

OPENING

NEW HORIZONS



ANNUAL REPORT 2019

» epexspot

OPENING OUR
MIND



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THE PAST YEAR HAS BEEN A PIVOTAL ONE FOR EPEX SPOT. AS WE CELEBRATED OUR TENTH ANNIVERSARY, WE NOT ONLY LOOKED BACK ON OUR PAST ACHIEVEMENTS, BUT WE LAID THE FOUNDATIONS FOR THE DEVELOPMENTS AHEAD.



Our core markets are the backbone of our business, and the annual trading volume reached a new record again, for the fourth year in a row. We further diversified our product suite, with the introduction of new Intraday auctions, and broke new ground for our services.

Looking back on the achievements of the past decade, during the celebrations of our *10 years of power*, also brought up the obligatory contemplation: what lies ahead of us? 2019 was a true turning point on all fronts.

Opening our mind. We continued to redefine our role within the ever-changing energy industry, to further drive forward the decarbonisation, digitalisation and decentralisation of the sector. Our joint fight against climate change brings new responsibilities for all actors. We have taken up ours and continue to make our markets fit for renewables while innovating to create markets that are inclusive of new energy actors, new technologies and new business models.

Opening our means. Embarking on a transformative journey like this requires investments. Our business, our tools and our expertise grow with our challenges. We continue to invest in our systems and we think outside the box when it comes to the ways we want to make our price signal available to new players.

Opening our fields. This means bringing our expertise to new territory. In 2019 we entered the field of balancing services for the first time in our company history. EPEX SPOT also continues to be a reliable partner in projects on a European scale, cooperating with various actors to bring the European power sector closer together.

The past year has also brought a major challenge to our company, which was the technical incident leading to the decoupling of several of our markets in June. It is crucial that we grow from such experiences. Not only on an organisational level but including all processes and instances of the European Market Coupling. Everything we take away from such a crisis makes us more resilient as an energy community.

This has proven true, unfortunately, quicker than anticipated: as I am writing these words, the world is being rattled by the Covid-19 pandemic. The organisational setup of our company allowed us to quickly respond to the crisis and to secure the operations of Europe's wholesale markets in a reliable manner. While I am confident that the energy community will come out of this crisis stronger, even more aware of its responsibility towards society, it is also a time where a look into the possibilities of the future can keep our spirits up.

I look forward to what is to come, to opening new horizons together with our teams, our customers and business partners.

"While I am confident that the energy community will come out of this crisis stronger, even more aware of its responsibility towards society, it is also a time where a look into the possibilities of the future can keep our spirits up."



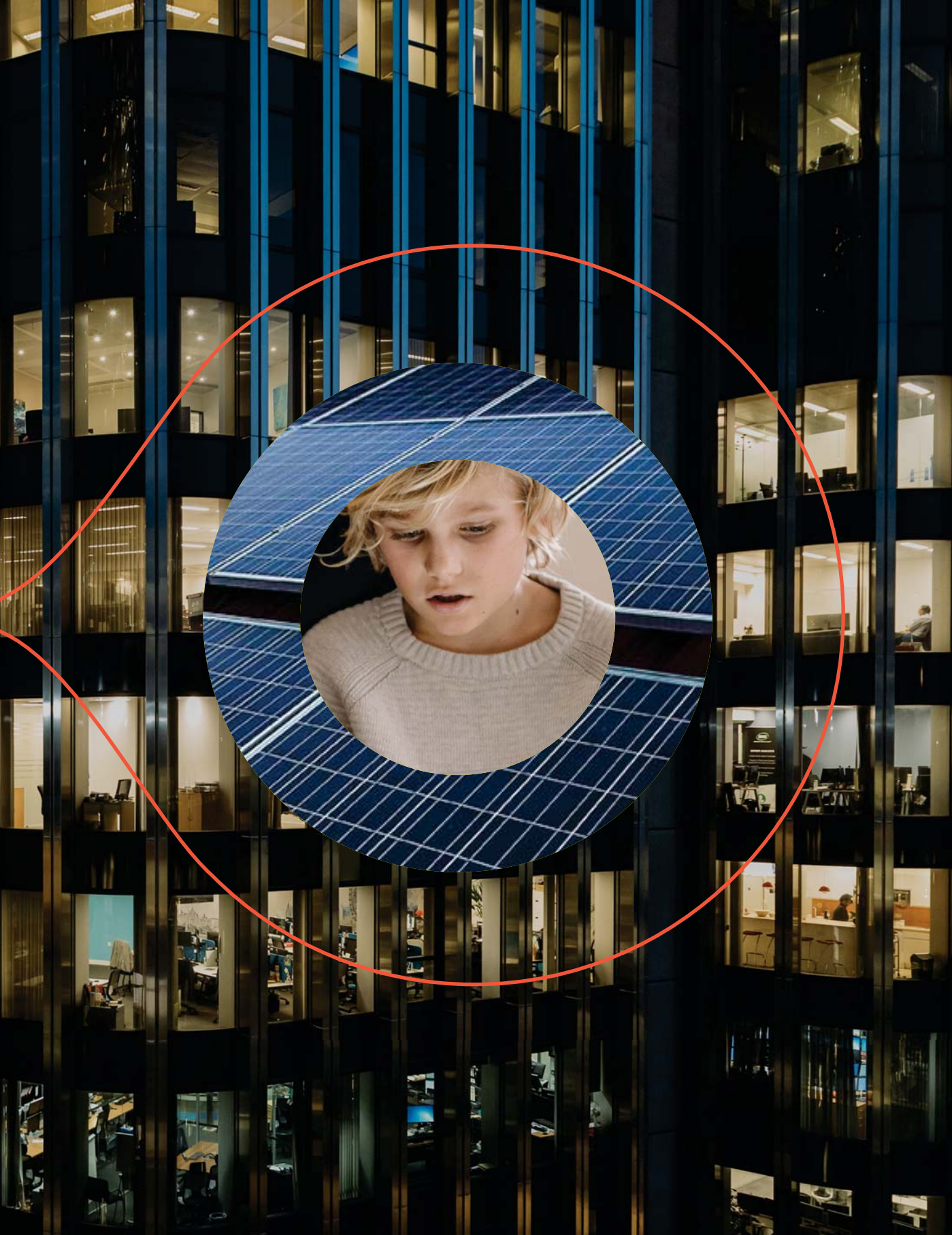
**RALPH
DANIELSKI**

CHAIRMAN OF THE MANAGEMENT BOARD
AND CHIEF EXECUTIVE OFFICER OF EPEX SPOT



OPENING OUR

MINDS





***IN 2019 WE HAVE
CELEBRATED
10 YEARS OF POWER,
OUR TENTH
ANNIVERSARY SINCE
THE FIRST TRADE
ON THE EUROPEAN
POWER EXCHANGE
IN 2009.***



As the Power Exchange for Europe, there are three foundations to our activity that have been cemented over the past decade.

