



THE CORONA VIRUS PANDEMIC

IMPACT ON THE EUROPEAN RENEWABLE ENERGY MARKET

3RD APRIL 2020

EXECUTIVE SUMMARY

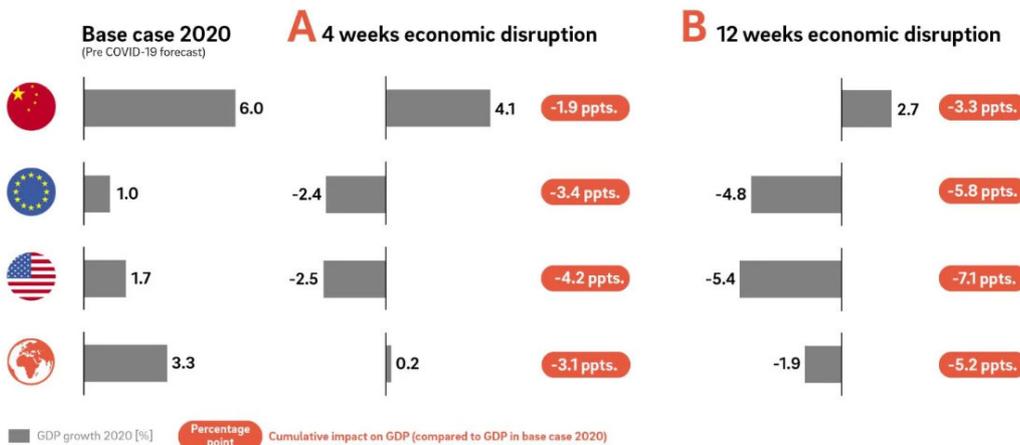
- Electricity pricing tumbles across Europe, with large differences across single markets
- Operational projects not exposed to merchant price risk are mostly unaffected by the COVID-19 pandemic so far
- Delays in projects under construction appear unavoidable, but so far deemed to have limited impact
- While the situation creates issues, especially on non-operational projects, it also creates opportunities for investors

1. INTRODUCTION

Coronavirus disease 2019 (COVID-19) is an infectious disease, which was first identified in December 2019 in Wuhan, the capital of China's Hubei province, and has since spread globally, resulting in the ongoing 2019–20 coronavirus pandemic.

To contain the virus strict measures have been put in place, which have already led to a severe fall in global stock markets, with disruptions in global supply chains and rising unemployment figures having a negative impact on Gross Domestic Product (GDP) growth projections. As illustrated in chart 1, according to consultant Roland Berger, assuming a 12-week economic disruption, annual world GDP growth is forecasted to drop by 5.2% from 3.3% (pre- COVID-19 forecast) to -1.9%.¹

CHART 1: TWO SCENARIOS DEPENDING ON DURATION OF ECONOMIC DISRUPTION¹



Various industry commentators have already sought to assess the impact of the COVID-19 crisis on a range of markets, including infrastructure. “[W]hile declines in the use of infrastructure such as toll roads and airports are having severe immediate impacts on cash flows for related infrastructure projects, positively for the power sector, markets do not at present appear to be forecasting similarly severe declines in power demand [...] Meanwhile, it is reasonable to assume that most of that demand will be restored once coronavirus-related restrictions are limited.”² This implies that operating renewable energy plants will be less affected.

It needs to be highlighted that the development around the COVID-19 crisis is still highly dynamic; this paper therefore seeks to give a snapshot of the situation as of the date of writing.

¹ Source: Roland Berger, 26th March 2020, Latest Update of our corona economic impact series, <https://www.rolandberger.com/en/Point-of-View/Coronavirus-Current-status-and-economic-impact-forecast.html>

² Source: Watson Farley & Williams, Renewables in the Time of Coronavirus, 26 March 2020

2. IMPACT ON ELECTRICITY MARKETS

With the above said, it appears obvious that these developments will leave their marks in the European economy, including electricity markets.

