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PANORAMA

Global renewable energies: continued ascension despite the COVID-19 pandemic

Renewables have strengthened over the past 20 years, particularly in the power generation sector, increasingly gaining market shares from traditional energy sources such as coal, oil and nuclear. China is a major producer of renewable energy and a global leader in energy transition. In this context, integrating renewables into the grid is not an option anymore for governments worldwide, in both advanced and emerging economies, even though they face strong headwinds in some regions. This is the case in Latin America notably, where hydropower had been the first renewable electricity source historically, while solar and wind project development is accelerating thanks to their cost effectiveness.

However, the Covid-19 crisis' impacts on this energy segment are of paramount importance currently, since the pandemic disrupted supply chains and labour availability, while access to funding was hit hard as well. These recent trends have hurt already approved projects and futures ones.

As lockdowns around the world pushed electricity prices into negative territory, induced by subdued demand and oversupply, utilities that mainly use traditional energy sources will have to manage a "new reality", where innovations such as battery integration into renewables projects and decentralized power generation could threaten their existence.

Thus, the health crisis' negative spillover effects have had an impact on global renewable energy development in the short-term and challenges will remain in the medium- to long-term. At the same time, some sectors are expected to keep on using more renewable energies, mainly those that intrinsically pollute more because of the nature of their activities and need to comply with stricter regulations, such as chemicals and metals for instance. These sectors also need to adapt to both the evolution of customers' and the public opinion's willingness, as well as to the fact that they are more sensitive to environmental issues, therefore aggravating legal actions against them on the matter.

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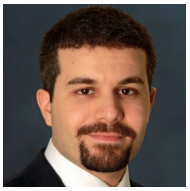

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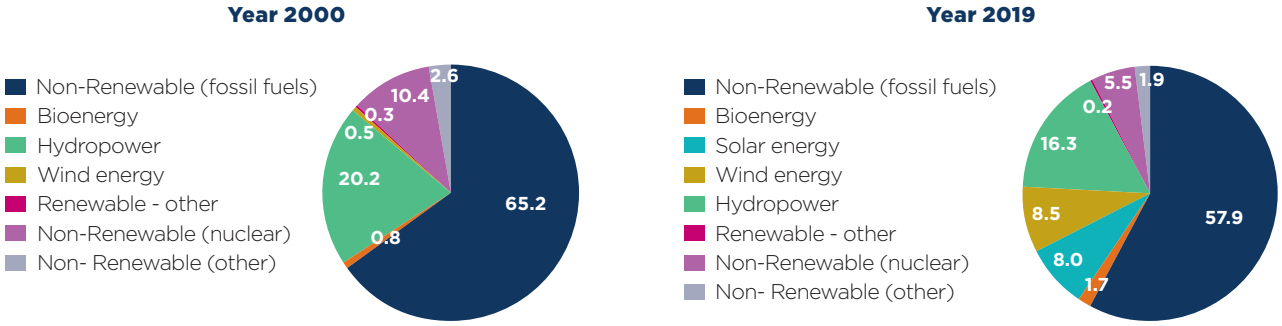
1 DEVELOPING RENEWABLES GOING FORWARD – NOT AN OPTION ANYMORE

Taking stock on renewable development worldwide

Chart 1:
Global electricity matrix – Installed capacity (percentage of total)



Source: Irena - International Renewable Energy Agency, Coface

Since the early 21st century, renewable energy development has gained representativeness in the global electricity matrix. According to figures from the International Renewable Energy Agency (IRENA), renewable resources have gained momentum in recent years, increasing from 21.8% of total global electricity installed capacity in 2000 to 34.7% in 2019, mainly thanks to the rising global consensus that a carbon-based economy is unsustainable. This is underpinned by the link between energy use and climate change[1]. Moreover, fossil fuel availability and reserves are finite, and their price volatility can add to market uncertainties. It is also worth noting that a change within the use of renewable energy sources has been observed. While in 2000, hydropower accounted for 93% of total global renewable capacity, this ratio dropped over time, reaching 47% in 2019. This can be explained by the fact that other sources, notably solar and wind, have gained representativeness in the global matrix (see **Chart 1**).

According to the International Energy Agency's (IEA) estimates, global CO_2 emissions are expected to decline by roughly 8% year-on-year (YoY) in 2020, to the level they were a decade ago. However, this result is not a consequence of renewables development, but a knock-on effect of the COVID-19 pandemic. The renewable energy sector, although not immune from the health crisis' spillover effects, is expected to show higher resilience compared to fossil energies and other sectors. For instance, China added 11.52 gigawatts (GW) of new solar generation capacity during the first half of the year, according to China National Energy Administration figures (slightly higher than the 11.4 GW added in the same period of 2019).

Investments and new auctions on the development of renewable projects worldwide are likely to be postponed to 2021, but not cancelled. Indeed, the IEA's Global Energy Review 2020 estimates that renewables will be the only electricity source to expand year-on-year in 2020. This anticipation is based on the fact that rising installed capacity and priority access to the grid in some markets will enable renewables resilience (a larger share of supply as non-renewables have been pushed out).