WE GIVE VALUE TO POWER

We give value to electricity by delivering a reliable and transparent price for electricity for every hour of the day and every day of the year. All short-term decisions –what power plant should be ramped up or down?– and long term decisions –what technology should be invested in to remain economically sustainable?– are based on the electricity prices delivered by EPEX SPOT.

But we also bring value to the power sector: by organising markets we absorb complexity, an intricate economic situation is aggregated to a simple market price which contains all the relevant information. We enable trading between hundreds of actors making thousands of transactions, a process that is technically complex and requires a high level of technical skill, expertise and trusted systems.

WE HAVE BUILT A COMMUNITY

As a Power Exchange, our role is comparable to that of a neutral community manager. We have built a true community of customers and we form an essential link with the rest of the power community.

Other actors of the power sector rely on our price signal, on our expertise to contribute to the policy making process, they rely on us as a partner in Market Coupling, as their service provider, as their source for market data and insights. We continuously listen to and meet the needs of our community to shape the future of European power markets together.

WE ARE PART OF EEX GROUP

EEX Group provides market platforms for energy and commodity products across the globe and gives access to a network of more than 650 trading participants. Based in 17 worldwide locations, it offers trading across various commodities such as power, natural gas, environmental products, freight, metals and agriculturals. As part of EEX Group, EPEX SPOT can offer unique cross-selling synergies to trading members as well as access to unmatched expertise across commodities and markets.

PART OF EEX GROUP BASED IN



WORLDWIDE LOCATIONS

THE EPEX SPOT MANAGEMENT BOARD



**RALPH
DANIELSKI**

CHIEF EXECUTIVE OFFICER



**JONAS
TÖRNQUIST**

CHIEF OPERATING OFFICER



**THIERRY
CAROL**

CHIEF FINANCIAL OFFICER

MICRO LOCAL MARKET



In today's decentralised and digitalised world, renewable energies are accessible to everyone. Energy communities emerge in neighbourhoods and businesses become energy self-sufficient, covering a maximum of their electricity consumption with their own production.

Connecting these microlocal energy communities to our wholesale markets allows prosumers to value their electricity and to adjust production and consumption behavior according to the market price. It's a win-win situation for both; prosumers who get an added economic value for their electricity, and market participants, who have increased trading opportunities.

LOCAL FLEXIBILITY MARKET



Geographical areas with high renewable generation often experience grid congestions. The abrupt increase of electricity feed-in due to high winds or sun exposure creates a bottleneck on the grid, which has to be solved through costly measures. Our Local Flexibility markets efficiently handle congestions before they occur by incentivizing actors to buy or sell flexibility that triggers additional electricity to be added or removed from the grid.

WHOLESALE MARKET



The wholesale market relies on large bidding zones to create a reliable and transparent price signal for electricity in Europe. A maximum of liquidity is pooled in all market areas and electricity flows according to the price signal, from the cheaper to the more expensive region. This way, interconnectors are used efficiently, price peaks are attenuated and security of supply is secured.

ENERA

A PILOT PROJECT TAKES OFF

IN FEBRUARY 2019, THE PROJECT PARTNERS OF THE ENERA MARKET ANNOUNCED THE SUCCESSFUL LAUNCH OF THE FIRST LOCAL FLEXIBILITY MARKET IN THE WINDY NORTH-WEST OF GERMANY. ENERA IS A MARKET-BASED SOLUTION TO TACKLE GRID CONGESTIONS. EWE AND EPEX SPOT LAUNCHED THE ENERA MARKET WITH AVACON NETZ, EWE NETZ, AND TENNET.

FIRST TRADE

2_{MW}

TRADED AT

-45.50€/MWH

ON 4 FEBRUARY 2019

WHAT INSPIRES US?

THREE MEGATRENDS FORGE A NEW ENERGY LANDSCAPE

The energy world has been held in the grip of three megatrends, the so-called 3Ds, which have profoundly transformed the sector and continue to do so.

Decarbonisation, the first of the first of the 3Ds, has become the main pillar of Europe's fight against climate change. By decarbonising various sectors, the European Union plans to be carbon neutral by 2050. The energy sector is at the forefront of this battle with a special focus on electricity generation, which historically heavily relied on conventional power plants, such as coal-fired or nuclear plants.

The answer of the electricity sector to this challenge are renewable energies, meaning sources of energy that are not depleted by use, such as water, wind, or solar power. These power generation assets are set up with many distributed small units rather than one large central unit, as it is the case for conventional power generation. This leads to the second megatrend, **decentralisation**.

In parallel to this, technology has evolved quickly, paving the way for digitalisation to transform our every-day lives. **Digitalisation** is more than just a technical evolution, it's rather an industrial and social revolution driven by businesses and citizens. The possibilities to use technology to change the way we live, work and communicate with each other seem endless. This is also true for the electricity sector, the way we steer our electricity use, the emergence of new business models and the extremely quick pace of innovation in the energy world.



THE POWER MARKET

› epexspot

IMPLEMENTS NEW
MARKET MODELS



DECENTRALISATION

LOCAL FLEXIBILITY MARKETS
MICROGRIDS AND THE
WHOLESALE MARKET

PROVIDES
ENVIRONMENT
FOR ALGO TRADING



DIGITALISATION

APPLICATION PROGRAMMING
INTERFACES (APIS)
PARTNERSHIPS WITH
INDEPENDANT SOFTWARE
VENDORS (ISV'S)

INTEGRATES
RENEWABLES



DECARBONISATION

FLEXIBILITY CONTRACTS
REAL-TIME TRADING



THE MARKET - CENTRAL PILLAR OF A DECARBONISED, DECENTRALISED AND DIGITALISED ENERGY WORLD

The role of the power market evolves in light of the 3D trends. The most important task of the power market is to efficiently integrate renewables. Because what good does renewable energy do if it doesn't reach the end consumer? EPEX SPOT has been a pioneer in this field. We introduced our first flexibility products already in 2014 and over the years they have become a cornerstone of **decarbonisation**. Flexibility products allow market participants to trade electricity in smaller bundles than the usual 60-minute products. In continuous Intraday trading, EPEX SPOT offers 15 minute or 30 minute continuous contracts in seven market areas, complemented by Intraday auctions in three countries –with more to come. In Germany, where net electricity generation of renewables has surpassed fossil generation for the first time in 2019, over 25% of Intraday volumes are traded on 15 minute contracts.





- On our Intraday markets, electricity is traded continuously and up to 0 minutes before delivery, to allow for last-minute corrections in case of changing weather or consumption conditions.