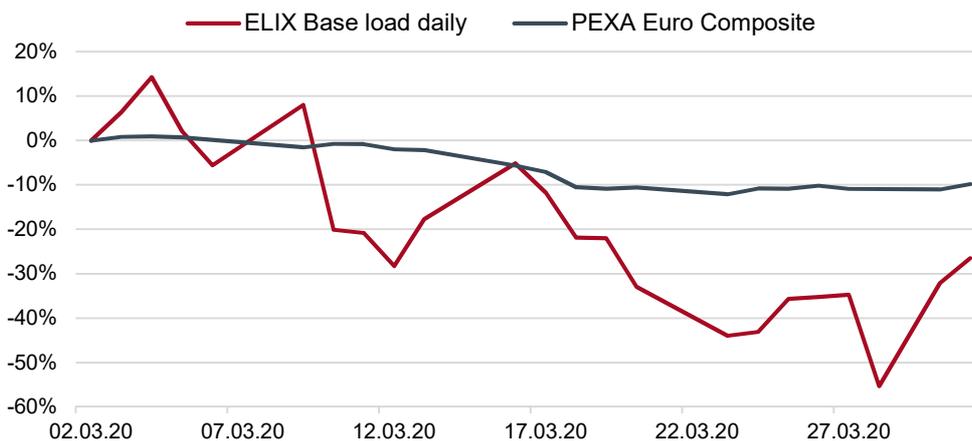
Due to shut-downs in industrial production and reduced overall consumption, electricity demand across Europe has fallen by -15% on average since beginning of the year and, according to the International Energy Agency (IEA), with significantly varying impact between single national markets (-5% to -20%). These differences can at least partly be explained by (i) varying levels of industrial activity, (ii) different national strategies of fighting COVID-19, ranging from soft limitations on public and business life up to full society-wide lockdowns, and (iii) different stages of the pandemic and the respective route of the chosen national strategy. Across 2020, a consumption decline of up to -9% is projected, a figure that obviously already reflects a certain recovery assumption for H2/2020.³

Electricity pricing tumbles across Europe, with large differences across single markets

Besides varying demand, strong supply from renewable sources in particular as well as the decline in oil price since the beginning of the year have put additional pressure on the electricity markets. Consequently, electricity pricing was depressed: almost every European electricity market shows price deteriorations, but also with high volatility between single markets. While the system price in NORDPOOL has declined by -15% since the beginning of March, markets such as Germany have seen a deterioration of spot pricing reaching nearly 30% over this time period. The European price index ELIX declined around -27%.⁴

Focusing on mid- to long-term offtake contracts, PPA pricing follows the trend in the spot market, but with clearly lower magnitude: The European PPA price index as published by Pexapark declined by some -15% since beginning of the year, with variations between -10% to above -20% for single national markets. During March, the decline has actually flattened out (-10%). Despite the fact that contracts are still signed, contracted volume has also been impacted negatively.⁵

CHART 2: EUROPEAN SPOT PRICE & PPA PRICE INDEX COMPOSITES



³ Source: <https://www.iea.org/commentaries/the-coronavirus-crisis-reminds-us-that-electricity-is-more-indispensable-than-ever>
<https://www.icis.com/explore/resources/news/2020/03/27/10487371/european-power-and-carbon-markets-affected-by-covid-19-an-early-impact-assessment>;

⁴ Source: <https://www.eex.com/de/marktdaten/strom/strom-indizes/auktion#!>
<https://www.nordpoolgroup.com/historical-market-data/>

⁵ Source: <https://quote.pexapark.com/##ppa-index>

3. CURRENT IMPACT ON RENEWABLE ENERGY PROJECTS

OPERATING PROJECTS

Despite the very adverse impact on public and economic life, consequences for operational assets in the renewable energy space appear limited so far: in most countries, and especially those with more restrictive COVID-19 measures like Italy and Spain, energy generating assets, including wind farms and PV parks, are deemed to be systemically important assets. Consequently, the current lockdowns seen in countries across Europe do not prohibit regular maintenance work on those facilities in general, but introduce additional, and partially restrictive, protective measures such as limitations regarding the number of technicians onsite at the same time, special measures for work force protection, etc. So far, most service providers appear to be operational and fulfill their obligations according to contract.

In terms of the availability of spares and consumables, the picture is two-sided. On the one hand, service providers still operate by using spares and consumables held on stock or being sourced locally and there are no broader signals of shortage in supply. But this capacity might be limited if the situation with disrupted supply chains and transportation logistics as well as complete lockdown of the broader industry continues for longer. On the other hand, when taking a look towards Asia and in particular China, the first signs of recovery in industrial production are visible, feeding the impression that restocking of spares and consumables, which was expected to become an issue just weeks ago, might not be such a limitation in the foreseeable future. Nevertheless, non-necessary improvement works, such as exchange of PV modules due to low performance ratios, are being postponed by some weeks or months in order to ensure availability of the necessary spares and work force.

There is at present no broader trend in the market to trigger Force Majeure or Material Adverse Effect (MAC) clauses. Mostly, those clauses are individually worded, limiting the reliability of generalised statements on the adequacy of triggering such clauses, as this will be a case-by-case decision. COVID-19 impacts are unlikely to be covered under insurance cover like business interruption as those policies typically are triggered by physical damage events, and not by disruptions in supply chains.

In terms of electricity offtake, contracts like private PPA's and tariff-based contracts are being executed according to contract. From today's perspective, change in law actions are not visible or foreseeable, and appear unlikely subject to the economic conditions and pace of recovery of the respective country post COVID-19. But as countries have taken measures in the past to balance the respective support regime and budget (e.g. Spain), the related risk appears limited, from this pandemic. So far, no European country has announced a modification or full stop of the existing support regimes for renewable energy because of COVID-19. On the contrary, as economic stimulus for the post COVID-19 time is discussed and seen as being necessary across Europe, positive impact on the industry could result. Further, support can be seen when it comes to approval process on greenfield projects, as described below.