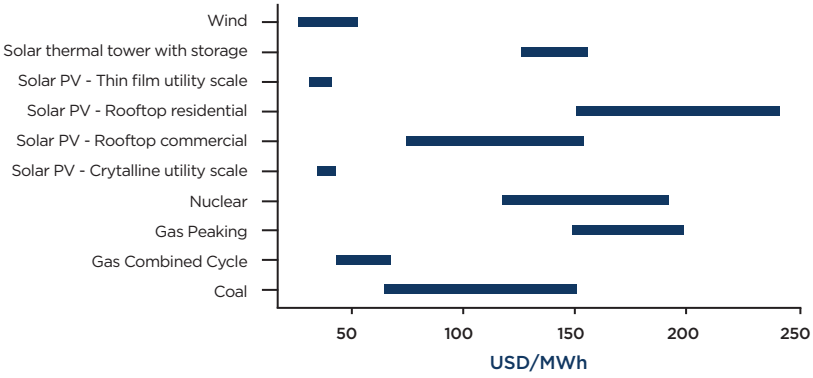
In terms of installed capacity expansion, growth is expected to slowdown overall this year. Coface anticipates that this will be mainly due to ongoing supply chain disruptions and delays in project execution (as side effects of lockdowns), alongside increasing difficulties to access funding in a moment of higher global risk aversion. Having said this, the IEA forecasts that 167 GW of renewable capacity will be added in 2020, a 13% drop compared to the rise in 2019 (albeit still set to increase by 6% this year). For 2021, it expects renewable power additions to bounce back to 2019 levels.

Furthermore, while the sharp drop in oil prices (which accelerated due to the COVID-19 crisis) does affect the cost-competitiveness of renewable sources, there is still strong public support for

1 Climate Change 2014 Report, the Intergovernmental Panel on Climate Change (IPCC), 2014. https://www.ipcc.ch/site/assets/uploads/2018/02/AR5_SYR_FINAL_SPM.pdf

cleaner electricity resources in the post-pandemic era, which is favourable to the renewable energy outlook worldwide. Moreover, this is in a context where decision makers have in mind that depressed oil prices will not last forever and that there are negative externalities in continuing to use fossil energy sources massively versus developing various sources of renewable energies. This is a long-term trend, which officially started with the 2016 Paris Climate agreement[2]. Moreover, their costs have decreased in recent years thanks to various factors including technological improvements, lower equipment costs and economies of scale (**Chart 2**). According to BloombergNEF, solar and onshore wind power are now the cheapest new sources of electricity for at least two-thirds of the world's population. It also mentioned that the electricity cost for onshore wind projects has fallen by 9% to USD 44 per megawatt-hour since the second half of 2019, while solar project electricity cost dropped by 4% to USD 50 per megawatt-hour. The prices are even lower in several countries, including the U.S., China and Brazil.

