



The growing role
of **PPAs** in
corporate **power**
purchasing



The state of cPPA play

“In 2021 alone, over 6 GW of contracts were announced”

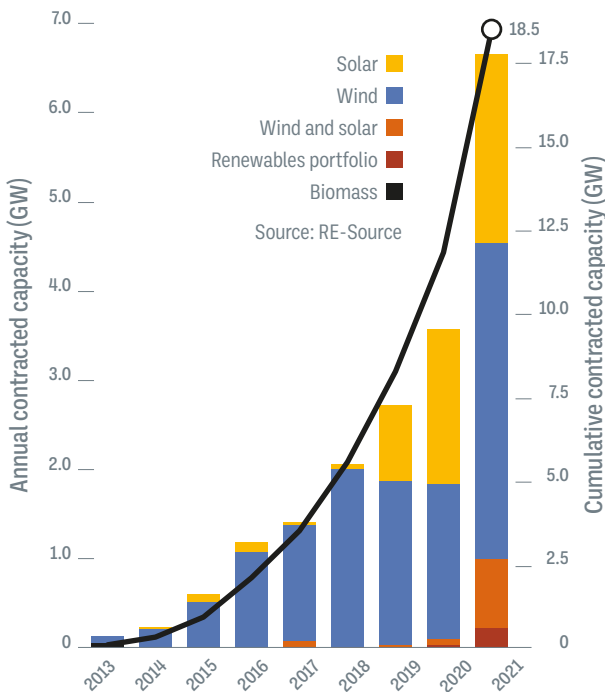
The market for corporate Power Purchase Agreements (cPPAs) in Europe is still a niche, but it is growing, and it is growing fast. On the purchasing side, corporations want to secure stable and predictable electricity prices under long-term contracts that also guarantee the electricity is produced by renewable sources. On the seller side, electricity producers are looking to lock in supply for several years ahead to shore up financing and make a convincing business case for new projects. Corporate PPAs can be negotiated directly between buyers and sellers but can also involve intermediaries.

Contracted capacity for cPPAs in Europe has grown from being virtually non-existent just a few years ago to around 17 GW today. Data from RE-Source, the European Platform for Corporate Renewable Energy Sourcing, shows that

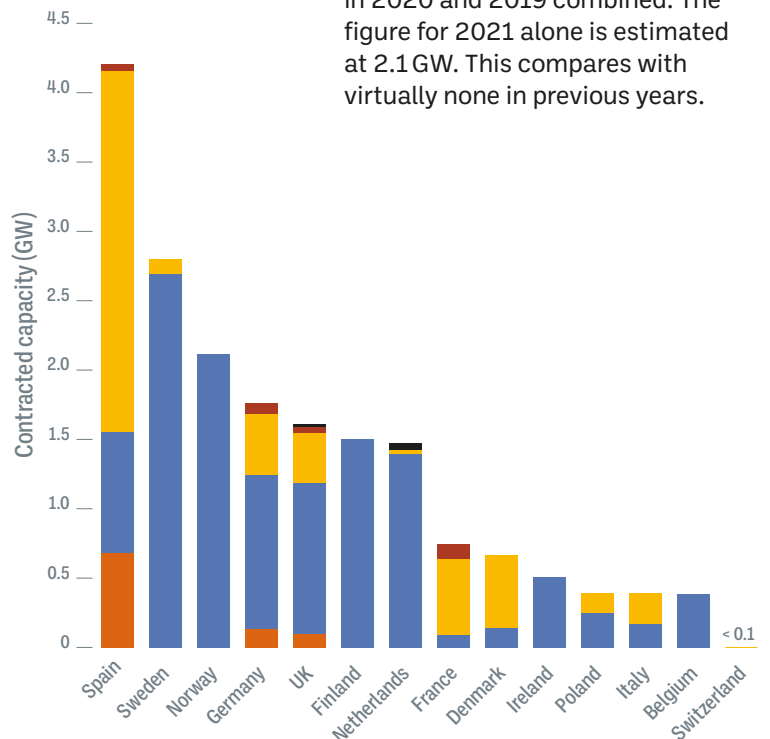
in 2021 alone, over 6 GW of contracts were announced of which 1.87 GW were linked to solar PV projects, 3.2 GW to wind power and 0.8 GW to combined wind and solar projects. Spain, Sweden, Norway, the UK, Germany, and the Netherlands are some of the countries where growth has been strongest.