The **decentralised** setup of an energy sector in transition requires new market models. The wholesale market which is highly liquid and covers large bidding zones will be complemented by smaller local markets. The price signal provided by the wholesale market used to be exclusive in use to utilities, suppliers, industrial consumers, trading companies, system operators and aggregators -all actors trading on the wholesale market. With prosumers on the rise, forming small energy communities, a reliable and transparent price signal is needed to provide the missing impetus that allows the new setup to evolve in an economically sustainable direction. The Power Exchange as a neutral actor brings the expertise to provide such a price signal.

Last but not least, EPEX SPOT provides an adequate environment for our highly **digitalised** customers to make the best of their trading experience on our markets. Our systems have to be stable and reliable to host digitalised trading activity, also referred to as algo trading.

More information on algo trading on page 16.

YOU SPEAK

**FOR THE 12TH TIME,
WE HAVE CONDUCTED
A DETAILED CUSTOMER
SURVEY AT THE
END OF THE YEAR
TO GAIN INSIGHTS
INTO THE WAY OUR
MEMBERS PERCEIVE
OUR SERVICES, OUR
OFFER AND THE TOOLS
WE PUT AT THEIR
DISPOSAL.**

A record 160 companies have replied –over 50% of our market participants– with general satisfaction largely maintained at 87% despite the challenges we faced throughout 2019. This high engagement is not only important in terms of representativeness of the feedback received but also illustrates that EPEX SPOT's activity is not a one-way street.

We were able to derive three major topics that are being addressed in the upcoming months: first and foremost, continuing to implement a series of improvements on the M7 system, increasing the number of webinars and topics covered from new products and system functionalities to safety and compliance, and last but not least, sharpening the priorities of projects and products to be delivered in the course of the year to best reflect our member's needs.

**WE
LISTEN**

RENEWING OUR MISSION

LESSONS LEARNED FROM THE DECOUPLING

In June 2019 EPEX SPOT experienced a technical issue on the Day-Ahead markets which lead to a partial decoupling of the Multi-Regional Coupling (MRC). The root cause of the technical issue was an unsupported order that was entered into the ETS system, causing two consecutive server locks. When the system was up and running again, the deadline for the Market Coupling processes, according to the Price Coupling of Regions, had been reached. The Austrian, Belgian, Dutch, French, German and British Day-Ahead markets were decoupled from MRC.

After further technical issues on the local markets, EPEX SPOT was able to publish firm market results at 15h38 CET. All nominations and payments were completed and settled correctly.

Even though detailed processes are in place for all types of decoupling scenarios, all actors were strongly impacted by this incident, revealing insecurities concerning fallback procedures.

Since then, EPEX SPOT has instigated several dedicated tests and simulations for EPEX SPOT members, to rehearse different scenarios. We have organised a dedicated webinar to present and review the Coupling processes with market participants, collected feedback from trading members and used it to review communication channels and market messages, in order to bring a new level of clarity and guidance to market participants. In addition to this, EPEX SPOT, along with the other involved partners, plays an active role in the different European Market Coupling instances to drive forward the improvement of processes, timings and market messages.

Such incidents are and remain extremely rare, but being prepared is key to secure an orderly market with reliable results.

A photograph of a rooftop solar farm. The foreground shows rows of solar panels, some of which are covered with a dark, textured material. The background features a dense urban skyline with various high-rise buildings under a hazy, orange-tinted sky, suggesting a sunset or sunrise. The image is framed by decorative orange wavy lines.

OPENING OUR

WEEKENDS



THE FUTURE STARTED YESTERDAY



**ALGORITHMIC TRADING,
AUTOMATED TRADING,
ALGO TRADING,
ROBOT TRADING,
API TRADING...
THERE ARE MANY TERMS
USED TO REFER TO THIS
UNSTOPPABLE TREND
ON THE POWER MARKET.**

WHAT IS ALGORITHMIC TRADING?

Algorithmic trading essentially describes one thing: a computer is programmed to automatically submit and execute an order, with limited or no human intervention. Put in the global context of the energy sector, however, there is way more to automated trading and its fast spread in the trading community. But let's start from the beginning.

THE 3D TRENDS

Decarbonisation, the rise of renewables, leads to decentralisation, meaning more and more small installed units complement large power plants. Both trends are furthermore driven by digitalisation, enabling innovation and new business models.

The Power Exchange provides the technical environment that allows new trading trends, such as algorithmic trading, to thrive.



API – APPLICATION PROGRAMMING INTERFACE

While all our markets are equipped for algorithmic trading, it plays a particularly important role on the Intraday market. The Intraday market provides flexibility with 15 minute and 30 minute contracts that enable traders to balance their portfolios within an hour, in line with renewable production. Last-minute adjustments can be made up to 0 min before delivery.

Every trading desk has its strategy to optimally use the opportunities provided on the market. To translate this strategy into market activity, they can either trade manually or with an **Automated Programming Interface (API)**. APIs are either provided by an **Independent Software Vendor (ISV)**, developed in-house by our customers or provided by EPEX SPOT directly.

APIs work 24/7, with very limited human interference and are scalable and resilient. They allow for extremely fast reactions because they automatically manage the complexity of fundamentals like changing weather conditions, available generation capacities and market developments such as volatility.

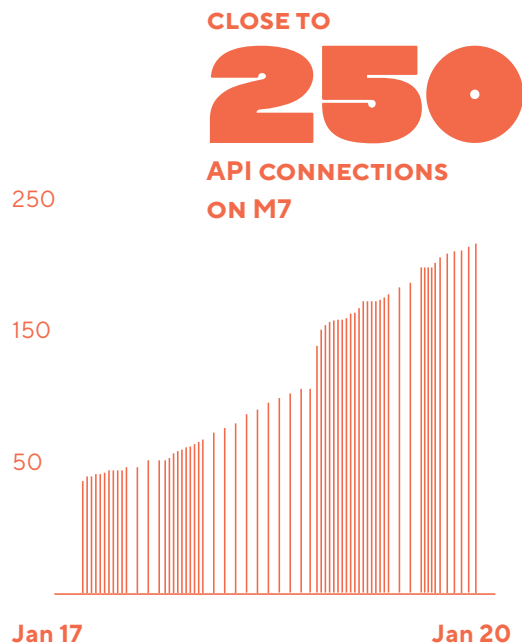
47%

OF TRADED VOLUME
COMES FROM APIS

65%

OF THE NUMBER OF
TRADES COMES FROM APIS





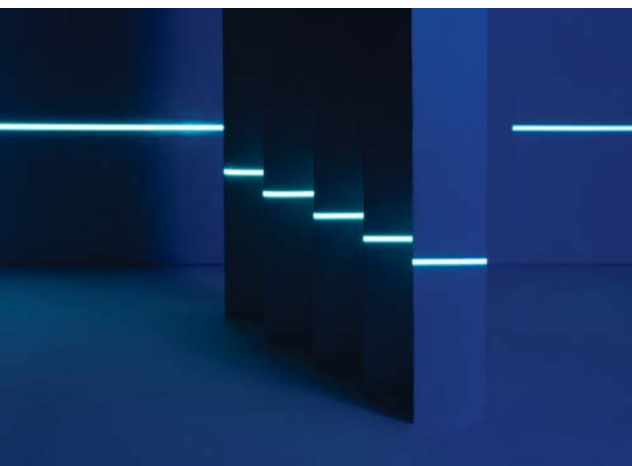
High-frequency trading is a specific subset of algorithmic trading where a trading system analyses data or signals from the market at high speed and then sends or updates large numbers of orders within a very short period.