Chart 2:
Cost of renewables snapshot at a global level for 2019

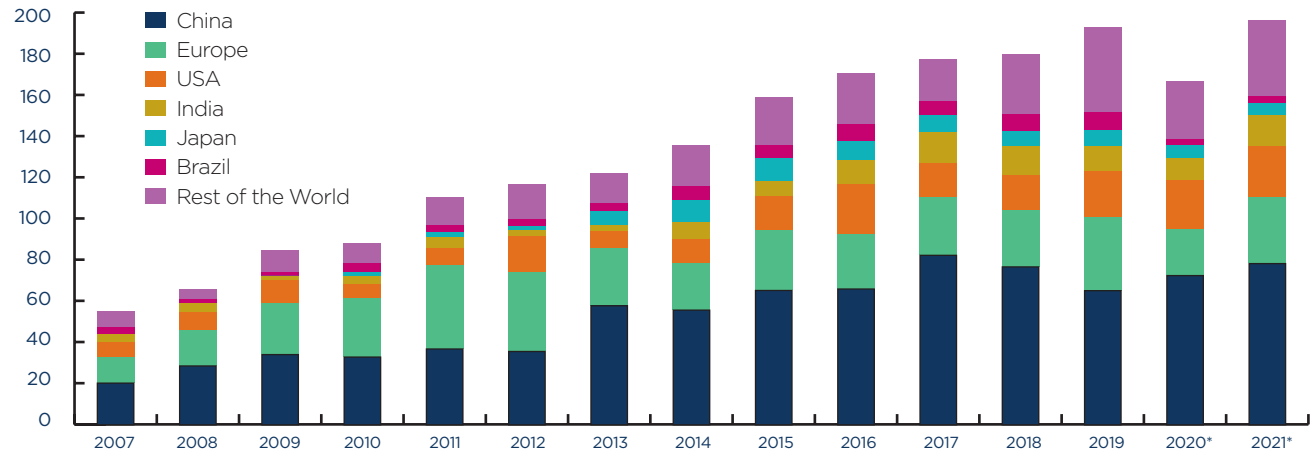


Source: Lazard's 2019 analysis of renewables costs, Coface

INSERT 1:
China's ambition to lead on renewable energy production

China is among the countries that aim to lead this ongoing energy transition (see **Chart 3** below). The Made in China 2025 plan, first released in May 2015, which seeks to engineer a shift for China from low-end manufacturer to high-end producer of goods, also calls for the increase in renewable energy use and promotes the entrance of large-scale renewable sources in the grid. As a reference, global investments in renewable energy amounted to USD 279.8 billion in 2017, with China accounting for 45% of investments (USD 126.6 billion). In that year, the country witnessed a solar boom and the government was unable to control the high number of projects. In 2018, a policy shift took place in order to pull back the solar sector and prevent additional capacity from being built (still investments stood at USD 91.2 billion). Finally, they decreased to USD 83.4 billion in 2019, with the leading position maintained. It is also worth noting that China's race to develop renewables also reached overseas, driven by top-tier local companies (notably China´s State Grid Corporation) who took the lead in global renewable energy value chains. The country´s rapid development of renewable energy signals not only an increase in these energy sources, but also the geopolitical benefits of investing in clean energy sources. China´s renewable investments mostly target OECD member countries in Europe, rather than developing economies. From 2010 to 2017, China invested USD 3.6 billion in renewable energy in Germany, while the largest non-OECD recipient, Pakistan, received only USD 1.6 billion from Chinese investments for this purpose. For instance, from 2010 to 2017, China´s outbound EU investments in wind energy totalled USD 6.8 billion[3]. Overall, this long-term trend should not be reversed by the COVID-19 pandemic.

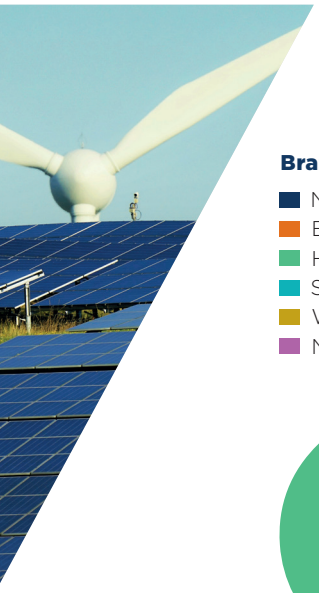
Chart 3:
Evolution of renewable electricity capacity additions



Source: IEA, Renewable electricity capacity additions, 2007-2021, updated IEA forecast, IEA, Paris, *IEA forecast

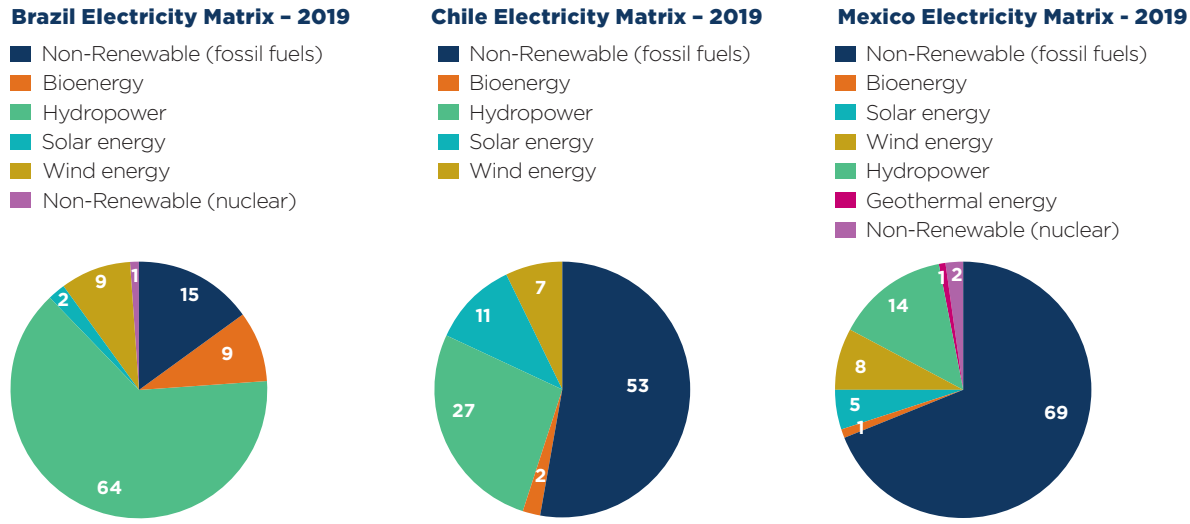
2 The 2016 Paris Climate agreement was signed by 196 governments with the long-term temperature goal to keep the increase in global average temperature to well below 2 °C above pre-industrial levels, and to pursue efforts to limit the increase to 1.5 °C, recognizing that this would substantially reduce the risks and impacts of climate change.

3 Wind Energy: How long will the wind stay in the industry's sails?, Coface, June 2018 https://www.coface.com/News-Publications/Publications/Wind-energy-how-long-will-the-wind-stay-in-the-industry-s-sails



Developing renewable energy despite headwinds: the case of Latin America

Chart 4:
Electricity Matrix in the three leading Latin American markets

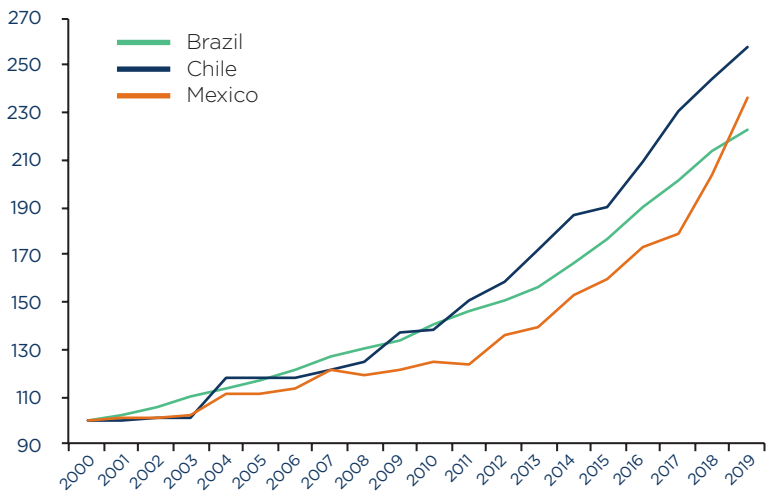


Source: Irena - International Renewable Energy Agency, Coface

Short insight on Latin America's broad track-record and outlook for developing renewable energy