“The market for PPAs has been growing quite massively over the last three years. In the EU, the renewable energy PPA market was non-existent only eight years ago,” said Miguel Herrero, Senior Policy Advisor at Solar Power Europe. “Now we are seeing annual growth of several gigawatts, with more than 6 GW growth this year – a third of the total contracted capacity in the EU. Europe and North America are the largest markets, but there are also smaller markets in about 50 countries around the world.”

PPA announcements



PPA by country



PPAs linked to solar PV projects are starting to catch up, with a total of 2.6 GW of such projects announced in 2020 and 2019 combined. The figure for 2021 alone is estimated at 2.1 GW. This compares with virtually none in previous years.

What has triggered this sudden interest in PPAs?

Corporate PPAs help to bring new renewable capacity online, channel private investment into new projects, and support EU climate and energy targets in a cost-effective manner, according to Joop Hazenberg, Impact Director at Re-Source.

“Importantly, corporate PPAs provide a meaningful form of revenue stabilization to renewable projects, unlocking project financing through long-term, stable pricing,” she said.

The spike in electricity and gas prices across Europe is a reminder that corporations are heavily exposed to fluctuations in market prices. In the UK, for example, several retailers have gone out of business and energy intensive industries such as steel makers have been struggling to pay bills or even been forced to suspend operations.

On the flip side, electricity producers are exposed to a downturn in wholesale market prices. In recent years there have been plenty of examples of periods with negative prices on European power exchanges when supply is ample, and demand is low.

Without PPAs, or other forms of support or offtake, renewables projects would be exposed to wholesale prices, meaning their cost of capital would be much higher, said Paul Marty, Senior Vice President at Moody’s Investors Service.

“PPAs support renewable expansion because they allow renewable developers to secure future revenue streams against which financing to build the assets can be raised. This means that the cost of financing, an important component of the leveled cost of renewables, is brought down.”

In many countries, illiquid wholesale power markets, with few participants and high barriers to trade, is a concern particularly on futures or forward markets. Spain is one example of this. The lack of a deep and liquid forward market enabling consumers to hedge several years ahead is one explanation as to why PPAs have shown strong growth in the country (see case study on Spain for more details on p.11).

“One of the risks that the buyer / counterparty of a PPA tries to cover is the price-risk, avoiding to acquire electricity at the volatile wholesale market price,” said Pilar Auguets, Senior Director, Head of Iberian Utilities at Fitch Ratings. “So, a not so robust forward wholesale market can explain the development and demand for longer-term PPAs.”

A diverse mix of corporations are betting on PPAs to lock in green electricity at predictable prices. This includes familiar faces such as Google, Amazon, and Meta (formerly Facebook), to name a few. In Europe, Amazon is the company with the most contracted PPAs, with 3.7 GW, followed by Google which has 1.7 GW of contracted capacity, according to RE-Source data. Norsk Hydro, the Norwegian aluminum company, is in third place with 1.5 GW of contracted capacity.

However, the demand for PPAs is growing across a wide range of industries.

“More and more players are entering the market, from large industries, pharmaceuticals, chemicals producers, retail, or the food industry. These industries are under pressure to decarbonize Scope 1, 2, and 3 emissions,” said Herrero.

“Industries are under pressure to decarbonize Scope 1, 2, and 3 emissions”

Miguel Herrero
Senior Policy Advisor at SolarPower Europe

Policy support is key to unlocking growth

Smaller firms are also increasingly turning to PPAs. SMEs, with fewer than 250 employees and a turnover of less than €50 million, represent 99% of all businesses in the EU, according to the European Commission. But one challenge is that many smaller firms may lack the resources and financial backing to enter into PPAs with producers. To this end, regulatory support at the EU and national level is key to accelerating their uptake.

The European Union's existing Renewable Energy Directive (RED II) calls on Member States to remove regulatory and administrative barriers to long-term PPAs. The Directive says Member States shall ensure that "those agreements are not subject to disproportionate or discriminatory procedures or charges."

The European Commission's proposals in the revised RED II, tabled in the Fit-for-55 package in July 2021, goes a step further by requiring Member States to "actively support" the uptake of PPAs.