All APIs available on the EPEX SPOT markets have been put to the test of strict implementation principles and are certified by us to guarantee their safety and the best experience for the market.

SPEED AND PERFORMANCE - EVERY MILLISECOND COUNTS

With the automation of trading via APIs, every millisecond counts. The factors speed and data volume become crucial and translate into an increased load on EPEX SPOT side. This means that the trading systems, and the Intraday system M7 in particular, have to cope with a steeply increasing amount of activity. To prepare the M7 system for such load levels, EPEX SPOT has been heavily investing in this system for years: today, over 200 APIs are connected to the Exchange, with 40% following market developments using this technology, and 60% implementing their automated trading strategies.

In an increasingly automated world of trading, where speed and ability to handle high load is crucial, the statistics show that M7 is the most performant Intraday trading system in Europe.




AVERAGE

1,242,762

MAXIMUM

1,393,800

M7 orders per day



TOMORROW

ARTIFICIAL INTELLIGENCE

For years software specialists have been working on the next big step in the field, which is the involvement of Artificial Intelligence. This opens the possibility to programme software to achieve not only a certain goal, such as profit maximisation but to learn how to achieve this goal. The software acquires knowledge through training and trial-and-error explorations, it maps complex inputs and is eventually able to plan ahead, to predict and execute the optimal actions needed to achieve the goals that have been set. Exciting times lie ahead of us!

THE MAIN ADVANTAGES OF ALGORITHMIC TRADING

SPEED

Algorithms are written beforehand and the set of instructions are executed automatically. This provides much better trading opportunities than the manual alternative.

COST REDUCTION

Algorithms do not need constant human supervision. There is, however, necessity to control the behaviour in real time.

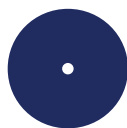
ACCURACY

Typing mistakes and human errors are reduced.

PRICES

MATTER AT ALL LEVELS

**WITH THE RISE
OF THE FLEXIBLE
POWER SYSTEM,
NEW TERRITORY
EMERGES FOR THE
PRICE SIGNAL AND
ITS ROLE.**



Over the past years, EPEX SPOT has been working on different projects, with a variety of partners, to bring the benefits of a transparent and reliable price signal to new actors of the power system.

The decarbonisation of the energy system has important consequences for the electricity grid, which was originally built for individual large production plants. With the spread of decentralised renewable energy plants – often far away from the centres of consumption – the grid is under pressure. Decentralised consumption and production models are on the rise and we have entered a new era of flexibility, with prosumers, home storage and local electricity

generation widely established. The current market design, however, does not yet efficiently integrate this flexibility to use it to relieve the grid. This is about to change.

If we want to enable existing flexibility to unfold its full potential, we need incentives for users to decide if, when and where to use it. Flexibility needs a value. Without value, there is no information about when and where flexibility is needed, and no incentive to create new flexibility.

THE MARKET PRICE SIGNAL – ALL AVAILABLE INFORMATION BOILED DOWN TO SEVERAL DIGITS

This is where the price signal comes into play. A reliable price signal is created by supply and demand in a market. Nothing breaks down the complexity of an economic situation as simply and as efficiently as a price signal. The market price is never random and always reflects an actual market situation so that resources can be used optimally. The price signal carries information on the electricity sector as a whole.

At EPEX SPOT we develop ways of bringing the benefits of the price signal to all levels of the power system, down to the prosumer. It is the very expertise we have as a Power Exchange that qualifies us for this. As a neutral market operator, EPEX SPOT provides a price signal that is transparent and reliable.

Flexibility needs a value. Without value, there is no information about when and where flexibility is needed, and no incentive to create new flexibility.

COMBINED EXPERTISE FOR MARKET-BASED SECTOR INTEGRATION

In 2019 we combined our expertise with Siemens CT, to further open up our markets to decentralised market players, down to the level of a single building. This joint economic reflection has been outlined in a white paper.

By connecting the Building Energy Management System and its optimisation algorithm, developed by Siemens, to the flexibility and wholesale markets of EPEX SPOT, a price signal will be made available to all levels of the value chain. The price signal determines the value of a certain asset or activity at a certain point in time. In a decentralised energy system, the price signal is the missing link between the levels to provide concrete incentives as to which flexibility sources are to be activated and when.

Instead of considering each element of the energy system individually, the holistic approach of sector coupling using renewable energies helps to decarbonise all sectors of the economy.

By enabling the market participants to value their flexibility not only within but across these levels, Siemens and EPEX SPOT aim at unlocking the full flexibility potential of decentralised assets to achieve a market-based sector integration.

[See schema on the next page.](#)

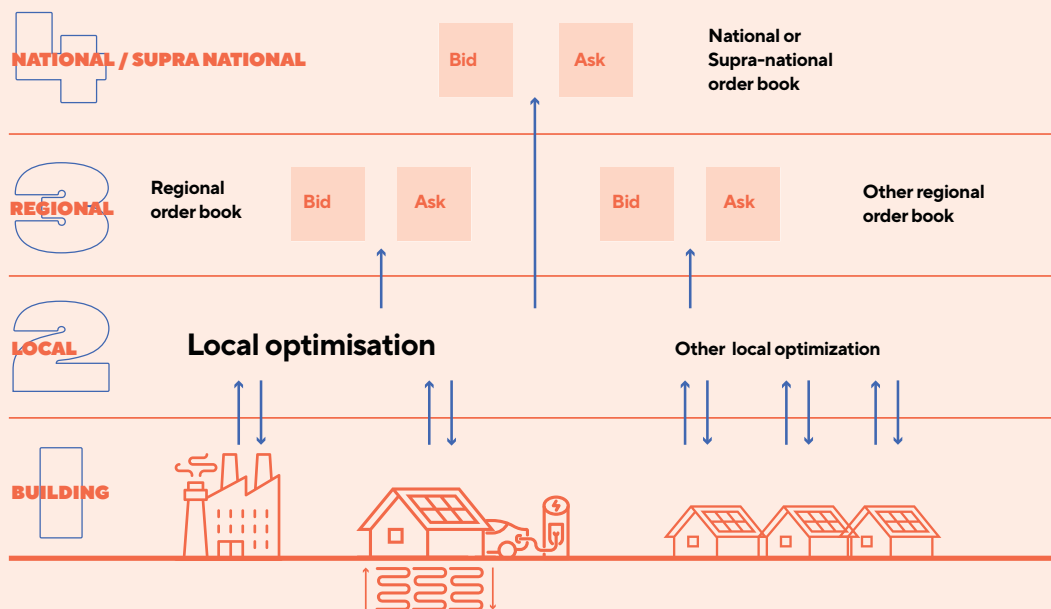
“As a vendor, we want to help grow market potential for EPEX SPOT by facilitating access. With innovative technology, even individual factories and buildings can be connected. Such symbiosis between markets and physical multimodal coupling can provide the flexibility needed to integrate an ever-increasing amount of renewables, heat pumps and e-cars.”