On the private offtake side, deterioration of creditworthiness of single PPA counterparties, ultimately down to insolvency proceedings, might result from the current lockdowns. As projects typically contract only under one single PPA, there is concentration risk present. A well assessed creditworthiness of such contractual party pre-contract signing mitigates this risk. Re-contracting of such projects in the current market environment appears challenging, and will almost certainly have an adverse impact on project economics as the entering party will refer to the current market conditions for contract pricing.

Operational projects not exposed to merchant price risk are mostly unaffected by the COVID-19 pandemic so far

PROJECTS IN DEVELOPMENT & CONSTRUCTION

For projects currently under construction, and especially in early stage, the picture is different: despite the initial assumption of large construction delays due to disruption in supply chains and unavailability of hardware - particularly for large components and PV modules from China, triggered concerns on so-called Force Majeure events - delay notifications have only been those of several weeks, mostly in connection with logistic issues. Those delays are well within the typically delay contingencies one would expect in a prudently structured project schedule. But even with hardware components being available, projects currently face challenges as a specialised work force is increasingly affected by infection risk, and are thus subject to increased health safety and environment (HSE) requirements onsite (e.g. separation of staff, limitation of total number of workforces on site, key personnel not being allowed to interact with colleagues). In addition, physical meetings between construction partners to coordinate upcoming construction steps and timeline as well as site visits in order to monitor the construction process have stopped completely. Transfer to digital meetings requires adjustments to processes of all parties, causing potential delay for implementation reasons. But still, contract execution, for example for new turbine orders, continue. Contractual parties start to include specific COVID-19 wording to clarify Force Majeure and related delays, but up to here there is no halt in terms of new hardware contracts being signed. In the mid-term, a longer persisting impact on the wind industry, due to higher complexity in production, logistics and approval processes is expected, compared to PV.

Delays in projects under construction appear unavoidable, but so far deemed to have limited impact

Projects in development are also affected, as the workforce of developers need to organise their work processes under changed conditions. Not all of them are already operating in a fully digitalised world or are able to adopt quickly into one. On the other hand, public authorities acknowledge these current challenges and provide support, for example by extending deadlines within the formal approval processes or within tariff auctions. Moreover, in some jurisdictions, an increased responsiveness of governmental bodies can be observed. Nevertheless, as public bodies are generally concentrating on the COVID-19 related topics, a recognisable delay in decision making on administrative level can be seen across Europe affecting the development pipeline.

PROJECT AVAILABILITIES

The market for renewable energy investments remains active, but with declining volume and varying impact on pricing: due to the overall deterioration in the electricity markets, projects with embedded offtake price certainty (e.g. FIT-based remuneration or signed PPAs with pre-crisis price levels), benefit from a clear increase in valuation as those higher future cash flows provide safety cushions and boost valuation compared to current market levels. But the availability of such projects is limited. For projects without such protection, valuations have dropped as buyers reassess individual opportunities based on current electricity markets.

On the other hand, liquidity constraints on project developer level also drive market activity. As project developers tend to be comprised of small to middle size companies with more or less healthy financial conditions, their need to generate revenues in order to cover fixed cost will increase over time. This might open up opportunities for investors having the financial resources and risk appetite to secure attractive projects at a lower cost albeit with inherent open offtake price risk at early stages of project development.

While the situation creates issues, especially on non-operational projects, it also creates opportunities for investors

Finally, as the project development pipeline currently faces a congestion, hardware pricing might become under pressure when production and transportation capacity ramp up quicker than the development pipeline recovers, with positive impact on project capex and consequently on returns.

4. CURRENT IMPACT ON FUNDING AND FINANCING

KGAL generally applies a moderate level of leverage at asset level of around 50 % and has the flexibility to go in first with all equity and refinance at more attractive terms and conditions at a later stage, for example after certain development risks have been reduced or the COVID-19 situation has normalised. To date, at KGAL all discussions with banks regarding debt financing of renewable energy projects that were initiated before COVID-19 crisis, are continuing as expected. Nevertheless, some impact of COVID-19 on the liquidity in the debt markets due to reassessment of internal risk appetite of lenders might materialise. The latter is particularly likely for banks, which are currently facing liquidity issues due to changed ratings.