Specifically, the revised RED II draft, which is currently under discussion in the European Parliament and Council of the EU, notes that the PPA market is still limited to a small number of EU Member States and large companies, "with significant administrative, technical and financial barriers remaining in large parts of the Union's market." To this end, the draft regulation says Member States should explore the use of credit guarantees to help smaller companies enter into PPAs. Government-backed credit guarantees reduce counterparty risk as they protect the seller of electricity from payment defaults.

"Member States shall assess the regulatory and administrative barriers to long-term renewables power purchase agreements, and shall remove unjustified barriers to, and promote the uptake of, such agreements, including by exploring how to reduce the financial risks associated with them, in particular by using credit guarantees," reads the draft.



The revised draft of the European Union's RED II, requires Member States to actively support the uptake of PPAs.

The draft bodes well for broader support for cPPAs at national level, not least for SMEs.

“SMEs may not always have the legal teams in place or the resources to carry out procurement, nor the credit rating to finance PPAs. They need a support framework,” said Herrero.

The EC said in its RePowerEU communication paper in March 2022 that it will, together with the European Investment Bank (EIB), offer more details on the financing mechanisms that would be best suited to promote PPAs by the end of the year. This will include facilitating better access to PPAs for new off-takers such as SMEs, it said.

A few European nations have already introduced, or are introducing, credit guarantees to support the uptake of cPPAs. In Norway, energy-intensive companies can benefit from a public guarantee scheme administered by Export Finance Norway. The Spanish govern-

ment also recently announced a financial support scheme for corporates that will include credit risk guarantees to help drive private investment through cPPAs.

A speedy roll-out of renewable projects is another prerequisite for cPPA growth. In many nations, however, red tape and bureaucracy represents hurdles for new projects. Re-Source’s Joop Hazenberg said concrete actions must be taken in many EU countries to ensure adequate renewable energy supply and remove administrative and regulatory barriers.

“For example, permitting and interconnection procedures continue to be one of the major barriers to the development of renewable projects in Europe. Procedures are too complex, too restrictive, too lengthy, and involve too many contact points,” she said.

“Permitting and interconnection procedures continue to be major barriers”

Joop Hazenberg

RE-Source

Statkraft will supply a total of 2.35 TWh of Norwegian hydropower to Wacker’s silicon metal Holla production site. Around 525 GWh of this will come from the Svean hydropower plant under a PPA.



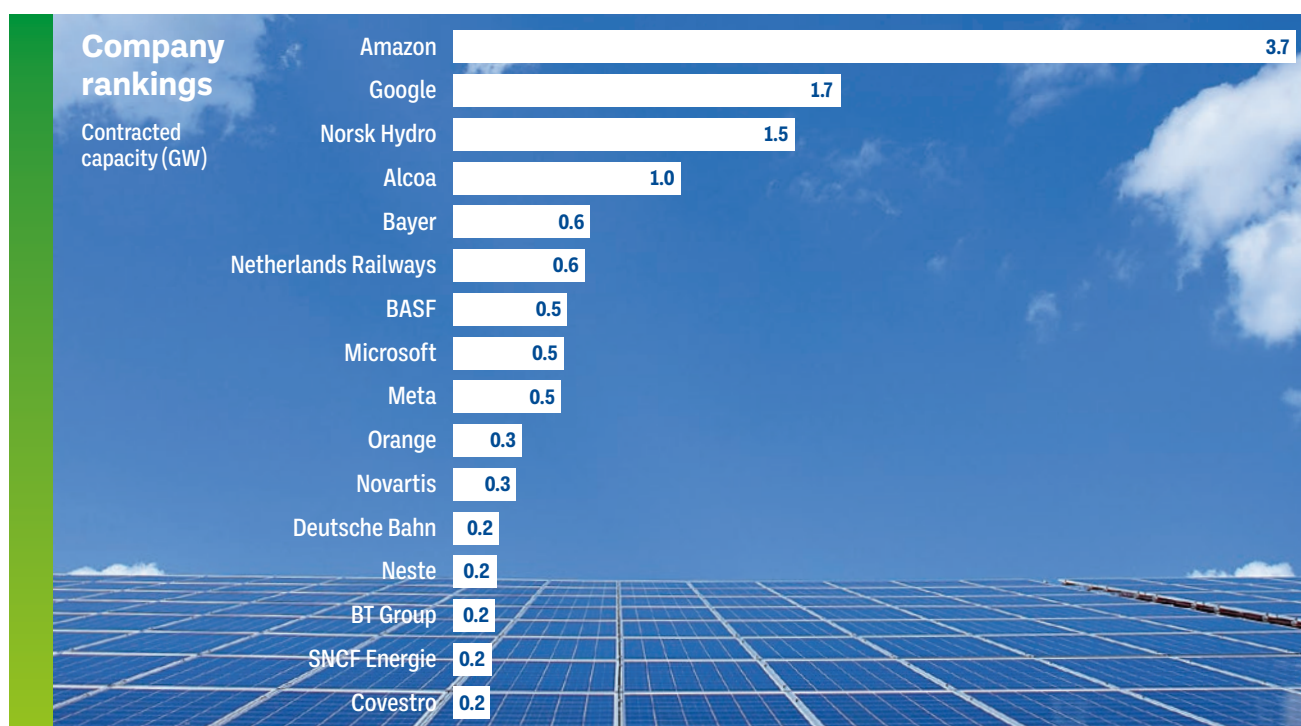
Big players lock in long-term agreements