**STEFAN
NIESEN**

HEAD OF TECHNOLOGY FIELD ENERGY SYSTEMS
AT SIEMENS CORPORATE TECHNOLOGY

TAKING MARKETS TO ALL LEVELS



FOUR LEVELS IN THE ELECTRICAL SYSTEM ARE CONCERNED

LEVEL 1

Within a building or site. Buildings are more and more equipped to self-supply their electricity needs and even store power for future use. Energy Management Systems for buildings combine these assets with data on forecast and energy use, on a building level. The Building Energy Management System developed by Siemens can interact with such equipped buildings to achieve optimisation, in order to generate additional revenues for the owner.

LEVEL 2

Within a local distribution area, such as a village, smaller city or a city district.

The system automatically generates offers to other buildings and market participants expressing the willingness to buy, sell or give access to flexibility. This flexibility can then be made available locally to other participants, covering areas such as villages or city districts. The role of the optimisation is to aggregate individual offers through peer-to-peer transactions and to offer the remaining flexibility or overload (excess supply or additional consumption needs) on the regional or the wholesale market.

LEVEL 3

Within a region encompassing larger cities.

On a regional distribution area, flexibility can be valued on flexibility markets operated by EPEX SPOT. They are complementary to the wholesale and balancing markets.

LEVEL 4

National or even transnational areas.

If there are no grid constraints, participants can also value their flexibility or procure with their overload directly on the wholesale market, which covers national and trans-national areas.

BY ENABLING THE MARKET PARTICIPANTS TO VALUE THEIR FLEXIBILITY NOT ONLY WITHIN BUT ACROSS THESE LEVELS, IT WILL BE POSSIBLE TO UNLOCK THE FULL FLEXIBILITY POTENTIAL OF DECENTRALISED ASSETS TO ACHIEVE A MARKET-BASED SECTOR INTEGRATION.

WATCHFUL EYES ON EVERY ORDER

THE TREND OF ALGORITHMIC TRADING HAS A DIRECT IMPACT ON THE WORK OF OUR MARKET SURVEILLANCE TEAM.

The Market Surveillance office is an independent exchange body that directly reports to the EPEX SPOT Management Board as well as to the Exchange Council. The way it operates is unique in Europe. By continuously **monitoring** all market activity, the office ensures orderly trading, a fair market price and that trading members comply with the European transparency regulation REMIT, the EPEX SPOT Market Rules and the Code of Conduct at all times. Upon detection of a suspected abuse or breach, the office conducts an investigation and promptly notifies EPEX SPOT in case of substantiated suspicion. EPEX SPOT may additionally decide on a sanctioning procedure, e.g. suspension of membership. In addition to this, the office closely cooperates with and reports suspected breaches of REMIT to relevant regulatory authorities.

Our Market Surveillance team works with state of the art tools and its processes take into account all trading and market trends, such as algorithmic trading.

STAYING ON TOP OF THE DATA IN A HIGHLY DYNAMIC MARKET

Algorithmic trading significantly increases the number of orders submitted as well as the complexity of the trading strategies.

The team works with specific indicators and has introduced complementary monitoring tools, specifically designed for the needs of the continuous evolution of the power market. The goal is to systematically comb through all data generated by the market and all relevant stakeholders and to reveal patterns that could point to suspicious behaviour. Deeper investigations are done when needed.

One of the risks associated with algorithmic trading is a very high ratio of unexecuted orders to transactions. If an extremely large number of orders results in only a few transactions, this may raise doubts about the economical justification behind the orders. This is why EPEX SPOT has established a so-called order-to-trade ratio, setting the maximum number of submitted orders out of which at least one must result in a trade. Non-compliance with this rule is penalised.

THE POWER EXCHANGE AS EXPERT ON ALGORITHMIC TRADING

The expertise of the Market Surveillance team allows them to live up to the daily challenges. The team is composed of profiles from various fields: experts from the political and legal side work along with system specialists, algorithm experts, market experts and team members with trading desk experience.

As Power Exchange, EPEX SPOT has been providing the environment for algorithmic trading for years and has solid expertise in the field. We are sharing this expertise with regulators across Europe and attend and organise workshops and events on the topic.

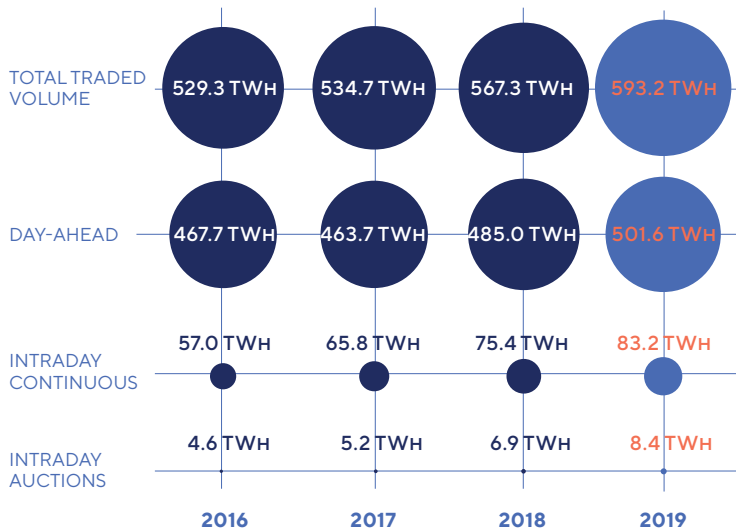
In addition to this, we take a strong stance for prevention. Through workshops, e.g. on REMIT Understanding, and constant dialogue, we support our customers in meeting requirements to guarantee a fair and orderly market.

