

AFRY

ÅF PÖYRY



# BID3live: Power forward curve modelling and the impact of COVID-19

7 May 2020

STEPHEN WOODHOUSE, JAMES COX, OVIDIU STOICA

INTRODUCTION

# Our Presenters



**Stephen  
Woodhouse**

**Stephen Woodhouse**  
Director  
[stephen.woodhouse@afry.com](mailto:stephen.woodhouse@afry.com)  
+44 7970 572444



**James Cox**

**James Cox**  
Director  
[james.cox@afry.com](mailto:james.cox@afry.com)  
+44 7740 484395



**Ovidiu Stoica**

**Ovidiu Stoica**  
Senior Consultant  
[ovidiu.stoica@afry.com](mailto:ovidiu.stoica@afry.com)  
+44 7384 215964

## INTRODUCTION

# DISCLAIMERS AND RIGHTS

NOTHING IN THIS REPORT IS OR SHALL BE RELIED UPON AS A PROMISE OR REPRESENTATION OF FUTURE EVENTS OR RESULTS. AFRY HAS PREPARED THIS REPORT BASED ON INFORMATION AVAILABLE TO IT AT THE TIME OF ITS PREPARATION AND HAS NO DUTY TO UPDATE THIS REPORT.

AFRY makes no representation or warranty, expressed or implied, as to the accuracy or completeness of the information provided in this report or any other representation or warranty whatsoever concerning this report. This report is partly based on information that is not within AFRY's control. Statements in this report involving estimates are subject to change and actual amounts may differ materially from those described in this report depending on a variety of factors. AFRY hereby expressly disclaims any and all liability based, in whole or in part, on any inaccurate or incomplete information given to AFRY or arising out of the negligence, errors or omissions of AFRY or any of its officers, directors, employees or agents. Recipients' use of this report and any of the estimates contained herein shall be at Recipients' sole risk.

AFRY expressly disclaims any and all liability arising out of or relating to the use of this report except to the extent that a court of competent jurisdiction shall have determined by final judgment (not subject to further appeal) that any such liability is the result of the wilful misconduct or gross negligence of AFRY. AFRY also hereby disclaims any and all liability for special, economic, incidental, punitive, indirect, or consequential damages. **Under no circumstances shall AFRY have any liability relating to the use of this report.**

All information contained in this report is confidential and intended for the exclusive use of the Recipient. The Recipient may transmit the information contained in this report to its directors, officers, employees or professional advisors provided that such individuals are informed by the Recipient of the confidential nature of this report. All other use is strictly prohibited.

All rights (including copyrights) are reserved to AFRY. No part of this report may be reproduced in any form or by any means without prior permission in writing from AFRY. Any such permitted use or reproduction is expressly conditioned on the continued applicability of each of the terms and limitations contained in this disclaimer.

# Agenda

## **Modelling power market forwards using BID3live**

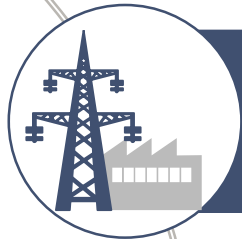
Outlook for future market prices and  
impact of COVID-19

How AI and fundamental modelling  
together could shape the future

Conclusions



## What questions does BID3 answer?

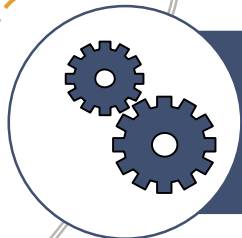


System studies:  
Decarbonisation, effect of regulation, grid investment



Operational revenue and investment analysis:  
Thermal, renewables, batteries, flexibility, interconnectors