In the early years of the 21st century, many Latin American countries already had their electricity matrix mostly based on cleaner sources, thanks to their large hydraulic potential (materialized by the amount of usable energy from river waters per unit of time). For instance, in 2000, 54% of Latin America´s electricity matrix was composed by hydropower. In that year, countries such as Brazil, Colombia, Costa Rica, Ecuador, Paraguay and Uruguay had over 50% of installed energy capacity linked to renewable resources (basically thanks to hydroelectric). Nonetheless, similarly to other regions, Latin America also started to develop other sources of renewables in the following years.

Chart 5:
Evolution of renewable electricity installed capacity (index 2000 = 100)



Source: Irena - International Renewable Energy Agency, Coface

While analysing in detail the situation for the three major markets for renewables in Latin America, namely Brazil, Chile and Mexico (as described in **Chart 4**), renewable electricity capacity registered relatively strong growth between 2000 and 2019 (see **Chart 5**). In Brazil, while investments in renewables were mainly driven by hydropower (77% of total renewable capacity added to the grid during the period), development in wind and bioenergy also started (contributing by 11% and 10%, respectively). Meanwhile, in Chile, investments came mainly from solar (38%), followed by hydropower (32%) and wind (23%). Finally, in Mexico they were led by wind (44%), solar (30%) and hydropower (20%).

Looking ahead, like in other markets worldwide, the sector is expected to feel the negative spillover effects of COVID-19 (such as postponement of investments and new auctions), keeping in mind that Latin America has been among the regions that struggled most to control the pandemic. Nevertheless, in the medium- to long-term, the overall global outlook for renewables development should remain bright. The success or failure of moving forward will depend on the local political and regulatory environment. That being said, the scenario diverges between the three Latin American countries. Chile seems best positioned for the development of renewables in the post-pandemic era, Brazil is in the "halfway" compared to others and Mexico is the weakest due to recent erratic energy policies.

Chile is the best-positioned market for renewables development in the region

Chile indeed appears to be the best-positioned market for renewables development in the upcoming years, compared to the other largest markets in the region. According to estimates from the local sector regulator Comisión Nacional de Energía (CNE), the country has the potential to

develop 40 GW of wind, 12.5 GW of hydropower, over 1,000 GW of solar and 2 GW of geothermal projects. Moreover, it holds a rock-solid regulatory reputation. Furthermore, Chile is relatively more committed to the global decarbonisation transition than Mexico and Brazil.

As an example of the resilient interest in developing renewables in the country, in April 2020, Chile presented its intended nationally determined contributions (INDC) as part of the Paris Climate Agreement (including investment opportunities estimated between USD 27.3 billion and USD 48.6 billion until 2050). The plan sets a reduction goal of roughly 30% until 2030 and carbon neutrality from 2050 onwards. Chile aims to stay below 1,100 $MtCO_2eq$ (million metric tons of carbon dioxide equivalent) emissions between 2020 and 2030, peaking in 2025 and reaching 95 $MtCO_2eq$ in 2030 (as a reference, the country emitted 112 $MtCO_2eq$ in 2016). Moreover, the plan will focus on six key areas: increasing efficiency in mining and industry (25% of total emission reductions), production and consumption of hydrogen (21%), sustainable construction standards for households, commercial and public buildings (17%), electrified transport (17%), the withdrawal of coal-fired generation plants by 2040 (13%) and other efficiency measures (7%). These carbon budgets are in a bill currently under discussion in Congress. Nonetheless, the massive social protests in 2019 and the COVID-19 outbreak have raised concerns in the short-term. In April 2020, several renewable energy companies sent a letter to the energy minister to protest against changes made to regulations in 2019 and 2020. The aforementioned changes include the price stabilization fund enacted last year (a transitory mechanism to prevent price hikes for households) and the decision to prohibit distribution companies from cutting power to families that failed to pay their bills during the state of emergency, which the government imposed on 18 March to fight COVID-19.