KEY FIGURES

593.2 TWH

TOTAL TRADED VOLUMES

YEARLY INTRADAY VOLUMES (TWH)



THE EPEX SPOT COMMUNITY

302

TRADING PARTICIPANTS

21

CERTIFIED ISVS

24

TOTAL MEMBER ADMISSIONS IN 2019

+11.3%

AT

AUSTRIA

+20.2% REACHING **2.9 TWH**

CH

SWITZERLAND

0.8 TWH

DE

GERMANY

53.7 TWH

FR

FRANCE

+29.9% REACHING **7.7 TWH**

GB

GREAT BRITAIN

PASSED THE 20 TWH MARK FOR THE FIRST TIME AND REACHED

21.6 TWH

NL

NETHERLANDS

+55.7% REACHING

3.3 TWH

A person is sitting on a wooden floor, wearing blue jeans and dark sneakers. In the background, there is a windowsill with several potted plants, including a large one with red and yellow leaves. A red arc is drawn over the top of the image.

OPENING OUR

FIELDS



WHAT'S NEW IN EUROPE?

MARKET COUPLING PROJECTS HANDLE INCREASED COMPLEXITY TO DELIVER EUROPEAN SOLUTIONS.



A

fter an extremely active year in 2018, the Market Coupling parties didn't rest for one moment and continued their joint work towards the European target models throughout the year 2019.

The next major milestone in Day-Ahead coupling will be the implementation of so-called Multi-Nemo Arrangements across Europe, for which the foundation has already been laid in Central Western Europe.

The Cross-Border Intraday market project XBID saw the go-live of its so-called second wave, with new countries joining the pan-European Intraday coupling. This was a major step towards the target model Single Intraday Coupling (SIDC).

SDAC AND SIDC – TWO TARGET MODELS WITH A SHARED GOAL

The Single Day-Ahead Coupling (SDAC) and Single Intraday Coupling (SIDC) are the two target models set by the European Union to harmonise and improve Market Coupling mechanisms across the continent. The terms were introduced with the Guideline on Capacity Allocation and Congestion Management in 2015. The target models have been developed further in the Clean Energy for all Europeans Package in 2017.

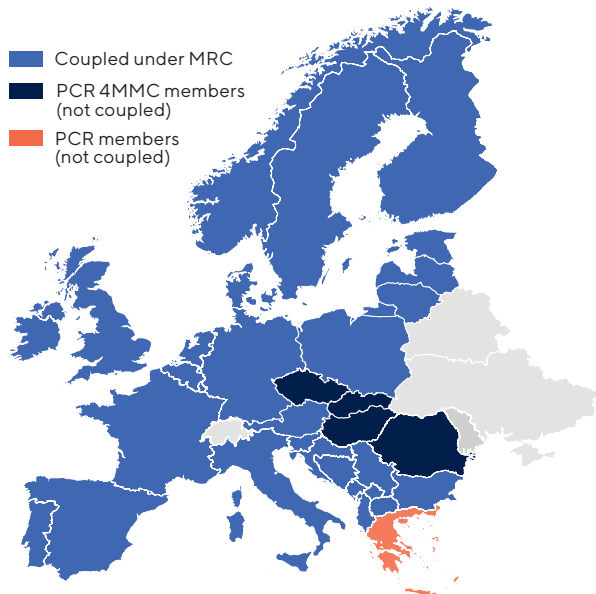
The goal of SDAC is to create a single pan-European cross-zonal Day-Ahead electricity market. An integrated Day-Ahead market increases the overall efficiency of trading by promoting effective competition, increasing liquidity and enabling a more efficient utilisation of the generation resources across Europe.

SIDC creates a single EU cross-zonal Intraday electricity market. Buyers and sellers of energy are able to trade electricity continuously across Europe on the day the energy is needed. As renewable production increases, Intraday markets are of growing importance to market participants. This is because it has become more challenging for market participants to be in balance (i.e. supplying the correct amount of energy) after the closing of the Day-Ahead market.

TAKING MARKET COUPLING TO THE NEXT LEVEL

The involved Power Exchanges and Transmission System Operators are currently preparing major enhancements of SDAC in the upcoming years: Multi-Nemo Arrangements (MNA) are to be implemented across Europe. They allow for more than one Power Exchange to be active in a market area. This fosters competition, to the benefit of the market.

DAY-AHEAD MARKET COUPLING



The MNA is already in place in the Central West Europe region. The launch of the MNA in the Nordic region will allow EPEX SPOT offer trading on these new markets. In addition to this, the flow-based methodology will be extended to further geographical areas, namely the Czech Republic, Hungary, Romania and Slovakia. In addition, new interconnectors will be included in SDAC and new releases of the price coupling algorithm are planned.

Intense work also continues to proceed with the implementation of SIDC, which will be complemented by further "waves" of countries such as Greece and Italy joining the coupling mechanism. In addition to this, the target model continues to evolve, and new requirements have to be implemented, such as new pan-European Intraday auctions.

These evolutions require not only close coordination between Power Exchanges, Transmission System Operators and market participants, they also call for changes down to every individual system. The European Market Coupling mechanisms absorb an increasing complexity, demanding constant developments and investments from all involved parties.

The ongoing work on new Market Coupling features will keep us busy for many years to come and we look forward to the next steps in this European endeavour.

XBID 2ND WAVE GO-LIVE

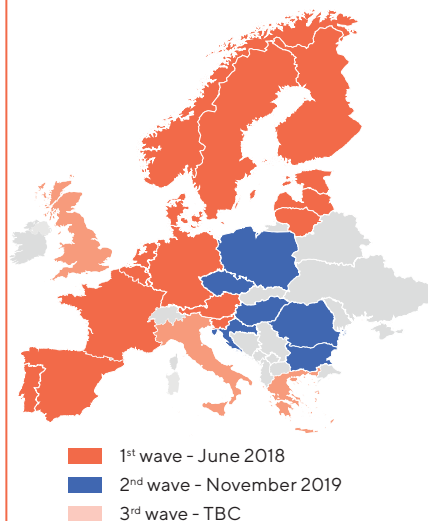
SEVEN COUNTRIES JOINED

In November 2019, Bulgaria, Croatia, the Czech Republic, Hungary, Poland, Romania and Slovenia joined the SIDC solution (formerly known as XBID). With this go-live, significant increases in traded volumes were reported across the seven countries that joined.

21

COUNTRIES
ARE NOW COVERED BY SIDC,
WITH MORE TO COME.

INTRADAY MARKET COUPLING



A NEW STAGE FOR EPEX SPOT

*IN 2019, EPEX SPOT
STARTED A NEW
CHAPTER IN ITS
COMPANY HISTORY,
WORKING ON TWO
NEW BALANCING
MARKET PROJECTS
FOR EUROPEAN
TRANSMISSION SYSTEM
OPERATORS (TSOs).*

WHAT IS BALANCING?

The European electricity grid operates at a frequency of 50 Hertz. For this frequency to remain stable, TSOs have to balance the electricity grid so the sum of the electricity added to the grid and taken off the grid always remains zero. To do this, there are various balancing mechanisms used across the continent to ensure that the electricity grid always operates at the correct frequency. Historically, each country or region has developed its own set of balancing arrangements. They are based on the need to change generation output to balance the grid.

