



HUMBOLDT-VIADRINA
Governance Platform



Climate
Transparency



12 INSIGHTS TO MOVE

BEYOND COAL



TOWARDS
NET-ZERO



1

COAL PHASE-OUT IS KEY TO ACHIEVING THE PARIS AGREEMENT

2015

The 2015 Paris Agreement sets a clear goal to keep the global temperature rise to well below 2°C, pursuing efforts to limit it to 1.5°C. To meet this goal, carbon emissions must be reduced to net-zero by 2050.

Coal is the most carbon-intensive fossil fuel used in power generation. Nearly a third of global energy-related CO₂ emissions come from the coal sector.¹ To limit warming to 1.5°C, coal power should have peaked in 2020. Now, it is critical to completely phase out coal by 2030 in the EU/OECD, by 2037 in non-OECD Asia, and by 2040 in the rest of the world.²

Climate change is not the only driver. Alternatives to coal, oil and gas are becoming cheaper. Renewables are cleaner, improve air quality and help create new jobs. As a result, coal is no longer considered a secure investment.

Countries urgently need to deliver plans for the global and local phase-out of coal, and to facilitate a just transition. Oil and gas will have to follow coal in the coming decades, so using them as transition fuels creates a high risk of stranded assets.

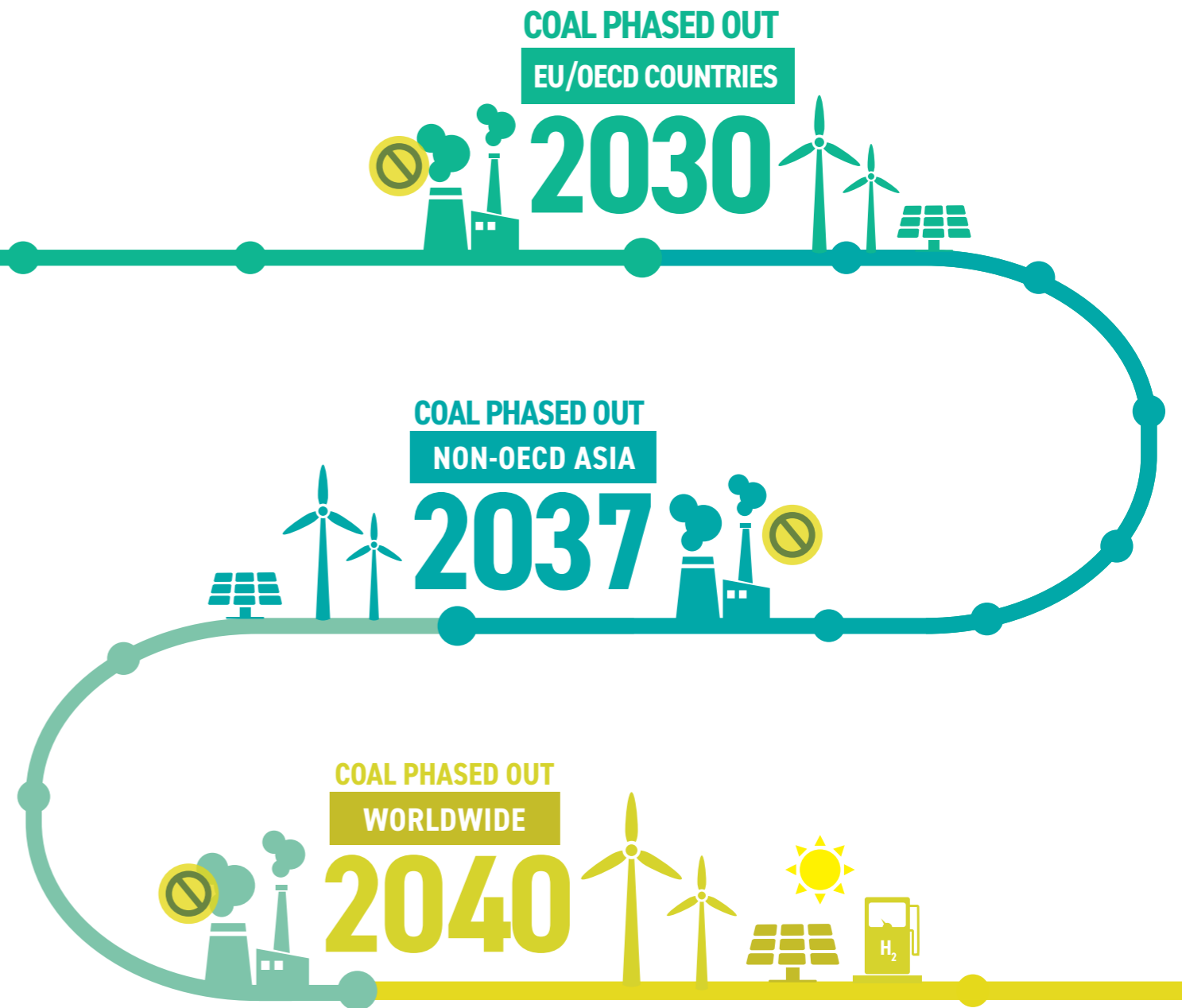


António Guterres 

Secretary-General of the United Nations

 “Stop building new coal plants by 2020.

We need a green economy not a grey economy.”