Table 1:
Comparing Brazil's and Mexico's renewable market developments

	Brazil	Mexico
Main features	• Global leader in biomass, second largest in hydropower and eighth in wind power.	• Renewables have experienced a rapid build-up of investments (much of it in wind and solar power) since the 2013 energy reform[4]. • Competitive energy prices - average price achieved in the third auction of 2017 was USD 20 per megawatt-hour, the lowest price for solar in the whole of Latin America.
COVID-19 short-term side effects	• In March 2020, the Ministry of Mines and Energy suspended auctions on power, renewables and transmission that were scheduled for 2020[5]. In early August 2020, ANEEL approved a bidding notice for transmission lines scheduled for December 2020. • The year-to-date depreciation of the BRL is making equipment imports more expensive[6]. • Decree number 10.350 contemplated a financial aid of up to BRL 15.3 billion (roughly USD 3 billion) for companies operating in the sector.	• In April 2020, Grid operator Cenace suspended preoperational inspection tests for wind and solar parks, under the pretext of ensuring grid reliability amid reduced electricity demand during the COVID-19 crisis (although courts halted implementation) • Energy regulator CRE authorized the state electricity utility CFE to hike rates on electricity transmission tariffs for private generators. • Consequently, rates were raised between 428% and 811%.
Long-term perspectives	• Halfway between Chile and Mexico. • Despite the federal government's lack of engagement towards environmental topics, private investments in renewables should resume thanks to a pro-market and privatization agenda (including the local leader in generation and transmission SOE Eletrobras). • Threat: the political risk could cause knock-on effects on the government´s pro-business agenda and needed regulatory improvements. • Transmission infrastructure gap remains a challenge, affecting power supply.	• Most negative outlook among the three countries - economic policies have damaged the business environment. • The regulatory shift caused by President Andrés Manuel López Obrador's (AMLO) push to strengthen the positions of CFE and public oil company Pemex. • In 2019, the government cancelled the fourth round of auctions for permits to supply renewable energy to the grid and altered a rule that established a banking market for "clean energy certificates" (CELs). The change allowed older state-owned hydroelectric energy plants to participate as well (a judge ruled to suspend the change in December 2019). Local business association CCE (Consejo Coordinador Empresarial) cried out that the recent policy changes violate the rights of all sector participants, putting investments worth over USD 30 billion at risk.

4 The 2013 energy reform allowed private and foreign investment across the energy value chains for the first time in 75 years.

5 This included renewables auctions by the local electricity regulator ANEEL, which were programmed for May 2020 and would have set projects of 28.66 gigawatts (GW) of solar, 20 GW of wind, 1.14 GW of biomass and 600 MW of hydropower.

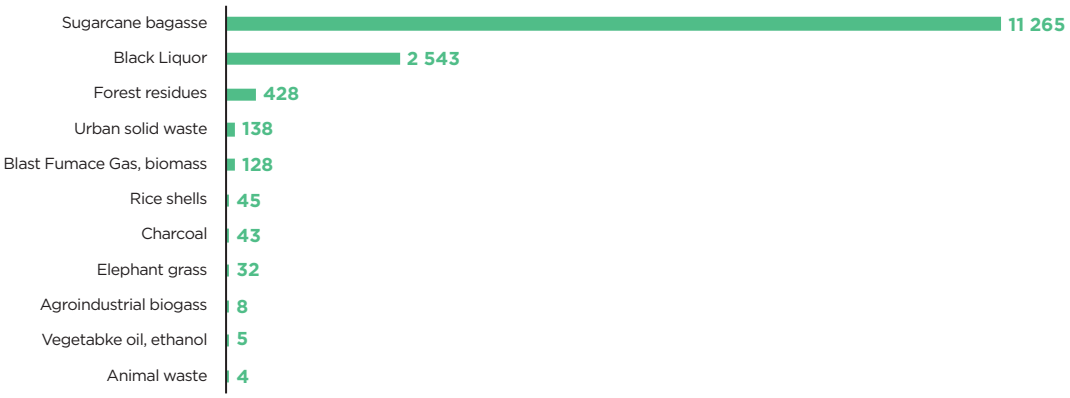
6 While in the wind segment, the local industry is able to deliver roughly 80% of turbines, in the solar segment, most of the equipment are imported from China.

INSERT 2:

Emerging market example of renewables creation – biomass from sugarcane in Brazil

Brazil is the second largest global market for bioenergy electricity (just behind the United States). According to IRENA, it accounted for 9% of the country´s total electricity installed capacity in 2019. In fact, the local development of the segment is mainly associated with sugarcane. The country is the largest producer of this agro-commodity and energy cogeneration became a secondary process resulting from the use of waste from the primary industrial process. For instance, the sugarcane industry, which produces sugar and ethanol, uses its bagasse as fuel to produce electricity. This means that what was previously a waste from the sector becomes an input for the manufacturing of a third product: bioelectricity. It is produced by burning bagasse in boilers (generating heat), which passes through a turbine and turns into mechanical energy. Then it goes to the generator and becomes electrical energy. Overall, this electricity drives the engines of plants, which are self-sufficient, and the surplus is made available by most of the state's plants to the National Integrated System (SIN). According to the Energy Cogeneration Industry Association (Cogen), Brazil has 18.6 GW of installed capacity in cogeneration plants, 15 GW of which produce energy from biomass, black liquor, and wood residues, among others. Sugarcane bagasse plants account for 77% of total biomass plants. Moreover, taking into account the same source (albeit energy sales represent 10% of revenue from sugarcane harvests), this corresponds to 30-40% of the factories' profitability.

Chart 6:
Installed Biomass Power Capacity by energy source in Brazil, MW, March 2019



