable energy supply, both within the G20 and in other countries by further implementing the G20 renewable energy initiatives.
- Support the decarbonisation of sectors by establishing institutionalised exchanges within the G20 to define strategies for sector coupling.

Figure IV: Share and trend of renewables in total primary energy supply (2009-2014)



9 (OECD, 2017: 114)

2.3 Phasing out fossil fuel subsidies and expanding carbon pricing

According to information from the OECD and the IEA, G20 countries provided more than US\$ 230 billion in subsidies to coal, oil and gas in 2014.^{10,11} Saudi Arabia provided the largest amount at more than US\$ 71 billion. China provided almost US\$ 35 billion, Indonesia US\$ 32 billion, and Brazil US\$ 27 billion. Canada and Turkey provided the least, at US\$ 114 million and US\$ 912 million, respectively (Climate Transparency, 2017 based on OECD, 2015). These fossil fuel subsidies also act as negative carbon prices.

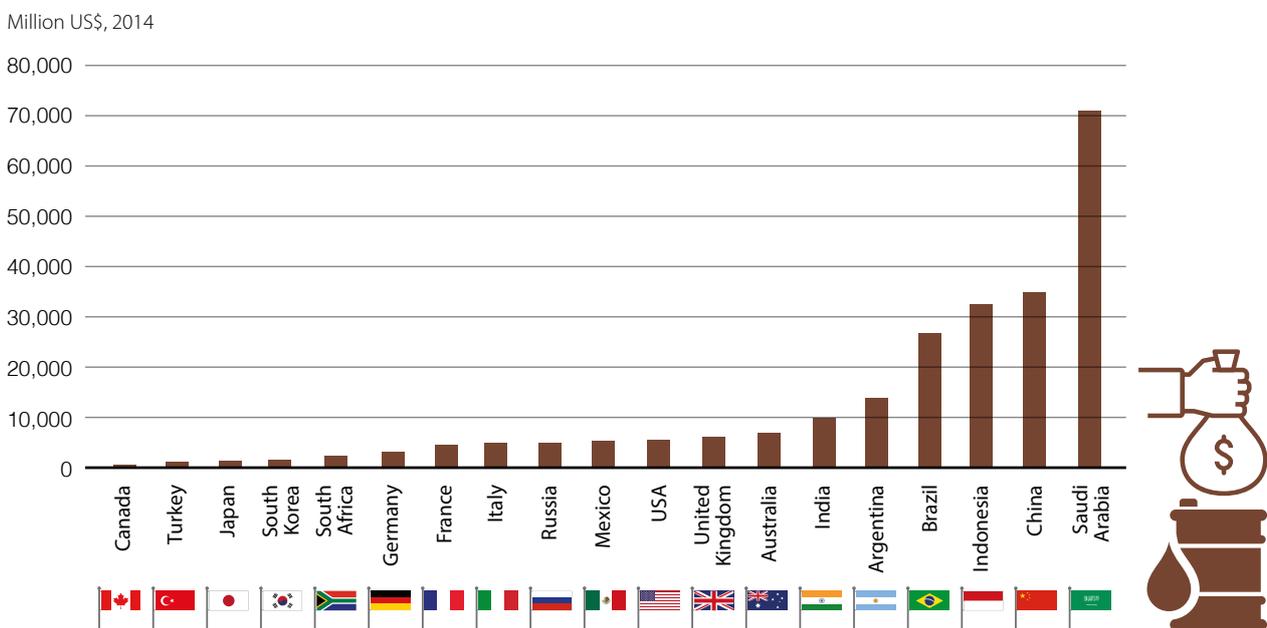
Several G20 countries have implemented carbon pricing schemes such as Emission Trading Systems (ETS), carbon taxes and taxes on fossil fuels. However, only 13% of global emissions are subject to carbon pricing and the price levels are often low (World Bank Group, 2017). This incentive structure – high fossil fuel subsidies and low carbon prices – favours high-carbon investments.