2

RENEWABLES + STORAGE CAN REPLACE COAL AT LOWER COSTS

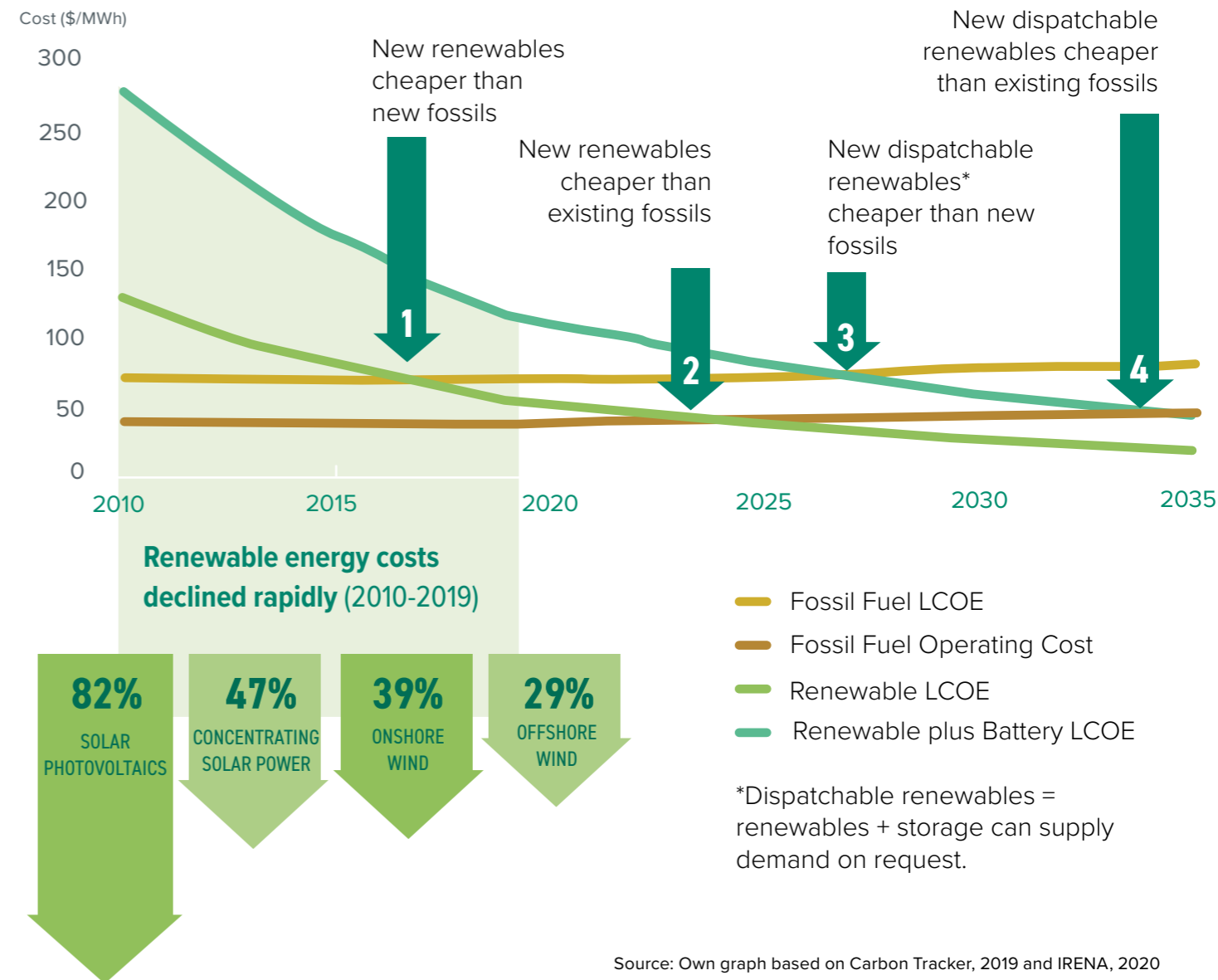
Renewable energy costs have plummeted over the past 10 years due to improvements in product design, manufacturing efficiency and capacity, economies of scale, and policies such as tax credits, feed-in tariffs, and renewable portfolio standards. As a result, the levelised cost of energy (LCOE) of new renewables has become cost-competitive with, and sometimes cheaper than, traditional fossil fuel power sources globally and across most regions.

In 2019, more than half of utility scale renewable capacity additions achieved power costs lower than the cheapest new coal plant. Competitive auctions for new capacity continue to result in record-breaking renewable bids beating fossil fuel prices.³

The decline in renewable and storage* prices is expected to continue.⁴ Improved digitalisation and energy efficiency are helping to address the intermittency of renewables and modernise the energy system. To ensure a just transition, countries should stay ahead of the curve and manage the risks of stranded assets (e.g. coal power plants to the value of USD 600 bn risk becoming stranded globally⁵), fiscal instability, and job losses.

*In gas-importing regions, like Europe, China and Japan, for example, the cheapest new-build peaking technology is battery storage.⁶

Cost tipping points: Renewables increasingly displace fossils



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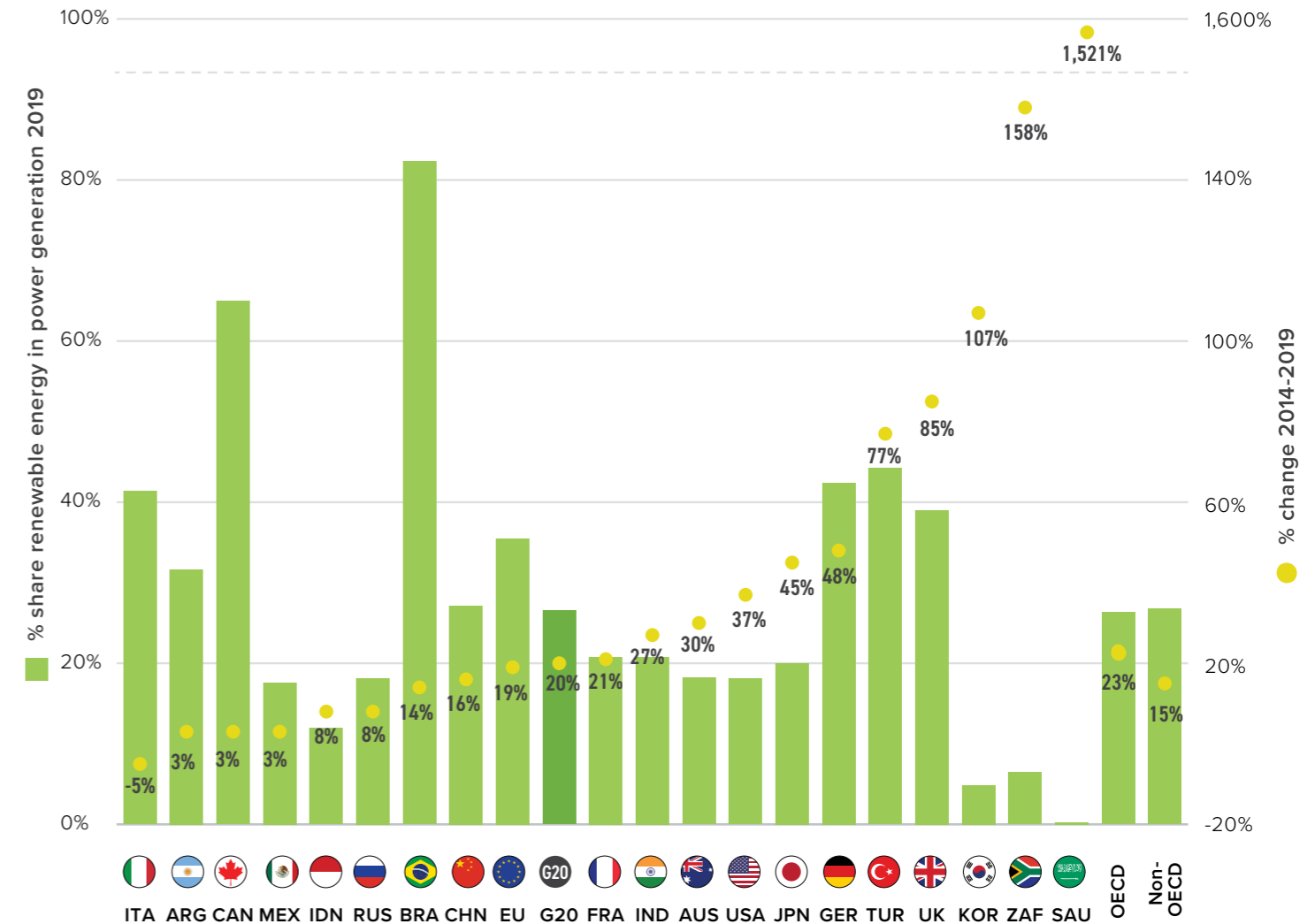
RENEWABLES ARE ALREADY APPROACHING 30% OF POWER GENERATION IN THE G20

In 2019, low-carbon power generation – including nuclear, hydro, wind, solar, biomass and geothermal – matched global coal power for the first time.⁷ Renewables alone accounted for almost 27% of gross power generation in the G20 in 2019, compared to 22% in 2014 and 19% in 2010.⁸ This growth has primarily been driven by new wind and solar installations.

The share of renewables in power generation increased in 19 of the G20 countries in 2019 and is projected to increase in all 20 countries in 2020, contributing 28% of power generation overall. This progression demonstrates the resilience, particularly in times of the Covid-19 crisis, and potential of the industry. It is a clear sign of climate policies and economic factors at work in G20 countries.