Source: ANEEL, Coface

Currently, the environment is clouded by the COVID-19 crisis (causing a drop in electricity usage and requests from energy distributors to review long-term contracts). Nevertheless, the segment is likely to return to growth after economic activity recovers. The main hindrances to growth are related to the need to boost investments (modernization of sugarcane growing techniques) and improve the regulatory framework. In this sense, the change in legislation promoted in June 2019, which added the biofuel sector among the industries that applied for the named *encouraged debentures,* tends to foster the segment. For instance, the latter can be issued with the aim to finance projects related to implementation, modernization and maintenance. As a result, the Brazilian Sugarcane Association (UNICA) expects this change to foster sugarcane bagasse power capacity, expanding output by 60% by 2030. It is also worth noting that the electricity coming from bagasse still needs to become more competitive in terms of prices. It is still relatively more expensive than other renewable sources, such as wind and hydropower (reducing its competitiveness in recent auctions). As an example, the figures of January 2019 referring to the consolidated result of an auction held by the Chamber of Electric Energy Commercialization (CCEE) showed the average price of biomass at roughly 238.6 BRL per MWh (roughly USD 65 at the January 2019 rate), well above wind (46 BRL/MWH) and hydropower (44 BRL/MWh). The relatively high price is attributed to costs related to the implementation and connection of cogeneration plants to the SIN. The latter accounted for 60% of total generated power in biomass plants, while the remaining 40% is linked to self-consumption. In terms of plants, according to UNICA figures for July 2019, out of the 404 sugarcane bagasse power plants, 169 were entirely dedicated to self-consumption.

2 RENEWABLE ENERGY DEVELOPMENT AND ASSOCIATED INNOVATION OUTLOOK

Multiple challenges lie ahead

Shocks in supply chains

While infrastructure projects in renewable energy were on the rise since the beginning of the 2000s and were bracing for another year of steady growth in 2020, the COVID-19 shock turned initial anticipations upside down. According to the IEA[7], the COVID-19 pandemic will strike many triggers of the renewables' rise and will cause capacity additions to decrease by 13% in 2020, after ten years of steady growth. However, 2021 could witness a rebound in yearly capacity additions with a growth of 17%, thus helping the sector to equate 2019 levels, mainly thanks to delayed projects coming online. Europe will show the largest decrease due to stringent lockdowns in several countries, and smaller auction appetite from investors. In a study[8] published in July, the Bloomberg New Energy Finance (BNEF) observed that during the first semester of 2020, offshore wind final decision investments grew by 319% compared to the same period of the previous year, pushing global renewables investments to grow by 5%. However, solar and onshore wind, the bulk of renewables, decreased by 12% and 21%, respectively. Offshore wind projects were bigger, as their cost has continuously decreased since 2012, and developers were rushing to benefit from Chinese subsidies ending in 2021.

Moreover, lockdowns across the world brought supply chains to a halt, as many plants were shut down for safety reasons, notably in China, an essential global actor in renewable energy (**see Insert 1** p. 3). Therefore, lockdowns and difficulties in China led to disruptions on the whole value chain worldwide.

Equipment could not be shipped, which caused delays in solar farm facilities. Many input products come from provinces in China hit by the epidemic, which forced plants in Southern Asia or in the United States to lower their own activity. China is home to 70% of all photovoltaic modules production globally, and the slow recovery will only be fully effective at the end of first semester of 2021 (H1) and during H2.

For instance, in Europe, a 3-month delay in the shipment of critical parts could translate into a prolonged extension of construction, assessed at up to 6-months due to environmental restrictions.

Labour shortages were also felt, as many countries closed their borders to foreign workers. We expect these shortages to disappear gradually towards the end of the year, as plants have started to reopen since the second quarter, but the shock could remain roughly until the end of the year for current projects. Nevertheless, higher equipment prices is one aspect of these shortages that might last for the remainder of the year, and could impact the subtlety of project development, as the economics of the projects rely on price assumptions made before the onset of this crisis. However, demand for insurance products may pick up in the near future, to protect buyers from "force majeure" disruptive effects on electricity delivery when projects are delayed due to pandemics[9].

Finally yet importantly, public administrations were disturbed by lockdowns as well, causing approvals to be postponed and affecting developers financially, adding to their woes regarding lack of revenue stability induced by volatility in electricity prices.

Liquidity constraints

The renewables sector depends highly on access to financing and needs to develop its infrastructure to generate electricity. As such, it shares a similarity with the oil and gas industries, or with thermal coal, when hydrocarbons are used as primary inputs to produce electricity. According to the United Nations Environment Program (UNEP), around 75% of all funding come from asset finance[10] (**Chart 7**), mostly from private entities. Using one's own balance sheet to finance a project bears high risks, particularly when conditions change dramatically. Financing may dry up, because financial institutions have to make some provisions, as risks are increasing in many sectors of the global economy. This lower availability of funds will squeeze projects with lower returns or with higher associated risks. Investors' confidence has already been impacted by the shockwave of the pandemic, but also by the creditworthiness of electricity purchasing entities (see below). Investors commit to longer-term contractual clauses, which are based on a certain level of stability, but many economic agents such as States (and their related public entities), corporates and banks are already highly impacted. Public and corporate debts are expected to soar, while banking activity may suffer from the costs induced by non-performing loans and stricter regulations. Moreover, liquidity could become scarce, as economic activity is contracting globally, while political risks and trade disputes are on the rise as well. Furthermore, since projects are riskier than before, investors could ask for higher returns or lenders could increase their interest rates, which may further push some renewables developers out of the market.