THE EU GUIDELINE ON ELECTRICITY BALANCING

Entered into force in 2017, it signalled profound changes to the organisation of balancing in Europe. This new EU Guideline will create a harmonised playing field for market participants in Europe where countries can share the resources used by TSOs to ensure generation equals demand at all times. It also allows demand response and renewables to participate in these markets –an important measure to facilitate the energy transition across Europe. With this Guideline, the EU aims at increasing security of supply, limit emissions and decrease costs for the end-consumer.

AND WHAT IS THE ROLE OF THE POWER EXCHANGE IN ALL THIS?

EPEX SPOT is a neutral and independent actor. This avoids any possible conflict of interest that could emerge along the value chain of balancing. As an established and trusted actor in the energy community, we bring to these projects our expertise in developing and operating markets. In 2019, we have worked on two major projects in this field.

TERRE

MONITORING SERVICES FOR EUROPEAN TSOs

The EU Guideline on electricity balancing defines the tasks and timelines for the implementation of a European platform for the exchange of balancing energy from replacement reserves (RR). European TSOs from eight countries have launched TERRE, the Trans European Replacement Reserve Exchange, an implementation project to exchange replacement reserves across borders.

TERRE went live on 6 January 2020 using the LIBRA platform for exchanging electricity Replacement Reserves (RR), and thus establishing the European RR balancing energy market. EPEX SPOT provides IT monitoring services for the LIBRA platform which is based on a shared IT system and algorithm, optimising the allocation of balancing bids submitted by the TSOs to meet their imbalance needs.

The EPEX SPOT Market Operations team monitors the platform throughout the year on a 24/7 basis and provides a dedicated service desk to provide first-line user support.

This project has shown that close cooperation, at a European level, can optimise the exchange of balancing energy.

“These monitoring services allow us to bring our expertise in operating markets to the TERRE project partners. For us Market Operators it is really interesting to interact with these new partners and to fully dive into the field of balancing markets.”



LINDSAY NOBLE

TEAM COORDINATOR MARKET
OPERATIONS AT EPEX SPOT

FREQUENCY RESPONSE AUCTION

TRIAL IN GREAT BRITAIN
OPENING UP THE MARKET TO MORE DIVERSE ACTORS

Another essential service of TSOs is the provision of Frequency Response. It ensures that in cases of interruption of supply, the frequency of the electricity system is kept stable at all times. TSOs have different ways of procuring frequency response from the actors of the power market. In Great Britain, where National Grid Electricity System Operator (NG ESO) is in charge of frequency

response services, the procurement setup in place until last year was adapted to long-term provision only, largely catered to by conventional electricity producers.

This is why, in line with their System Needs & Product Strategy, NG ESO decided to trial a new route to market to procure frequency response from industry providers, by launching a weekly auction.

EPEX SPOT developed and operates the platform which hosts the Frequency Response auction trial in Great Britain. The weekly, pay-as-clear auctions take place every Friday. Order books close at 9:30 GMT and results are published on the NG ESO website at 14:00 GMT, for service delivery starting the same day. The frequency response auction trial was launched on 29 November 2019, with 10,284 MW traded during the first auction.

The new auction allows the provision of frequency response services to a wider mix of technology types. By moving closer to real-time, less predictable technologies, such as wind, can participate as well, along with industrial and commercial sites and traditional providers.



**COLM
MURPHY**

HEAD OF ELECTRICITY MARKET CHANGE
DELIVERY FOR NATIONAL GRID ESO

“The frequency response auction trial supports a core objective of the Electricity System Operator to remove barriers to entry and promote competition. Participation in the auction by new providers supports us in achieving carbon-free operation by 2025 and the net-zero transition. We expect the auction to increase liquidity in the frequency response market, reduce our overall balancing costs, and deliver value for the end-consumer.”

FIRST AUCTION ON

29 NOV.
2019

10,284 MW

TRADED DURING FIRST AUCTION



10 YEARS

OF POWER



LOOKING BACK

**IN 2019 EPEX SPOT
CELEBRATED 10 YEARS
OF POWER, OUR TENTH
ANNIVERSARY.
WE LOOK BACK ON A
DECADE OF ACHIEVEMENTS
THAT BROUGHT THE
EUROPEAN POWER SECTOR
CLOSER TOGETHER.**



ver the years, the reference price emerging from our liquid and transparent markets has become an essential pillar of the energy transition.

Within ten years, the initially Franco-German initiative EPEX SPOT which was created as a joint venture of the exchanges European Energy Exchange (EEX) and Powernext has become a strong Europe-wide business. In its first year under the EPEX SPOT company name, the Exchange registered 203 TWh of traded volume in 2009. This figure was more than doubled in the following decade, with 593 TWh traded in 2019 – a new record.

EPEX SPOT has been a forerunner in innovation on the power market, introducing its first flexibility product in 2014. Today, EPEX SPOT has the most diverse trading product portfolio in Europe.

CORPORATE

FLASH BACK

2001

Establishment of Powernext SA, operator of the French power market.

2002

Establishment of EEX AG, operating the German and Austrian power market.

17 SEPTEMBER 2008

The European Power Exchange EPEX SPOT SE is created as legal entity, owned 50/50 by Powernext SA and EEX AG.

COUPLING & REGULATION

1996

First European Directive on Internal Energy Market enters into force, setting the basis for the liberalisation of wholesale energy markets in Europe.

2006

Launch of Trilateral Coupling (TLC): the first market coupling initiative between France, Belgium and the Netherlands is established by Powernext and its Dutch counterpart APX.

2009

Powernext Power Spot and EEX Power Spot are transferred into EPEX SPOT SE.

10 YEARS OF VOLUMES

202.9
TWh

2009

593.2
TWh

2019



FIRST

**14 DEC.
2011**

LAUNCH OF THE FIRST FLEXIBILITY PRODUCT: 15-MINUTE CONTRACTS TO FACILITATE THE INTEGRATION OF POWER FROM RENEWABLE ENERGY SOURCES.

FIRST

**9 DEC.
2014**

SUCCESSFUL LAUNCH OF 15-MINUTE INTRADAY AUCTION IN GERMANY.

9 NOVEMBER 2010

Market Coupling in Central Western Europe (CWE) and the Interim Tight Volume Coupling between CWE and the Nordics launches successfully.

14 DECEMBER 2010

French and German Intraday markets are coupled.

16 OCTOBER 2012

EPEX SPOT launches Intraday trading in Austria.

26 JUNE 2013

EPEX SPOT launches the Intraday market in Switzerland.

4 FEBRUARY 2014

First implementation of PCR: Price Coupling in North-Western Europe (NWE) launches successfully, covering now Germany, France, Benelux, Great Britain, the Nordic and Baltic countries.