Policies to increase renewable electricity generation exist in 16 of the G20 members. Even in Australia, Canada, Mexico and the USA, which have no or very weak national policies, the share of renewables in electricity generation is increasing due to market forces and the commitment of citizens, regions and industry. Given the net-zero emissions announcements and updated 2030 climate targets, higher renewable energy targets and stronger policies are likely to emerge.

Share of renewables (incl. large hydro) in power generation in the G20 (2019)



Source: Climate Transparency, 2020 based on Enerdata, 2020

4

LEADING GOVERNMENTS AND FINANCIAL INSTITUTIONS ARE PLANNING FOR A COAL PHASE-OUT

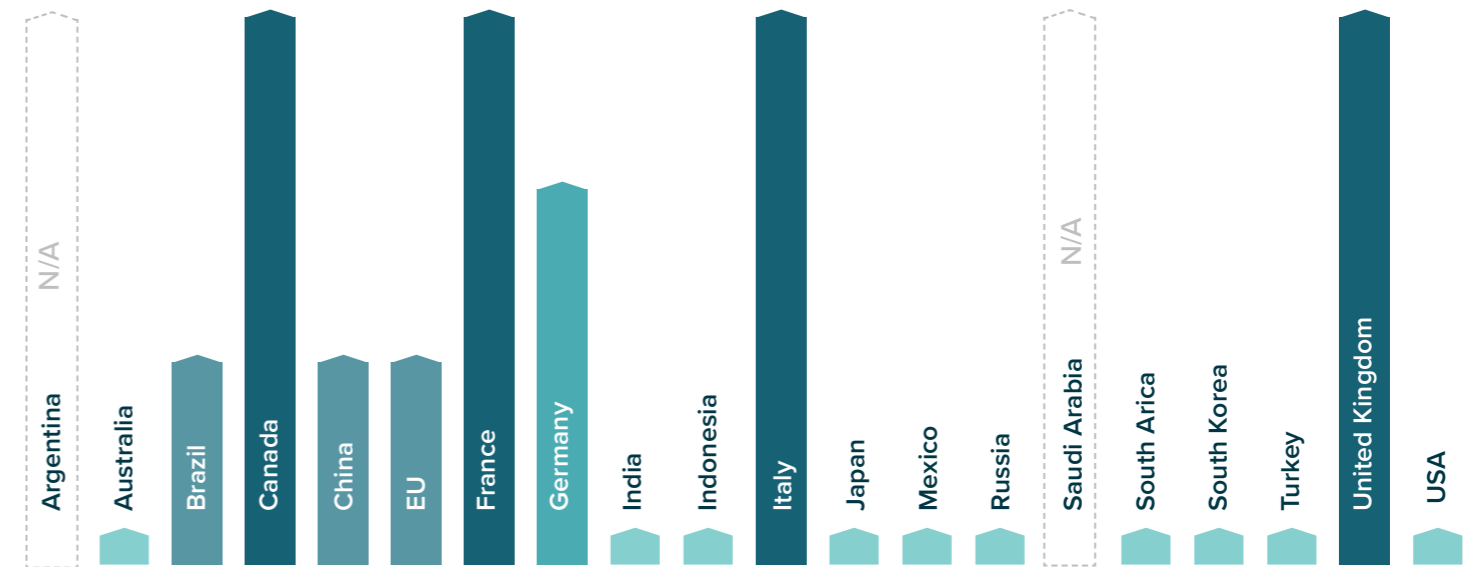
Through retirement commitments and phase-out policies, 36% of the OECD’s total coal capacity has been scheduled to close by 2030.⁹ This shift has been supported by the Powering Past Coal Alliance (PPCA), which comprises 34 countries, 35 sub-national governments and 44 organisations.

In the G20, Canada, France, Italy and the UK have set 1.5°C compatible coal phase-out targets (by 2030 or earlier), Germany follows with a phase-out date of 2038.* To reach the new EU climate target (announced in 2020) all EU countries must phase out coal by 2030.¹⁰ A number of coal-reliant countries without existing coal phase-out plans, including Japan, South Korea, South Africa, and China, recently made net-zero emissions by mid-century commitments. This has refocused national debates on how to manage the coal phase-out and a just transition.

In addition, over 130 financial institutions created or strengthened their policies to divest from, ban, or restrict the financing of thermal coal power and, partly, mining. This includes top global banks, some of the biggest global insurers, public development finance institutions, export credit agencies and MDBs.¹¹ In addition, companies including General Electric, Mitsubishi, Siemens, Samsung and Toshiba have announced that they will stop building new coal plants.

*Many of these countries are replacing coal power with gas, calling into question the 1.5°C compatibility of their coal phase-out strategies.

G20 coal phase-out policy rating



Source: Climate Transparency, 2020

- Low**
No target or policy in place for reducing coal
- Medium**
Some policies in place for reducing coal
- High**
Policies + coal phase-out decided
- Front-runner**
Policies + coal phase-out date before 2030 (OECD and EU28) or 2040 (rest of the world)



Yoshihide Suga
Prime Minister, Japan

Japan’s pledge to reduce emissions to net-zero by 2050 “will radically change the policy for coal-fired power”.

October 2020



Moon Jae-in
President, South Korea

“By replacing coal power generation with renewable energy, we will create new markets and industries and create jobs”.

October 2020

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COAL POWER IS DECLINING GLOBALLY AS INVESTORS WAKE UP TO FINANCIAL RISKS