7 Renewable Energy Market Update, IEA,2020. https://www.iea.org/reports/renewable-energy-market-update

8 https://about.bnef.com/blog/colossal-six-months-for-offshore-wind-support-renewable-energy-investment-in-first-half-of-2020/

9 https://www.windpowermonthly.com/article/1674748/insurance-little-help-coronavirus-hit-wind-sector

10 https://wedocs.unep.org/bitstream/handle/20.500.11822/29752/GTR2019.pdf

Chart 7:
Global breakdown of renewables projects' funding origins (% of total funding)

Sources: UNEP, BNEF, Coface

High electricity price volatility looking ahead

As global economic growth was impacted by the sudden implementation of lockdowns in several parts of the world, we expect electricity consumption to decelerate consequently. This is particularly true for many emerging markets, where the manufacturing sector is not mature enough and is highly energy-intensive. OECD countries are located on the opposite side of the spectrum, where economic activity is less dependent on energy use, mainly electricity, thanks to higher efficiency enabled by the manufacturing sector and the preponderance of the services sector[11]. However, while this decoupling is well known, a recession, which Coface anticipates for 2020 in many countries, will be followed by lower electricity demand. According to Eureletric, a professional association of electricity producers in Europe, the lockdown induced hourly prices will be negative, and further accelerate the long-term decline of gross prices in this region[12]. The main rationale behind this trend was a 5% drop in demand in Q1 2020, while better weather conditions caused higher electricity generation from renewables. However, stay-at-home orders delayed the maintenance of power plants for the coming winter, which contributed in putting the supply-demand balance into disarray.

With several renewables projects set to materialize in 2020 and 2021, higher electricity supply coming from renewables should push wholesale electricity prices in negative territories. Furthermore, many renewables developers in the United States are selling their electricity directly to customers ("merchant projects"), without passing through the utility grid, and will be impacted by lower revenue induced by the lower activity of their customers. This trend is a consequence of the development of reverse auctions bids, enabled by both governments and their regulators' will to decrease the cost of subsidies (notably through feed-in-tariffs schemes). As such, developers are facing lower and more volatile market prices, as prices are not guaranteed like they were in the past[13]. Developers and their investors could be the recipients of higher credit risk in case of prolonged periods of lower electricity prices, but developers who are on PPA schemes[14] could mitigate this. From the producers' side, a good example is Orsted,

11 https://www.eia.gov/todayinenergy/detail.php?id=33812
12 https://www.eurelectric.org/covid-19/
13 https://www.mckinsey.com/industries/electric-power-and-natural-gas/our-insights/merchant-risk-management-the-new-frontier-in-renewables
14 A Power purchase agreement is a contract between a buyer and a seller of electricity on pre-agreed terms linked to prices and tenure.

a Danish renewables electricity producer, which has made provisions to counter heightened risks from some of its customers[15]. As liquidity could become scarce for many corporates around the world, creditworthiness of electricity buyers could decline, like in the case of Covestro AG, a German chemical company buying electricity from Orsted (generated by a wind farm), who saw a credit rating downgrade by Moody's in end-March 2020.

INSERT 3:

Will Europe still be a "powerhouse" for renewable energy beyond the "COVID-19 pandemic era"?

In 2019, the European Union (EU) pledged a multiyear plan to make its economy sustainable, by using its resources more efficiently and fighting pollution[16]. Renewables are one of the main targets, and the European Commission (EC) asserted its commitment to push for higher integration of renewables into the different electricity grids and to finance research and development. While these propositions were warmly accepted by the renewables industry as a whole, they fell short of what the industry considered a true answer to the challenges posed by COVID-19. Renewables energy developers are urging the EC and member States to ease permit allowances[17] and access to financing. At the time of writing, there are no detailed insights about renewable energy development plans in the pan European green recovery project announced in June 2020. Indeed, there is no consensus (at the time of writing) between member States on the actions to take. Furthermore, some members, such as Greece and several Eastern European countries, are urging their counterparts to first focus on the economic challenges caused by the pandemic rather than engaging into the path to carbon neutrality. Therefore, whether the intiative launched in 2019 by the EC will continue or not in the "post-pandemic" era remains unclear at the time of writing.

Keeping an eye on the integration of renewables into the grid

There is a general and shallow perception that renewables had a bad impact on utilities. The intermittency of electricity generation pushed utilities to commission 'backup plants', particularly in the case of wind energy generation, generally natural gas powered, to compensate for the lack of electricity during the night or in absence of wind. While balancing power with neighbour countries, electricity is a way to counter the negative effect of intermittency. Since European countries have developed integrated grids, the interconnection of these national power systems can mitigate risks in periods when renewables cannot generate power[18]. Nonetheless, the European case is seldom encountered around the world, as national grids lack interconnection. Imbalances between supply and consumption are also alleviated by improving weather forecasting techniques. On the demand side, advanced metering systems help by identifying customers' needs precisely. However, utilities have to manage a legacy of nuclear and fossil fuel powered plants, which are expensive to run when not used at full capacity. Utilities were able to cope with some of the negative effects, by hedging their production or by selling it within longer-term contracts with fixed prices, contrary to merchant exposure, a type of spot market where prices are highly volatile.