Regarding equity investments from our institutional investors we have received varied feedback: while some investors are risk-off in the short-term (i.e. until Q2/2020), others are still reviewing new project and fund investments and looking at secondary opportunities. All investors are however also currently focused on reviewing and assessing their existing portfolios, as well as the business continuity risk associated with their respective GPs. In the mid-term, investors expect to have continued interest in actively managed greenfield renewable energy funds. In the long-term, we expect investments in renewable energy to further increase as this asset class is considered to be an attractive portfolio diversifier with a considerable portion of contracted income, combined with a positive impact on climate change. Additionally, renewable energy investments currently prove to be more resilient against the current adverse impact of the COVID-19 crisis. Electricity consumption, even while impacted by the current reduction in industrial production and lockdown measures, still serves basic needs of the society and is expected to recover quickly as industrial and social life ramps up again.

5. IMPACT ON KGAL PORTFOLIO

Having said the above, we take comfort from several features of our own renewable portfolios managed: first and foremost, by far the largest part of the revenues of the projects we manage are contractually fixed, either under FiT systems or under private contracts and we have so far not received any indication on disruption of these contracts. This means, that the direct impact of the current market price development for electricity is very limited. Revenue shares of the single portfolios not being protected vary between 0% to 5% over the next five years, and of course the portfolios are ring-fenced from each other.

Second, the assets operate according to expectations. From today's perspective, there is no negative impact on technical availability or electrical generation identifiable. Of course, variations, for example for irradiation levels, occur but are well within the range typically seen in normal years for the current season.

Third, we do not see deterioration in the quality and availability of services of our O&M partners. Obligations are being fulfilled according to contract. Also, KGAL has a strong network of alternative service providers that we take comfort from in case a replacement of one single service provider becomes necessary.

Our portfolios are characterised by a certain degree of diversification, being of geographical, contractual or technical nature. This provides a certain protection on portfolio level in cases where, for example, a single region declares a complete halt regarding maintenance works on electricity generation assets, a persisting distortion in the supply chain of one specific OEM or in case of a collapse of a contractual counterparty as only a certain portion of the single portfolios will be affected.

Impact on KGALs portfolio very limited as projects and service providers operate within normal conditions

All projects currently under construction are on schedule or show delays that are still well within the time budgets factored into the initial project planning. The banking market remains open, but with a tendency for reduced risk appetite. We are in late stage negotiations on refinancing of portfolio assets with no indications given that banks want to pull out. Furthermore, purchase agreements for new assets were successfully executed over the last weeks.

In summary, the impact from the COVID-19 crisis so far has been limited on the asset portfolios managed by KGAL and we are confident that this can be maintained over the midterm. Nevertheless, in order to be prepared in case the situation changes, KGAL's infrastructure team is closely monitoring the market developments. The team are calculating the effect upon our portfolios for multiple adverse scenarios and stand ready to pro-actively implement solutions to future potential risks.

6. OUTLOOK

Unless COVID-19 throws us a nasty curve ball, its impact on the renewables industry at large and our portfolio in particular is still limited: however, the current pandemic will have a major impact on the way we work and live in general. This will in turn affect the energy market through changes in the quantity but also likely quality of energy provided.

While it is too early to draw any conclusions and long-term impact remains to be seen, it is our expectation that given the positive framework and support efforts that are being implemented, once the pandemic is under control, the economy and electricity consumption will recover quickly. This will be supported by the ramp-up of industrial production and private consumption.

For new projects, we expect equity and financing to be available and while there is still a fair amount of dry powder available for new projects, we may see a clearer differentiation of the cost of capital for projects depending upon their risk profile, both from an off-taker and a project cycle perspective.

Finally, an important factor to our outlook is the situation in the oil and gas market. Here, the combination of the coronavirus pandemic and the current savage price war has led that market into an unprecedented crisis with negative prices for one type of crude (Wyoming Asphalt Sour) for the first time in the industry's history. Can we envisage the possibility that the current situation may bring forward the timing of peak fossil fuel demand, which will in turn cause a stark change in our energy mix, in favor of renewables? Given current prices, most oil and gas projects do not cover their cost of capital. Even at \$35 a barrel, oil and gas projects' rates of returns have decreased from 20% down to 6%, which, combined with investor's drive to de-carbonate their portfolios, will make funding of these ventures even more difficult.

Alternatively, there is another scenario where lower fossil fuel prices make renewable energy sources less competitive and in turn harm the grid parity tendency of renewables.

Once we are in a position to assess the full impact of the coronavirus pandemic on our world and society, there will be an opportunity to revisit our energy choices and at that time, there is hope that that choice will be influenced by the silver lining of our current confinement: our cleaner air and clearer skies.

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KGAL Group

KGAL's investments in renewable energies focus on a diverse portfolio in the wind power, photovoltaics and hydropower sectors. Since the turn of the millennium, the company has invested in more than 130 assets across Europe with a total volume of approximately €2.8 billion. KGAL Group is a leading, independent investment and asset manager with an investment volume of around €20.5 billion. The investments focus on long-term capital investments for institutional and retail investors in the real estate, infrastructure and aviation asset classes.

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