Corporate PPAs typically have a duration of 10–25 years, offering long-term predictability to buyers and sellers. There are plenty of examples of recent agreements illustrating this. In late November 2021, French energy company Engie and German chemical company BASF signed an agreement with a duration of 25 years. Under the cPPA, which came into effect in January 2022, Engie will provide BASF with up to 20.7 terawatt hours of renewable electricity throughout the term of the agreement. The electricity will initially come from onshore wind farms in Spain.

The PPA fits in with BASF’s goal of reducing greenhouse gas (GHG) emissions by 25% by 2030, compared with 2018 levels, and to achieve net-zero emissions by 2050. Engie said it has already signed new cPPAs for a total volume of 1.9 GW since the beginning 2021, compared with 1.5 GW in the previous year.

Moreover, Spanish utility Iberdrola says it has signed cPPAs with a combined capacity of over 1.6 GW across a range of sectors including banking, telecommunications, the beer industry, distribution, sports, and pharmaceuticals. Iberdrola’s deal with Bayer in late 2020, for example, marked the first long-term agreement between a power corporation and a pharmaceutical company in Spain for purchasing clean electricity. Europe’s largest solar PV plant, the 590 MW Francisco Pizarro plant in Cáceres, Extremadura, will supply clean electricity to the nine Bayer sites in Spain for a 10-year period starting in 2022. This includes three factories, five research and development (R&D) centers and the company’s headquarters for Iberia.

In April 2022, Luxcara, one of the most experienced renewable energy asset managers in Europe, announced it had entered into three long-term PPAs with Meta, in Denmark. The projects total over 300 MWp of installed onsite capacity.



Risk factors

Corporate PPAs are not without risks. Project delays, under-performance in terms of generation output and force majeure, for example due to fire or flooding, are some of the risks that both buyers and sellers are exposed to. Sellers are also exposed to late payments, defaults, and cancellations from buyers. Merchant risk, for example if market spot prices fall well below the agreed price in the cPPA for long periods, is another factor to consider. Forecasting electricity prices is precarious of nature and cPPAs can be signed several years before a project is completed. Flexibility in contracts, in terms of frequent price and volume reviews, can mitigate risks but typically requires experienced contract negotiators.

“The use of PPAs will also depend on the appetite and willingness of large local electricity consumers to commit to buy electricity from renewable sources at a fixed price over many years,” said Moody’s Investors Service’s Paul Marty.

PPAs come in many shapes and forms and the lack of contract standardization is generally a challenge. Moreover, cPPAs can be both physical (direct) and financial (virtual). In virtual contracts, the offtaker does not take physical delivery of the power generated but enters into a Contract for Difference (CfD) with the producer which includes a reference or ‘strike price’. The producer pays the offtaker the difference if spot power market prices rise above the strike price. The offtaker pays the producer the difference if spot prices fall below the strike price. Although the offtaker does not take physical delivery of the green power, the company helps to finance the project by providing a predictable revenue stream for the producer.