13 MAY 2014

First extension of PCR: Price Coupling in South-Western Europe (SWE) launches successfully, covering France, Spain and Portugal.



LOOKING FORWARD

EPEX SPOT's markets connect countries while offering country-specific services. Numerous projects on consumer empowerment and new market models lie ahead, while the sector is united in its fight against climate change. Today, the Exchange operates markets in Central Western Europe and Great Britain, the Nordic countries are scheduled to join in 2020. We also prepare market launches in the Baltics and Poland.

Dedicated to improving social welfare, committed to enabling the energy transition, everybody at EPEX SPOT looks forward to further carving out the role of the European Power Exchange in the energy world.

10 YEARS OF EPEXIAN

10
EMPLOYEES

2009



2019

1ST JANUARY 2015

New shareholder structure: Transmission system operators of HGRT take 36.7% stake in EPEX SPOT, EEX at 13.3%, Powernext at 50%.

17 APRIL 2015

EPEX SPOT and APX Group announce their integration in order to form a Power Exchange covering 8 countries.

4 MAY 2015

New shareholder structure: EEX Group now holds 51% and transmission system operators of HGRT rise to 49%. EPEX SPOT becomes 100% owner of APX.

31 MARCH 2016

Clearing activities for British, Dutch and Belgian markets, formerly operated by APX, are being migrated to European Commodity Clearing (ECC). This lays the foundation for the integration of systems between APX and EPEX SPOT.

24 FEBRUARY 2015

Second extension of PCR: Italy and Slovenia join the Multi-Regional Coupling.

15 DECEMBER 2015

EPEX SPOT obtains NEMO status in all its core markets and announces extension of services to Nordics and Poland.



SEEING HOW OUR SOLUTIONS CONTRIBUTE TO A BETTER ENERGY UNION IS WHAT MOTIVATES US EVERY DAY.

THE DEVELOPMENT AND TRANSFORMATION OF EPEX SPOT OVER TIME HAVE BEEN EXTRAORDINARY. NOT ONLY THE TEAMS HAVE GROWN, BUT SO HAS THE SCOPE AND IMPACT OF OUR WORK. WE BELIEVE THAT EFFICIENT MARKETS ARE AN INDISPENSABLE ASSET TO ACHIEVE THE ENERGY TRANSITION.

13 OCTOBER 2018

Jean-François Conil-Lacoste, CEO and founder of EPEX SPOT, steps down from his CEO mandate. He is followed by Ralph Danielski.

APRIL & NOVEMBER 2018

Migration of the UK Day-ahead and Intraday markets to ETS and M7 respectively, completing the integration of APX and EPEX SPOT.

2019

EPEX SPOT CELEBRATES 10 YEARS OF POWER, ITS 10TH ANNIVERSARY.

12 JUNE 2018

Go-live of the European Cross-Border Intraday Solution XBID connecting the Intraday market of 14 countries.

FEBRUARY 2019

Launch of enera, the first Local Flexibility Market in the North-West of Germany.

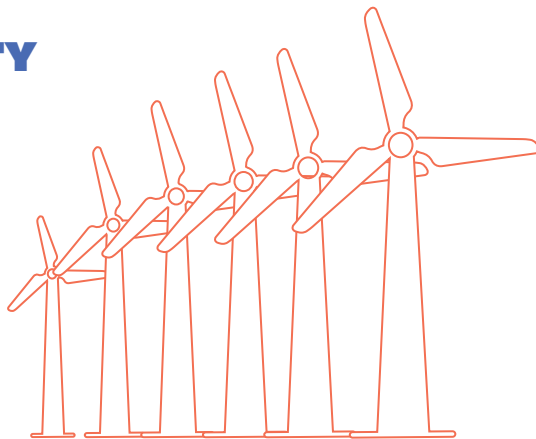
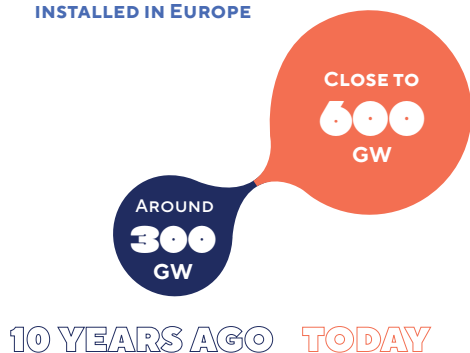
NOVEMBER 2019

Launch of the Frequency Response Auction trial in Great Britain, EPEX SPOT's first step into the field of balancing services

FUN FACTS

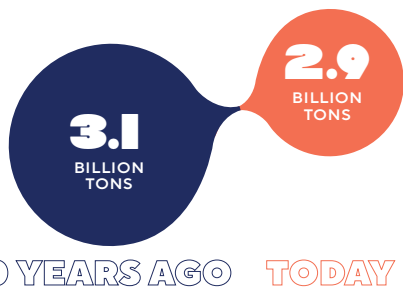
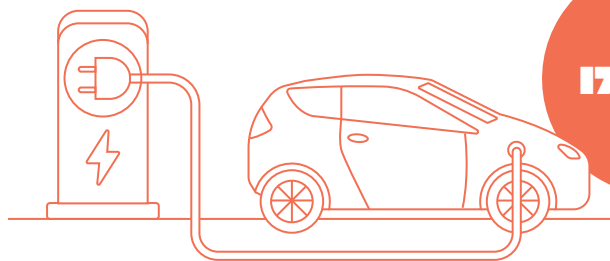
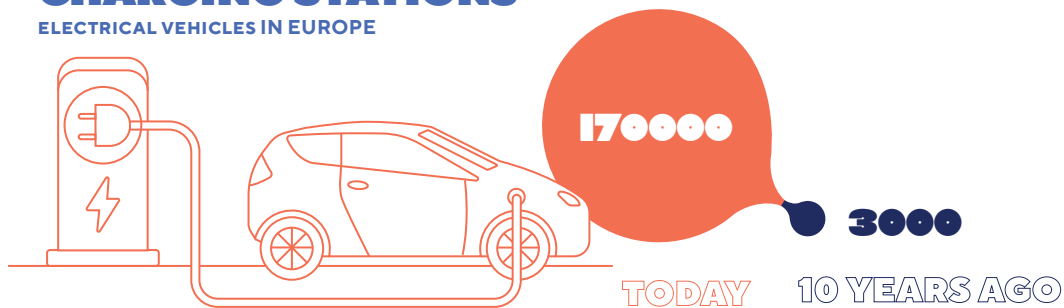
RENEWABLE CAPACITY

INSTALLED IN EUROPE



CHARGING STATIONS

ELECTRICAL VEHICLES IN EUROPE



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and our e-learning program,
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LONSDALE

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