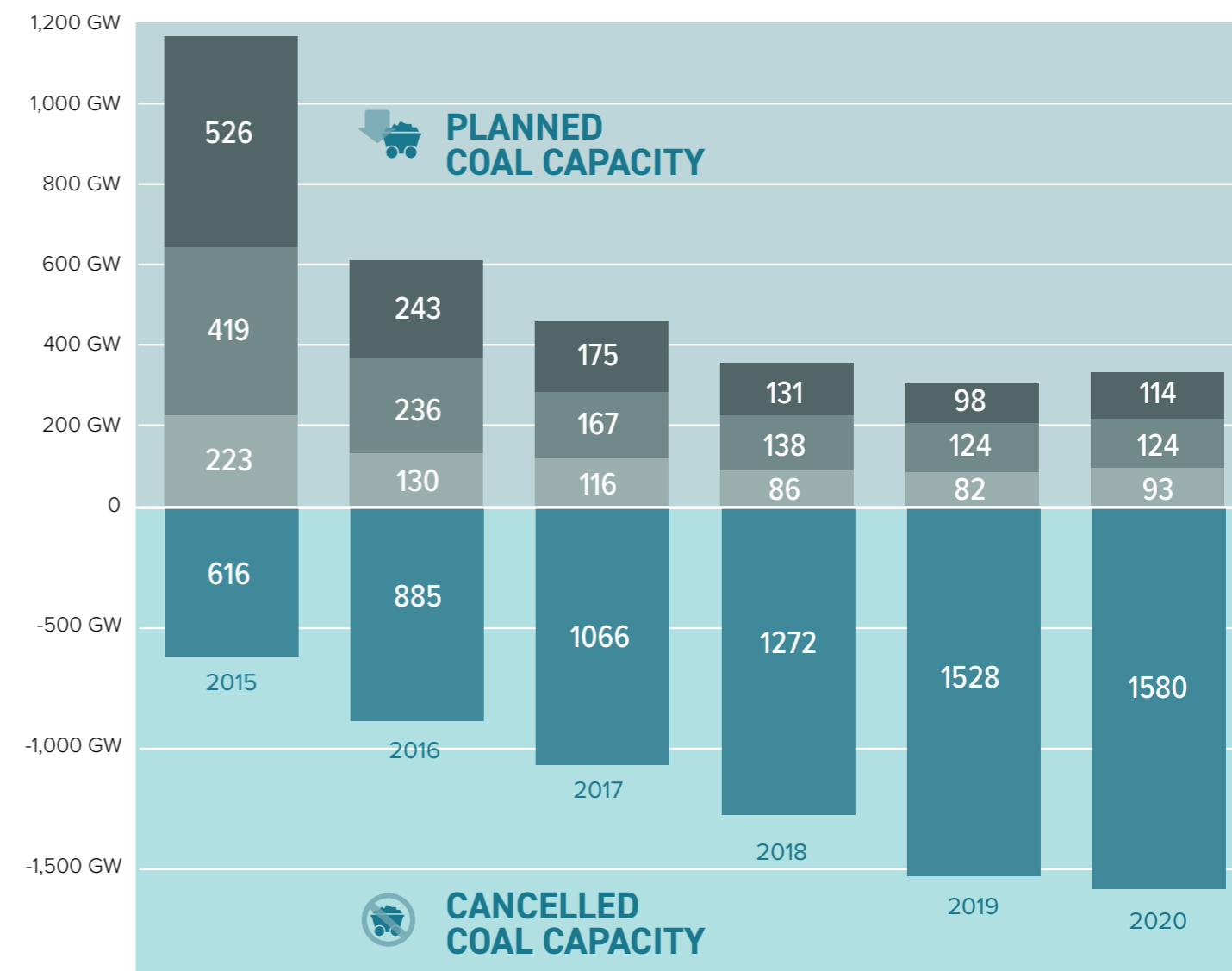
Coal power is becoming more difficult and expensive to finance – a trend that will continue as carbon pricing takes effect alongside shifting economics, air pollution legislation and enforcement, and coal phase-out policies in key countries. As coal power moratoria are put in place, upstream coal supply and trade disruptions can be expected.

The effect of these trends is already evident: Between 2015 and 2020, cancelled coal capacity additions more than doubled while the project pipeline of additional capacity has shrunk by almost 75%.¹² The slight increase in permitted capacity additions in 2020 is most likely a consequence of government support to coal as part of Covid-19 responses, including at least 40.8 GW on new coal approvals in China.

Global coal power generation decreased by around 3% in 2019. This constituted the first drop after three years of growth.¹³ The decline was due to decreased demand from the power sector, with significant coal power decreases in the EU (26%) and the US (14%) due to structural shifts in the power market, driven by economic factors and, in the case of the EU, policy.¹⁴

Due to the Covid-19 crises and reduced energy demand, global coal demand is expected to have fallen by about 7% in 2020. This would constitute the largest drop since World War II, with coal use declining in every region worldwide.¹⁵

Global planned and cancelled coal capacity, 2015-2020 (GW)



● Announced ● Pre-Permit ● Permitted ● Cancelled (since 2010)

Source: Global Coal Plant Tracker, 2020

Note: Data only includes information for the first half of 2020 based on the Global Coal Plant Tracker July 2020 update.

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DESPITE CLIMATE AND FINANCIAL RISKS, SOME G20 COUNTRIES CONTINUE TO ADD COAL POWER CAPACITY

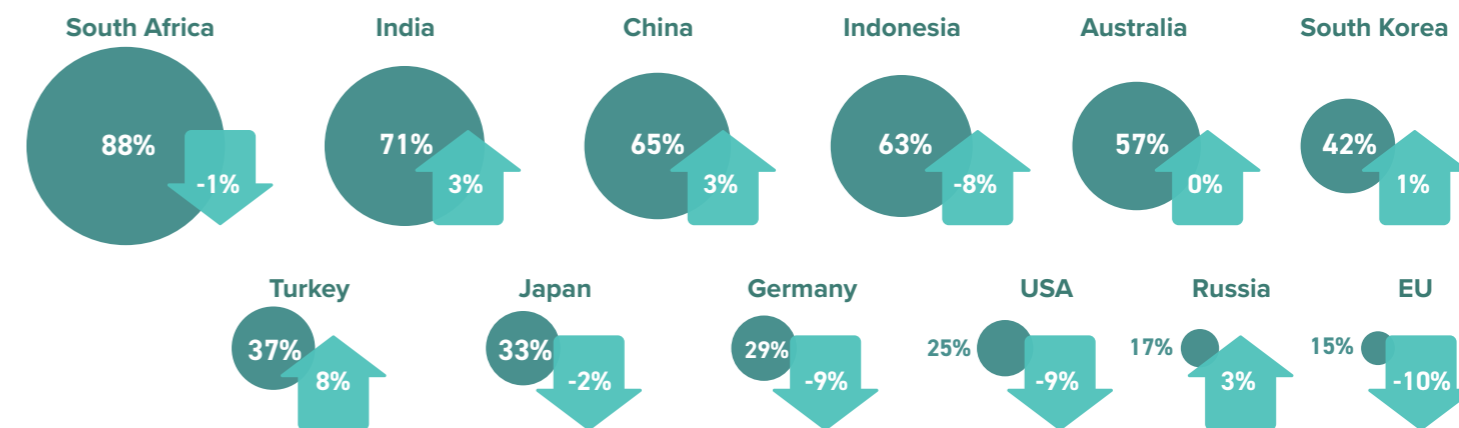
The G20 is responsible for 85% of global coal consumption. G20 countries are home to the biggest coal fleets worldwide, and 40% of the power generated across the G20 still comes from coal.¹⁶

China accounts for half of global coal consumption and around 50% of global coal power capacity.¹⁷ Despite overcapacity and low utilisation rates (load factor of 49% in 2019¹⁸), China continues to build more coal plants. In 2020, China eased restrictions for future domestic coal plant construction and approved an additional 40.8 GW.