“Flexibility in contracts in terms of frequent price and volume reviews can mitigate risks”



Onsite vs. offsite generation

“Onsite generation is relevant for PV projects that can be installed on rooftops or in car parks”

A major factor distinguishing PPAs, and corporate power purchasing is whether the electricity is generated on- or off-site. Benefits of onsite projects include optimization of available space, lower grid losses, and reduced need for grid expansion, as well as local job creation and increased energy security. Onsite generation is particularly relevant for PV projects which can, for example, be installed on rooftops and in car parks. Such PV projects can also be complemented by battery storage facilities. Another benefit is that electricity which is not consumed can be sold back to the grid.

Onsite generation is easier to implement if the buyer of the PPA is also the owner of the property, be it a factory, warehouse, office, or store; however, this is not always the case. Joeri Moons, Sustainable

Development Leader at sporting goods retailer Decathlon, told a Resource webinar in March 2021 that 60% of the company’s 2,700 warehouses and stores are under rental agreements which means the electricity contracts are in the hands of the landlords. For Decathlon, which aims to source 100% of its electricity from renewables by 2026, involving the landlords at the early stages of the onsite development and PPA negotiations is key, said Moons.

He continued: “We want to maximize the roof and parking space that we have within property sites and rental sites. A main way to achieve our target is to involve landlords in the beginning of the process and before we go to rent a certain area. Within Decathlon we are working on a decentralized strategy, because we want to

As part of the UP Initiative quarterly theme on sustainable electricity supply, **pv magazine** compiled a brief overview of the main models available and provided a more in-depth look into two of the most prominent: energy certificates and power purchase agreements. See the article and table, **Methods of green electricity procurement**, here:

<https://www.pv-magazine.com/magazine-archive/achieving-game-changing-growth/>



source the renewable energy as locally as possible.”

In some cases, the landlord is not interested in participating, said Moons, and Decathlon may propose to purchase ownership of the roof or parking lot and then carry out the onsite installations and investment. In other cases, landlords are very well informed about the potential for green electricity and want to go even further than the original plans, for example by insisting on installing battery storage facilities to complement rooftop solar.

“Sometimes we see that landlords are even more advanced than we are and are really thinking together with us to achieve our renewable energy target,” said Moons.

Harald Overholm, CEO of Alight, a Swedish company specializing in

PPAs which builds, operates, and owns onsite and offsite solar projects, told the same webinar that customers were generally worried about the general “hassle” of evaluating technical, financial, and environmental standards for onsite projects. Lack of in-house competence and experience is also an obstacle, he said. Additionally, the high number of stakeholders involved in the evaluation process, including site managers, corporate HQs, real estate owners, and consultants, complicates matters further.

“This market is growing fast, but I think anyone who’s been in it for a while will also agree that, you know, let’s look at why it is not growing faster because there is so much more left to be done,” Overholm said.

A roll back of renewable subsidy schemes across Europe, sometimes with retroactive effect, has supported the growth of PPAs. An increasing number of projects are subsidy free, which means they are not dependent on feed-in tariffs or other types of direct financial support from the government.

To this end, Overholm said his company, which was founded in 2013, had been inspired by the US market where PPA growth has happened at a large scale.

“There is only one way that solar can be subsidy free and that is if somebody else than the government pays for it. That is what PPAs are about, it is about helping power users to pay for solar in order to build more solar,” Overholm said.



Guarantees of Origin (GOs) bundle nicely with PPAs

“Member states should be required to time-stamp GOs”
Joop Hazenberg
RE-Source

Further development of the still nascent Guarantees of Origin (GOs) market is critical to support the growth of cPPAs. In short, GOs enable electricity buyers to document that their purchased electricity is green, for example that it is produced by solar PV. The GO market in Europe is in the relatively early stages, with little transparency and limited demand which in return is reflected in low prices. But, as it enables corporations to “prove” that the electricity purchased is green, or so-called “labeling” for Environmental, Social and Corporate governance (ESG) purposes, the GO market has significant growth potential.

“GOs are designed to trace renewable electricity production and consumption across the power system,” said Joop Hazenberg of Re-Source. “They are critical for businesses to demonstrating and reporting the use of renewable electricity. And increasingly, companies are seeking more detailed information from GOs on the origin of their electricity.”