Phasing out fossil fuel subsidies and ensuring effective carbon pricing creates additional fiscal space for sustainable development. To prevent regressive distributional effects, poor households affected by energy price reform should be protected, including through compensation (Nguyen et al., 2017).

Since 2009, the G20 has committed every year to phasing out fossil fuel subsidies in the medium term. Under the German G20 Presidency it was suggested to follow the G7's pledge on phasing out fossil fuel subsidies by 2025, however, a consensus on this was not reached. In the CEAP, 19 countries state that “we will endeavor to make further progress in moving forward this commitment” (G20, 2017: 12). It also encourages all G20 members to initiate a voluntary peer review as soon as feasible. Fossil fuel peer reviews have already been conducted by the US–China, Mexico–Germany and Indonesia–Italy (due 2018) (OECD, 2018).

The CEAP also encourages G20 countries to “initiate sharing good practices and experiences on domestic mitigation and adaptation policies, including domestic economic and market-based instruments as well as emission to value approaches” (G20, 2017: 11). This can be read as the beginning of a G20 process for mutual dialogue on carbon pricing.

Figure V: **G20 Fossil fuel subsidies**



Source: Climate Transparency, 2017; Calculations done by ODI based on OECD and IEA 2017 data

10 This estimate only includes tax exemptions and budgetary support towards production and consumption of fossil fuels, and does not consider broader subsidies provided through public finance and state-owned companies.

11 The data on fossil fuel subsidies is drawn from the OECD's fossil fuel inventory 2015. Data on Argentina and Saudi Arabia, not included in the OECD database, is taken from the IEA subsidies database. The IEA uses a different methodology for calculating subsidies than the OECD. It uses a 'price-gap' approach and covers a sub-set of consumer subsidies.

Table III: **Examples of G20 countries – fossil fuel subsidies reform and carbon pricing**

 Canada	Carbon pricing scheme: In 2016, the Canadian government required all provinces and territories to have a carbon pricing initiative in place in 2018, according to federal criteria. British Columbia, Alberta and Ontario have all implemented carbon taxes and emission trading schemes (some in addition to pre-existing carbon taxes), while a further three (of ten) provinces and territories have carbon pricing regimes scheduled for implementation.
 China	Carbon pricing scheme: China launched a nationwide carbon-trading scheme for the power sector in December 2017. It will initially cover about 1,700 coal and natural gas-based power-generating companies, accounting for more than a third of China's CO ₂ emissions. The scheme is expected to expand to other sectors.
 India	Subsidies reform: India ended diesel price regulation in 2014, providing a good example of the effectiveness of phased price increases in limiting political opposition and economic disruption.
 Indonesia	Subsidies reform: Indonesia eliminated a large amount of diesel and gasoline subsidies in 2014, reallocating subsequent savings (also from lower world oil prices) of US\$ 15.6 billion to investments in people and infrastructure.

The Energy Transitions Working Group can advance climate action through the following steps.

- Agree on an end-date for fossil fuel subsidies (to production and consumption).
- Commit to undertake all peer reviews on fossil fuel subsidies (the G20 countries that have not done so to date) prior to 2020, starting with Argentina to lead by example as G20 President.
- Share knowledge on how subsidy reforms can be used for wider sustainable development objectives (health, education, green infrastructure etc.) including through re-directing the savings towards groups most affected, and to ensure a just transition.
- Establish a cooperation platform on carbon pricing to: a) initiate a peer review process assessing the adequacy of current carbon pricing systems in line with the NDCs under the Paris Agreement; and b) encourage the sharing of best practices for the use of revenues from carbon pricing for sustainable development.

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Authors

This report was prepared by Enrique Maurtua Konstantinidis, Jazmín Rocco Predassi and Hannah Schindler.

Contact: Enrique Maurtua Konstantinidis (enriquemk@farn.org.ar)

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info@climate-transparency.org



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