The lack of continuous electricity generation from the renewables side, particularly when demand is higher, has an impact on utilities' profitability. This led companies around the world to propose the integration of battery to store electricity, to smooth supply and match demand needs. Batteries could be a game changer, as already the case in the automotive industry with the irruption of electric and plug-in hybrid vehicles. One reason behind this widespread adoption is that the cost of batteries will drop over the next decade, as more and more companies rush to develop their own supply, and by economies of scale becoming more prevalent accordingly. Batteries will be integrated into utilities' grids in order to help them cope with intermittency and to supply the grid with electricity collected during the day or when winds blow. However, this is a 'double-edged sword', since batteries can help decentralized systems of production without customers connecting to grids. As investors and insurers are pushing fossil fuels out of the power mix, for various reasons, utilities are facing a conundrum. The legacy has to be managed, even against the public opinion's pressure. Large nuclear plants do not seem appealing anymore, much like coal fired plants. However, they are here to stay, as nuclear plants in Europe are the key source of base load. Moreover, the financial ability of utilities, notably those under the regulation of local governments or the central State, is under strain, as selling prices cannot change dramatically. In the meantime, power producers face higher costs and a strong need to invest, in order to manage the environmental transition. Utilities need to develop large-scale battery systems in order to keep up with decentralized power systems. They need to spend money on pilot projects while waiting for a full deployment later. As things are changing quite dramatically and relatively quickly, the widespread adoption of battery is only a matter of time and could become a mandatory trajectory for utilities, as it is combined with the rise of renewables and will affect these actors financially. Furthermore, lower fossil fuels prices (notably oil and natural gas) will pose a conundrum to many utilities, particularly those which are regulated. They will be facing a tough choice: using fossil fuels because of their lower cost or banking on the bonanza created by renewables and battery storage of electricity.

15 https://orstedcdn.azureedge.net/-/media/www/q12020/investor-presentation-q1-2020.ashx?la=en&rev=b9e72433a257498090e9aede2d21d5e6&hash=62C9AC265426F1F01F9C86C3C16AC3A9

16 https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en#latest

17 https://www.evwind.es/2020/06/11/eu-recovery-plan-its-time-to-roll-up-our-sleeves-for-a-green-recovery/75083

18 https://www.tdworld.com/renewables/article/20973433/renewable-energys-impact-on-power-systems

19 For a complete list of sectors covered by Coface, see https://www.coface.com/News-Publications/Publications/Country-Sector-Risk-Barometer-Q2-2020-Quarterly-Update

Chemicals, Metals, Paper, Wood and ICT[19] sectors are expected to be the largest users of renewable energy

Customers, both households and businesses, want to save money by lowering their electricity bills and to have a choice regarding the source of power (natural gas, nuclear, solar plant, etc.). For instance, many corporates and institutions are facing huge pressure to lower the environmental impact of their operations, by installing solar panels on their rooftops for instance. They are also engaged in pilot projects with electricity storage associated to battery systems. Corporate sourcing of electricity generation from renewables is on the rise, notably in Europe, Asia and North America, but also in emerging countries. According to a 2018 study from the IRENA[20], the main sectors sourcing their electricity needs from renewables are activities linked to materials, that is to say mainly chemicals, wood (pulp production activities) and paper, miners and metal makers. This is mainly because the capital intensity and the polluting aspects of their operations are pushing them towards renewables, to comply to stricter regulations and active scrutiny from environmental activists and public opinion, but also to lower their costs, as renewables are becoming increasingly cheaper.

Corporate Social Responsibility (CSR) is actively sought after by companies, particularly in high label ranking, and is identified as of nature to contribute to a positive marketing brand image for a company, with the potential to prevent legal risk, particularly when it emanates from actions by environmental associations for example. Indeed, this can be a devastating blow to corporate reputation otherwise, and many investors are seeking to divest from highly polluting sectors, constrained by campaigns from the civil society. After the costs are factored in, sourcing electricity from renewables seems a desirable investment, which can be designed/ built up in various ways. For instance, a company can pay an independent producer to purchase what it needs through Power Purchase Agreements (PPA), can place panels on its rooftops, build windmills, or buy certificates sold on financial markets by an electricity producer from renewables. Around 39% of electricity sourced from renewables come from self-generation, that is to say when a company produces its own electricity. Corporates from the abovementioned manufacturing sectors are using this form of generation due to their high volume of electricity consumption. While electricity from renewables accounts for only a tiny part of their overall electricity demand, this share is expected to grow in the upcoming years, since it is a general trend. Companies are indeed required to fight against climate change and its impacts on the environment. In terms of inducements for them to do so, there are regulatory frameworks and several public incentives (see **Insert 3** on Europe p.9 for example)

In this regard, the large international e-retailer company Amazon's approach to renewable energy is emblematic of that of the American 'tech giant'. Similar to peers in the technology sector, it needs large quantities of electricity for its datacentres around the world. The company built and is building utility-scale solar projects in the US and in China for that purpose[21]. Large corporates in the United States are forsaking utilities for their electricity needs. For instance, retailers such as Walmart and Costco are quitting utility Dominion Energy, and Apple and Microsoft are highly reticent of the utility's projects to produce more electricity from natural gas[22]. Utilities have to manage a legacy of fossil fuel powered plants and cannot turn overnight towards more renewables inclusion, even though they invest and provide some US counties with electricity from solar plants[23]. Therefore, this remains a key challenge for utilities companies going forward.

19 For a complete list of sectors covered by Coface Economic Reseach Department, see https://www.coface.com/News-Publications/Publications/Country-Sector-Risk-Barometer-Q2-2020-Quarterly-Update

20 https://irena.org/publications/2018/May/Corporate-Sourcing-of-Renewable-Energy

21 https://press.aboutamazon.com/news-releases/news-release-details/amazon-announces-five-new-utility-scale-solar-projects-power

22 https://www.greentechmedia.com/articles/read/how-4-top-u-s-utilities-are-grappling-with-the-energy-transition

23 https://www.environmentalleader.com/2020/01/virginia-county-purchases-power-from-new-amazon-arlington-solar-farm-2/

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