GOs can be traded as certificates separately from the electricity produced – or unbundled – in lots of 1 MWh. The corporation then effectively buys documentation that 1 MWh of the electricity consumed was produced by renewable electricity. The corporation may then purchase as many GO certificates as necessary to meet its decarbonization targets.

GOs may also be sold bundled with long-term PPAs. This will likely be the preferred option for many corporations in the future as it simplifies the procedure compared with buying power and GOs separately. It further improves transparency by enabling the buyer to trace back the GOs to specific renewable generation assets.

Member states are, under existing EU law, obliged to have a scheme in place for GOs. The existing RED II stipulates that Member States “should ensure” that GOs are issued for all units of renewable energy produced, but they can decide not to issue them to producers that also receive financial support through support schemes such as FITs and feed-in premiums (FIPs). In the revised RED II, the EC goes a step further by proposing the requirement that GOs must be issued to all renewable electricity producers, also those that already receive financial support.

Hazenberg said the latter requirement is crucial but noted that the EC’s proposal stops short of improving the transparency and granularity of the GO framework, which would enable more accurate matching of renewable energy supply and demand and allow renewable suppliers to better market their electricity.

“Member States should be required to time-stamp GOs in order to know the precise time at which the underlying unit of energy was produced,” she said. “Time-stamping should be provided at a more granular level than simply annually or monthly. The current RED allows issuing bodies to define GO production periods, and most use annual or monthly periods – not the day, hour, or 15-minute balancing period.”

Moreover, the standard size of 1 MWh for GOs poses challenges for smaller buyers pursuing more granular hourly or sub-hourly matching strategies. To this end, RE-Source has called for further review of Article 19.2 of RED II to ensure GOs can be issued in increments smaller than 1 MWh.

Case study:

Spain leads the way on PPAs

Spain is the top performer in Europe's nascent but fast-growing cPPA market. This is due to several factors including an abundance of renewable resources, both for solar and wind, political support, and the fact that cPPAs offer an alternative to hedging on the relatively illiquid Spanish market for power futures and forward contracts.

"Spain is attractive for PPAs because of the large gap between the wholesale power price and the levelized cost of renewables, which itself is due to abundant renewable resources," said Paul Marty, Senior Vice President at Moody's Investors Service. "The lower the levelized cost of renewables relative to the market price, the greater the incentive for off-takers to enter into a contract to buy power over a medium to long term horizon."

PPAs did not begin to gain traction in Spain before 2017. But the country now boasts around 4.2 GW of contracted capacity of which 2.6 GW is solar, according to RE-Source data. Growth is expected to accelerate in the coming years.

Spain's National Integrated Energy and Climate Plan (NIECP) for the period 2021–2030 submitted to the EC includes a target of building about 60 GW of new renewable capacity in the next 10 years in, or almost 6 GW on average per year. This comes as Spain progressively phases out its coal plants, possibly by around 2025, and nuclear plants by 2035. Nevertheless, the renewables target is ambitious especially when compared with the average commissioning rate of below 4 GW in 2018–2020, said Pilar Auguets, Senior Director, Head of Iberian Utilities at Fitch Ratings.

She noted that only about one third of the targeted renewables capacity between 2021–30 is initially expected to be installed with the support of renewables auctions, while the rest will benefit from other financial instruments. That includes investment aid from the European Regional Development Fund and long-term PPAs – the latter to cover merchant risk and attract funding from banks to develop projects.

"Consequently, we expect the market for PPAs to develop significantly in Spain over the next 10 years driven by the strong supply of new projects, but also the boost in private demand as preference for green energy increases," she said.

The Spanish government approved in December 2020 a financial guarantee scheme to support electro intensive industries signing PPAs. The government has initially allocated €600 million to the fund for a three-year period. The scheme protects power suppliers in case offtakers default on payments. This is in exchange for the companies' commitment to sign a minimum five-year PPA for at least 10% of their annual energy consumption.

The scheme tackles counterparty risk which is key as the number of counterparties with high credit ratings in Spain is relatively limited.

"In our view, this measure could support the growth of corporate PPAs in Spain and drive their prices down as the cost of the financial guarantees is supported by the state," said Auguets.

"Spain is attractive because of the large gap between wholesale power prices and the LCOE of renewables"

Paul Marty

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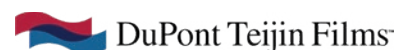
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