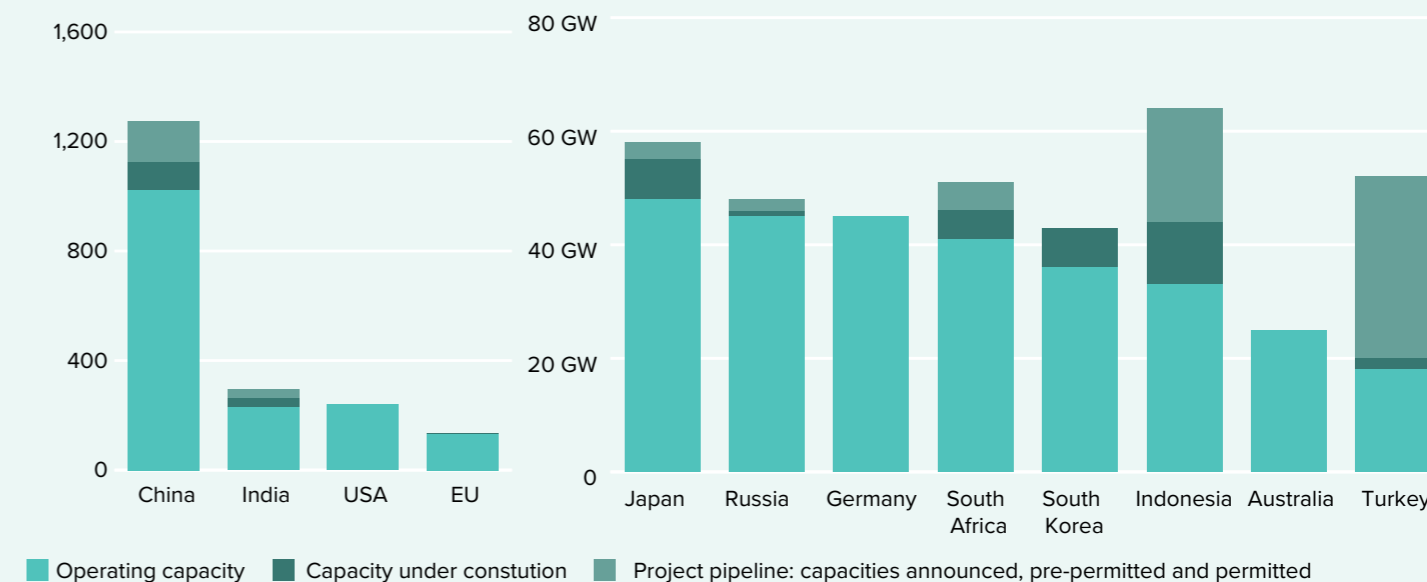
India, Indonesia, Japan, South Africa, South Korea, and Turkey as well as the EU countries, Greece and Poland, are also currently constructing new plants. Turkey has the highest planned capacity worldwide in comparison to the country's existing capacity. It is, however, likely that planned capacity will not be built due to financial, economic and political trends.

Building new coal power plants, even where they may replace less efficient plants, risks locking countries into costly carbon-intensive futures with negative economic implications and environmental externalities.

Share of coal in power generation (2019) and 5-year trend (2014-2019) for top G20 countries



Current and planned coal capacity for top G20 countries



Source: Enerdata, 2020; Global Coal Plant Tracker, July 2020.

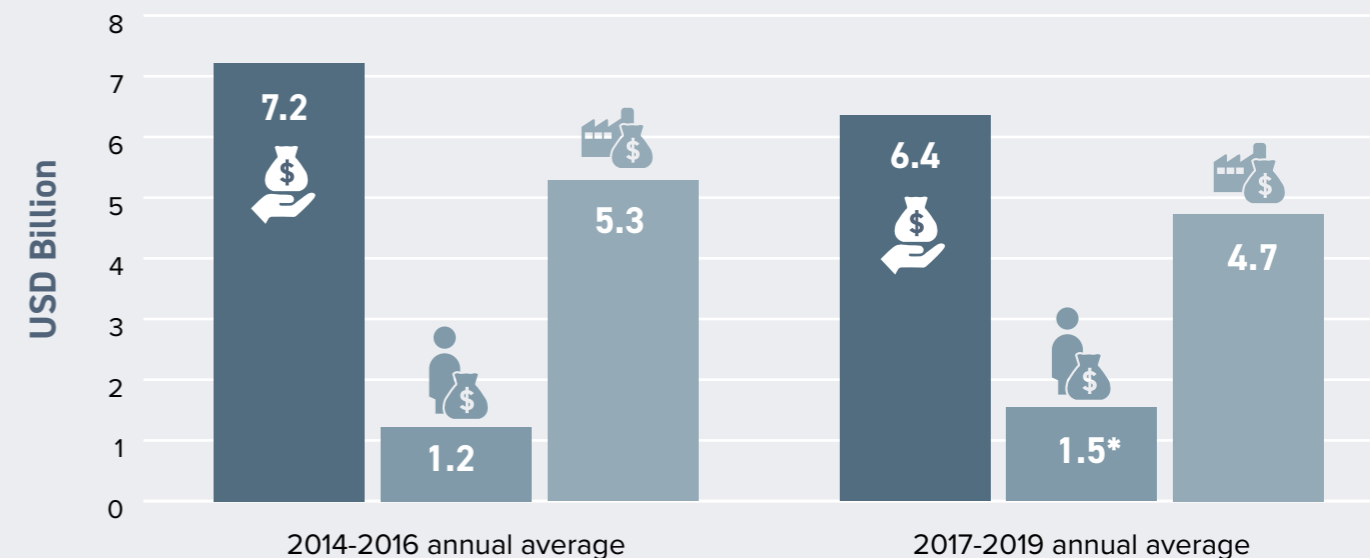
7

SOME G20 COUNTRIES CONTINUE TO DIRECT PUBLIC RESOURCES TO COAL AT HOME AND ABROAD

G20 governments spent USD 12.63 bn on coal production on average annually between 2017-2019.¹⁹ This includes fiscal support, public finance, and state-owned enterprise (SOE) investment in coal exploration, production (mining), processing and transportation, in addition to coal power generation. The amount would be even higher if support for coal consumption by industry, transport, households, and other consumers was included.

On average, annual G20 government support decreased slightly by USD 1.09 bn in 2017-2019, compared to 2014-2016. Nevertheless, the reduction of public support to coal needs to be accelerated to meet national and global net-zero goals in line with the Paris Agreement. Continued funding is artificially extending the life of the coal industry, to the detriment of climate and sustainable development goals.

G20 public support to coal production (domestic and overseas)



FISCAL SUPPORT

Provision of budgetary transfers (e.g. subsidies to coal production) and foregone revenue through tax breaks

Objective: Setting price signals to influence consumer behaviour

PUBLIC FINANCE

Provision of grants, equity, loans, guarantees and insurance by bilateral public finance institutions controlled by governments, including export credit agencies, national development banks and development finance institutions (excl. multilateral development banks)

Objective: Driving private investment by de-risking finance

SOE INVESTMENT

Investment of state-owned enterprises in coal and coal-fired power production

Objective: Providing infrastructure, goods and services, often below market value

*2017-2018 annual average

Note: G20 fiscal support data excludes Saudi Arabia, and for Turkey and the UK it only includes 2017 data.

Sources: OECD-IEA Fossil Fuel Support database, 2020; Oil Change International Shift the Subsidies database, 2020; ODI, 2020

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ECAS IN JAPAN, CHINA AND KOREA ACCOUNT FOR 94% OF G20 ECA COAL SUPPORT, BUT INCREASINGLY FACE RESTRICTIONS

Export credit agencies (ECAs) in G20 countries provide public financial backing for risky projects overseas, to support their national industry.

Despite the 2015 OECD Agreement restricting ECA coal power finance,* several G20 countries have continued to support coal projects. Between 2016 and 2018, G20 countries provided at least USD 7.1 bn annually to coal projects** 20 through ECAs, an increase from USD 5.7 bn between 2013 and 2015. By comparison, G20 ECA support for renewables between 2016 and 2018 was only USD 2.7 bn annually.

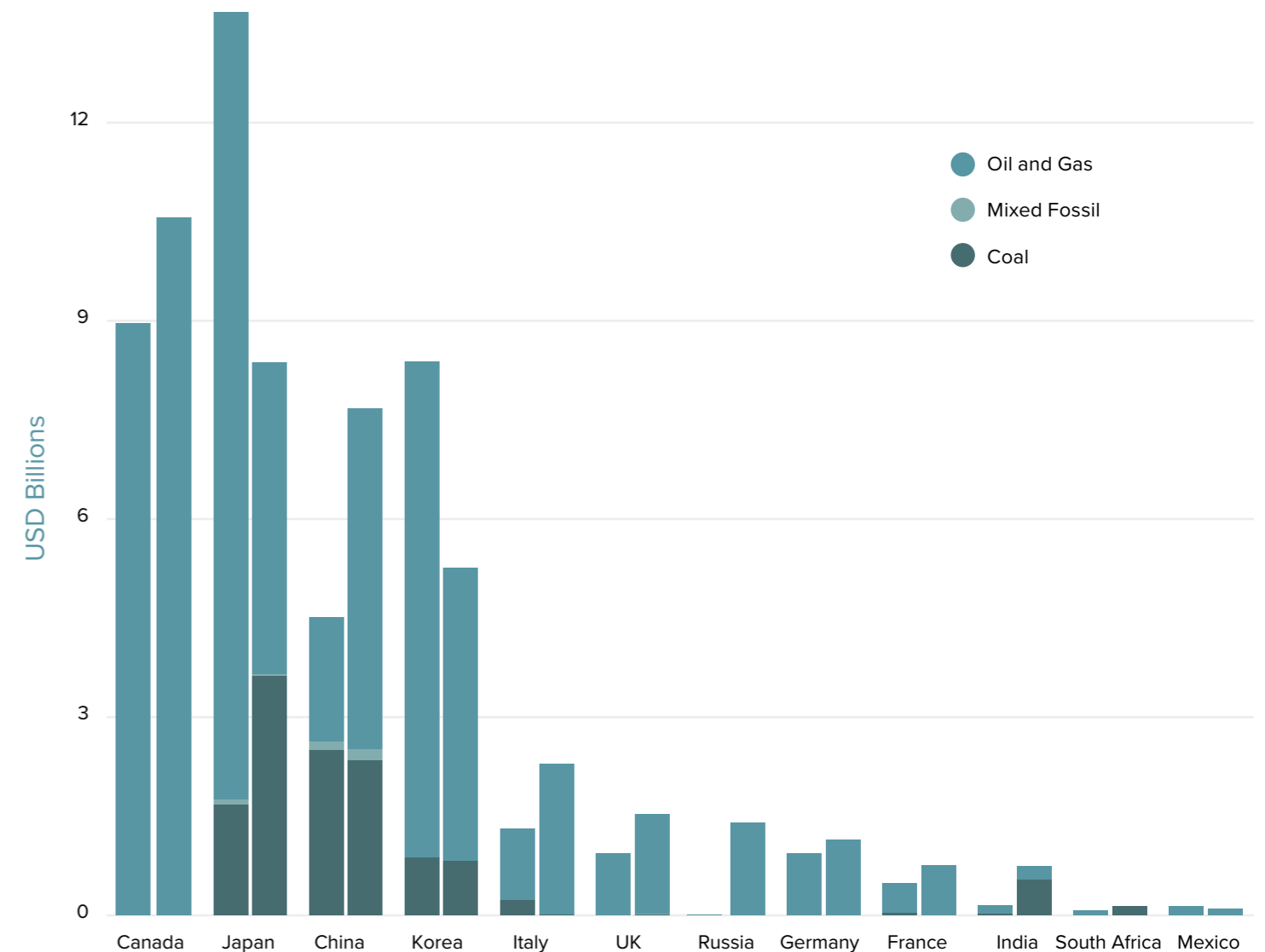
Japan, China, and South Korea account for the highest levels of G20 ECA coal support, providing USD 3.6 bn, 2.3 bn, and 0.8 bn, respectively. A decrease in support is expected, given that all three countries recently set mid-century net-zero emissions targets. Japan and South Korea also announced restrictions for ECA coal finance in 2020. 21

A review of the OECD Agreement was due in 2020, and discussions are on-going. To reflect the Paris Agreement, this review should 1) tighten restrictions to exclude investments for all new coal power plants and modernisation of existing plants unless combined with a Paris compatible decommissioning date, and 2) expand restrictions to cover all aspects of the coal supply-chain as well as the full range of financial products ECAs offer.

*Formally called the Coal-Fired Electricity Generation Sector Understanding (CFSU)

**Due to a lack of transparency, these finance figures are likely to be significant underestimates.

ECA fossil fuel finance for top G20 countries, annual average 2013-2015 and 2016-2018



Source: Oil Change International Shift the Subsidies Database, 2020

9

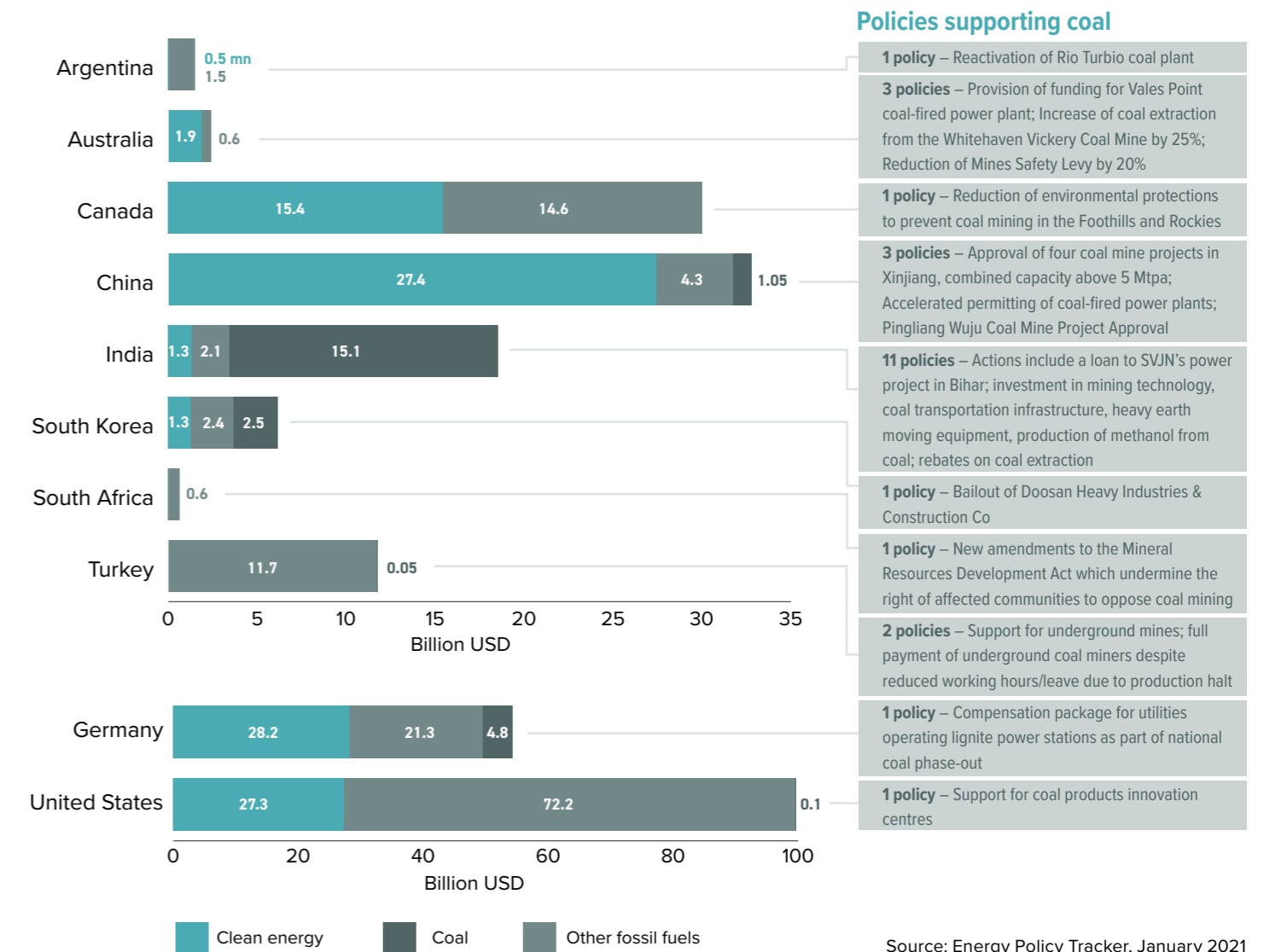
MOST G20 COVID-19 RECOVERY PACKAGES INVEST IN THE PAST: SUPPORTING THE COAL AND OTHER FOSSIL FUEL SECTORS

Green Covid-19 recovery programmes could be used to advance the transition to low-carbon economies and societies. To date, this opportunity has been missed or underutilised by G20 countries, with 52% of total G20 stimulus support in the energy sector being directed towards fossil fuels compared to 38% towards clean energy.²²

Ten G20 countries are directing stimulus support to the domestic coal sector, with a total of USD 23.6 bn (10% of stimulus support to fossil fuels). Financial support to the coal sector has been particular high in China, India, and South Korea. During the Covid-19 crisis, Germany confirmed compensation payments for two major utilities that will shut down eight lignite power plants in accordance with the country's coal phase-out plan.

Instead of extending the life of coal, governments could green their Covid-19 recovery packages to protect workers, communities, and the climate. Adding conditionalities to bailouts, investing in sustainable infrastructure as well as education, research, and development, and reinforcing climate-friendly policies are a first step. Industrialised countries also need to support developing countries in recovering from the crisis.

G20 countries supporting the coal sector as part of their Covid-19 recovery packages



Notes: Some countries had already allocated expenditure to the coal sector prior to Covid-19, e.g. Germany. Many policies supporting coal as part of the G20 countries' responses to Covid-19 remain unquantified.

SOME G20 COVID-19 RECOVERY PACKAGES INVEST IN THE FUTURE: MODERNISING ENERGY SYSTEMS AND PROMOTING GREEN HYDROGEN

Of the G20 members, 18 have included some support for green measures in their recovery plans, including important investments for low-carbon solutions in the transport and power sector.

In the future, energy systems will need to be more resilient, efficient, digital, and sustainable. This will require new approaches to managing power demand, grid flexibility and meeting energy end-use needs.

Green hydrogen is a promising means for converting renewable energy into fuel that can be used for power generation at any time, in industry, heating and transport.

In 2020, the European Union, France and Germany launched hydrogen strategies with a focus on green hydrogen and dedicated a proportion of recovery expenditure to the development of green hydrogen production and markets at home and abroad.

Other G20 countries, including Japan (2017), South Korea (2019), and Australia (2019), also have hydrogen strategies in place, though the focus is not yet exclusively on green hydrogen. Nevertheless, the development of hydrogen infrastructure and markets can be used as a basis for further development of green hydrogen in these and other countries.²³

Hydrogen strategies of G20 countries

Japan: Basic Hydrogen Strategy (December 2017)

Green Growth Strategy (December 2020)



Target (consumption volume): Up to 3 million tonnes of hydrogen a year and price reduction to USD 3/kg by 2030



Plans to become a “hydrogen society” using hydrogen for power generation, transportation and industry

South Korea: Hydrogen Economy Roadmap (January 2019)



Target (end use): 15 GW fuel cell for power generation by 2040 + 6.2 million fuel cell electric vehicles, 1,200 fuelling stations, 60,000 hydrogen busses

Australia: National Hydrogen Strategy (November 2019)



Target: to become world's third largest hydrogen exporter by 2030



Emphasis on “clean” (CCS) not “green hydrogen”

Germany: National Hydrogen Strategy for Germany (June 2020)



Target (production capacity): 5 GW generation facilities by 2030 (plus imports)



Aim to **decarbonise hydrogen** production and plan to construct required renewable generation supply



Plans for hydrogen **development in partner countries**, such as Morocco

EU: Hydrogen Strategy for a Climate-neutral Europe (July 2020)



40 GW

Target (production capacity): 40 GW EU electrolyser capacity for green hydrogen by 2030



Aim to **decarbonise hydrogen** production

France: National Hydrogen Strategy (September 2020)



6.5 GW

Target (production capacity): 6.5 GW of capacity from non-fossil resources by 2030



Aim to **decarbonise hydrogen** production



Aim to create 50,000 to 150,000 **direct and indirect jobs**

11

GREEN HYDROGEN IS A PROMISING NET-ZERO INDUSTRY WHERE G20 COUNTRIES CAN TAKE THE LEAD

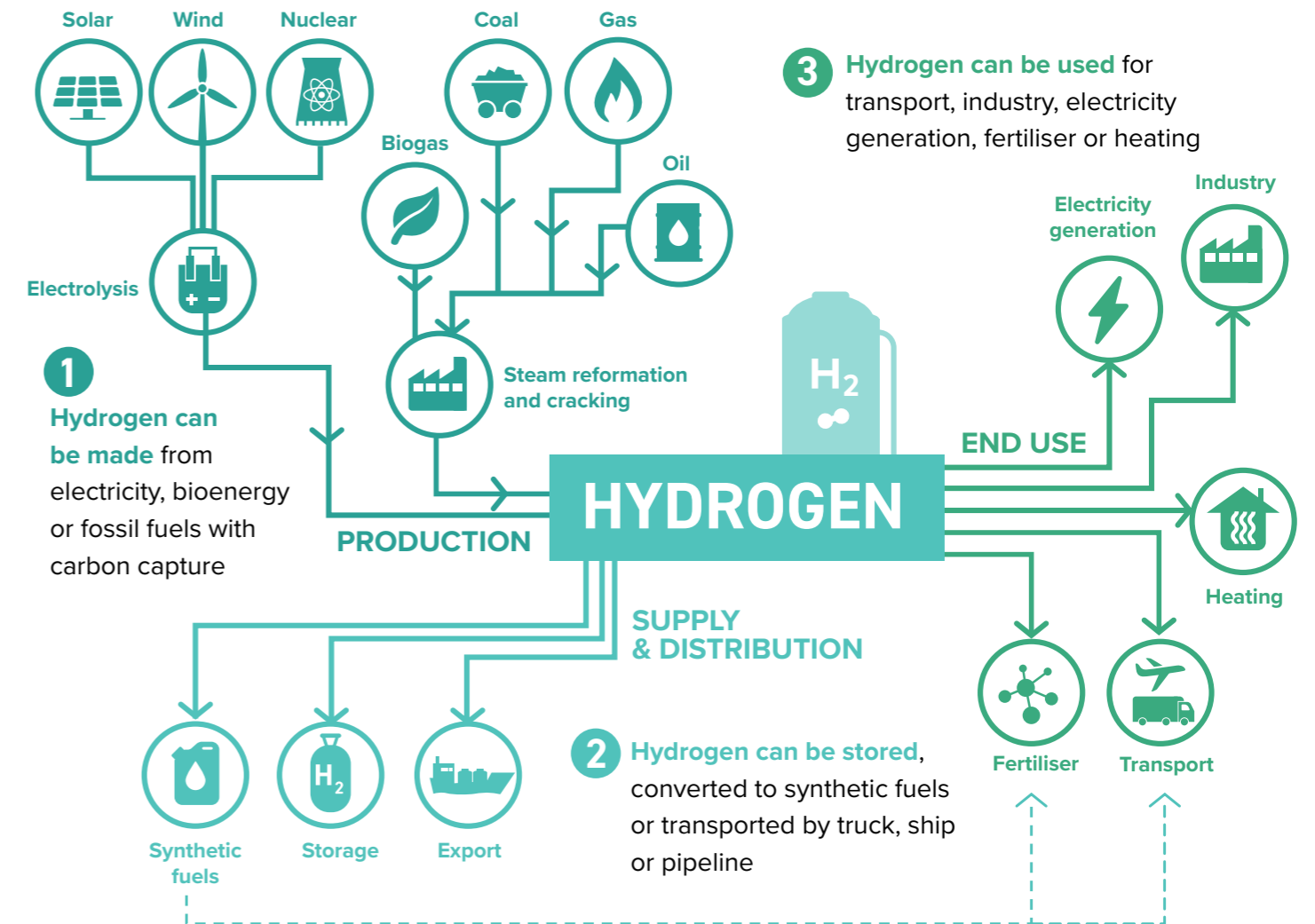
Green hydrogen can play a critical role in moving to net-zero, especially in hard to abate sectors such as industry (steel or chemicals) and transport, and also by providing a zero-emission alternative to natural gas. Indeed, many see the potential for a 'hydrogen economy' being the main hub of the future energy system.

Like the fossil fuel driven development before it, for hydrogen to become affordable it is imperative that hydrogen infrastructure is developed (and fast) to realise economies of scale. Innovation will also be required, to improve production and storage options. International coordination will make this process less risky and costs will be distributed. Leading economies in the G20 have a critical role to play, and the recent wave of hydrogen policies signals that many are stepping up to the challenge.

Hydrogen can be made with any power source, captured as a by-product from certain industry, and also occurs naturally. Colours are used to differentiate power source, process, and whether carbon capture and storage (CCS) are used in production. Green hydrogen (produced with renewable energy) is the most promising option for transitioning to net-zero, followed by blue hydrogen (produced with gas, using CCS).

The hydrogen economy

How low-carbon hydrogen could be made, moved and used



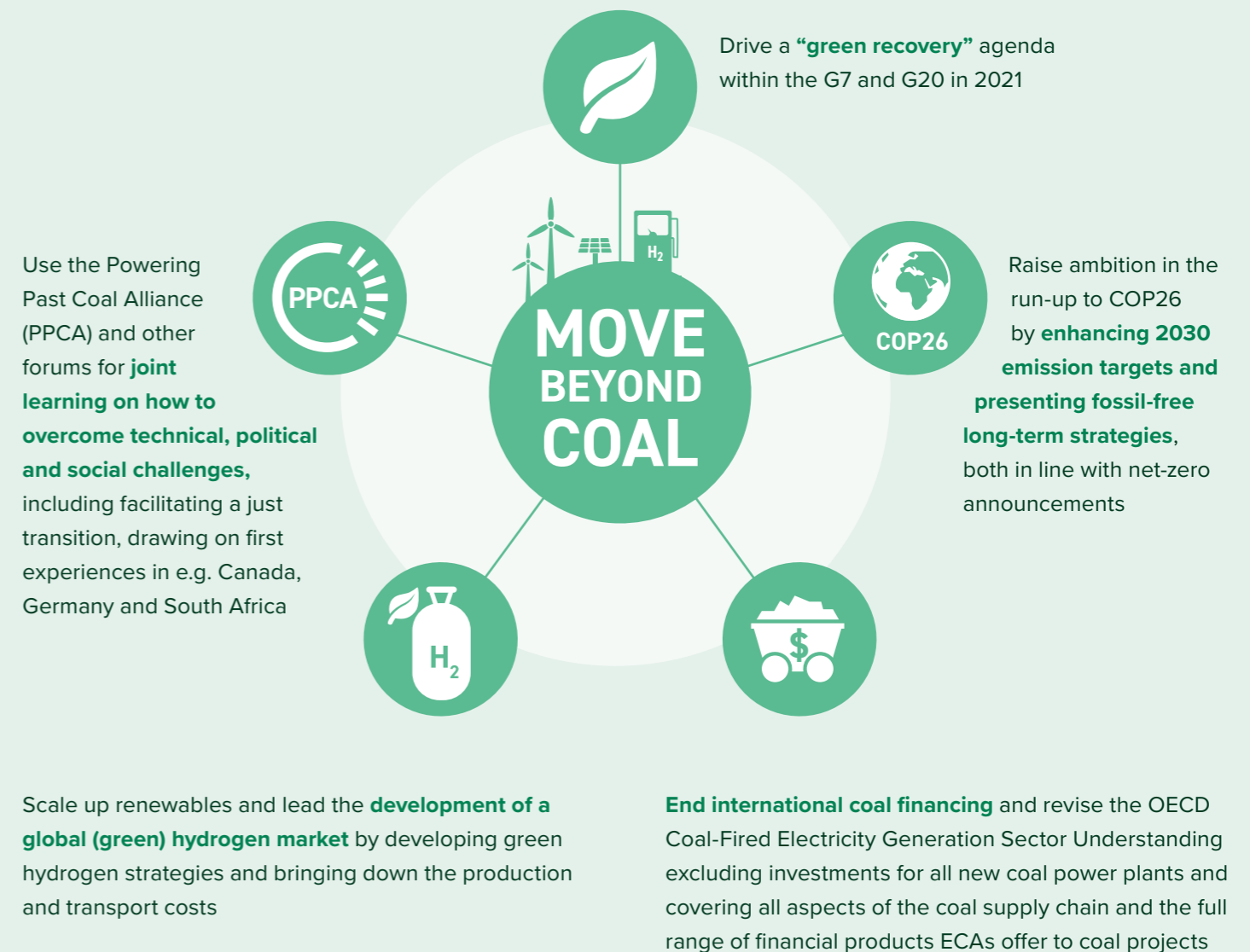
12

NOW IS THE TIME TO SCALE-UP INTERNATIONAL COOPERATION TO MOVE FROM COAL TOWARDS NET-ZERO

To reach net-zero by the mid-century, countries need to rapidly phase out coal (by 2030 in EU/OECD, 2037 in non-OECD Asia, and 2040 in the rest of the world). The net-zero targets announced by major G20 countries indicate a turning point for international climate politics, and there is hope that the US, under new leadership, will contribute to more ambitious action.

Several opportunities exist for G20 countries to increase international action to move beyond coal in 2021 and beyond: 1) driving a green recovery agenda within the G7 and the G20, 2) aligning 2030 climate targets and long-term strategies with net-zero announcements, 3) ending international coal financing and revising the OECD Coal-Fired Electricity Generation Sector Understanding, 4) scaling up renewables and leading the development of a global (green) hydrogen market, and 5) enhancing joint learning on how to overcome barriers when phasing out coal.

Opportunities for G20 countries to increase international action to move beyond coal:



ENDNOTES

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ABOUT

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Climate Transparency is a global partnership of 14 research organisations and NGOs in the majority of the G20 countries. Our mission is to encourage ambitious climate action in G20 countries: we inform policy makers and stimulate national debate. Our Climate Transparency Report is the world’s most comprehensive annual review of G20 climate action: based on 100 indicators, we provide concise and comparable information on mitigation, adaptation and finance.

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