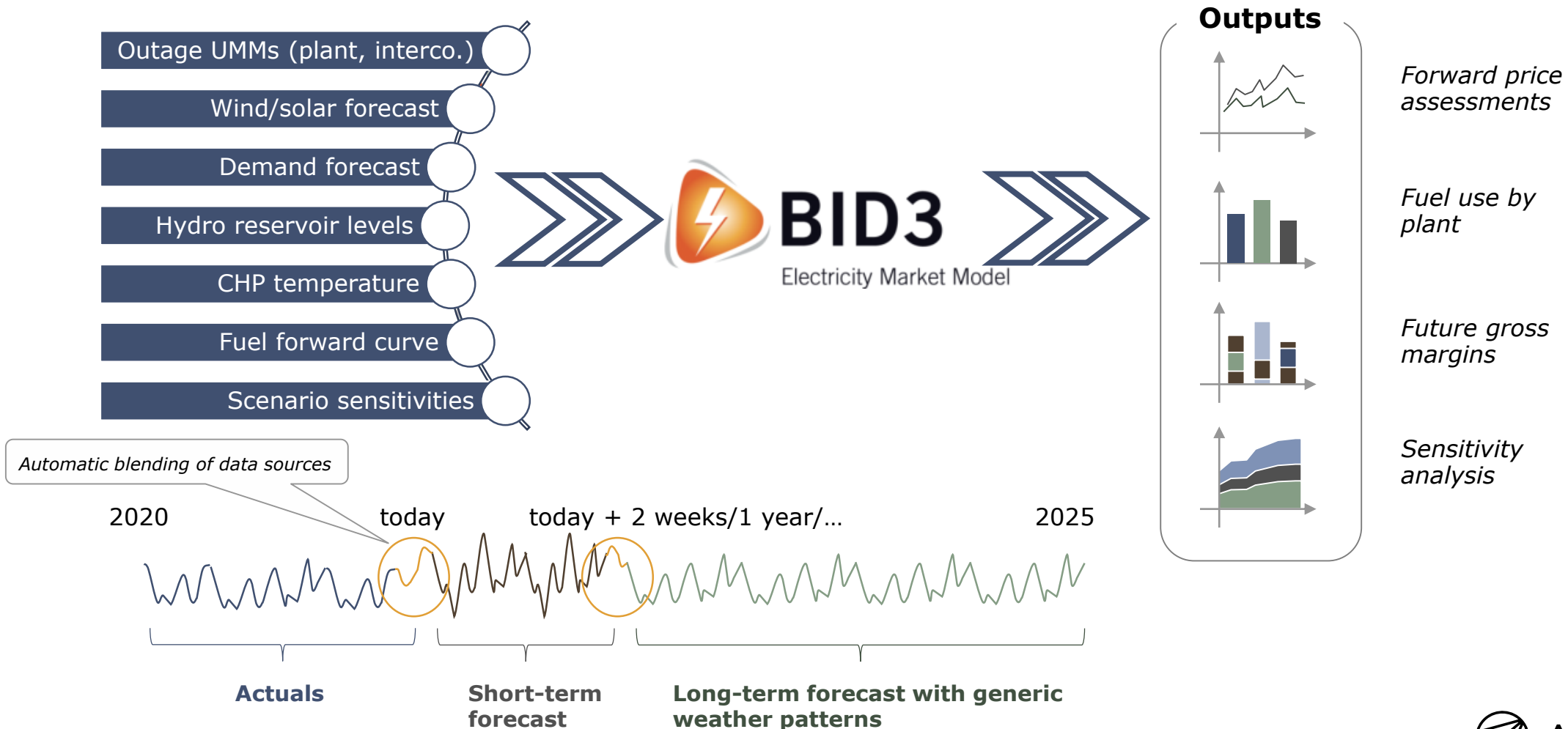
*This presentation*



Market operation:  
Forward curve prices, trading, impact of weather and outages

[Watch a general introduction](#)

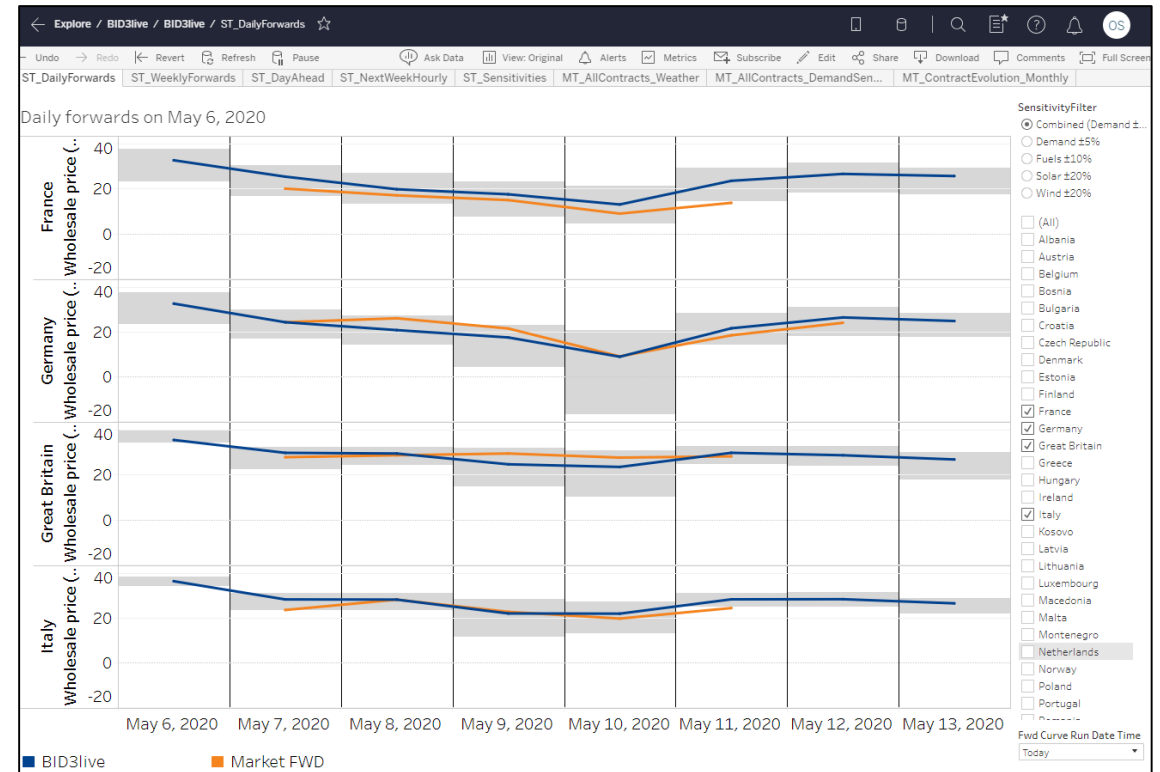
# Modelling the forward curve is all about data: BID3 feeds in numerous forecasts to create a 'digital twin' of the power market



## BID3LIVE – WHAT IS IT?

We simulate the full forward curve on a daily basis with the latest forecasts of weather and market data

- BID3live takes the latest forecast of weather data, demand and plant outages from [Energy Quantified](#)
- The data preparation process is fully automated in Python and, together with BID3, is available as a turn-key solution
- Projections made at two timeframes:
  - Next 4 weeks
  - From month+1 to year+2
- BID3live enables a comprehensive ‘what-if’ analysis around all fundamental drivers
- Results available:
  - on a Tableau web platform
  - through an API linked to Tableau (automatic download)



- Output available: prices, flows, generation per asset, cash flows, range of uncertainties (weather, demand, fuels, etc.)



# Agenda

Modelling power market forwards using  
BID3live

## **Outlook for future market prices and impact of COVID-19**

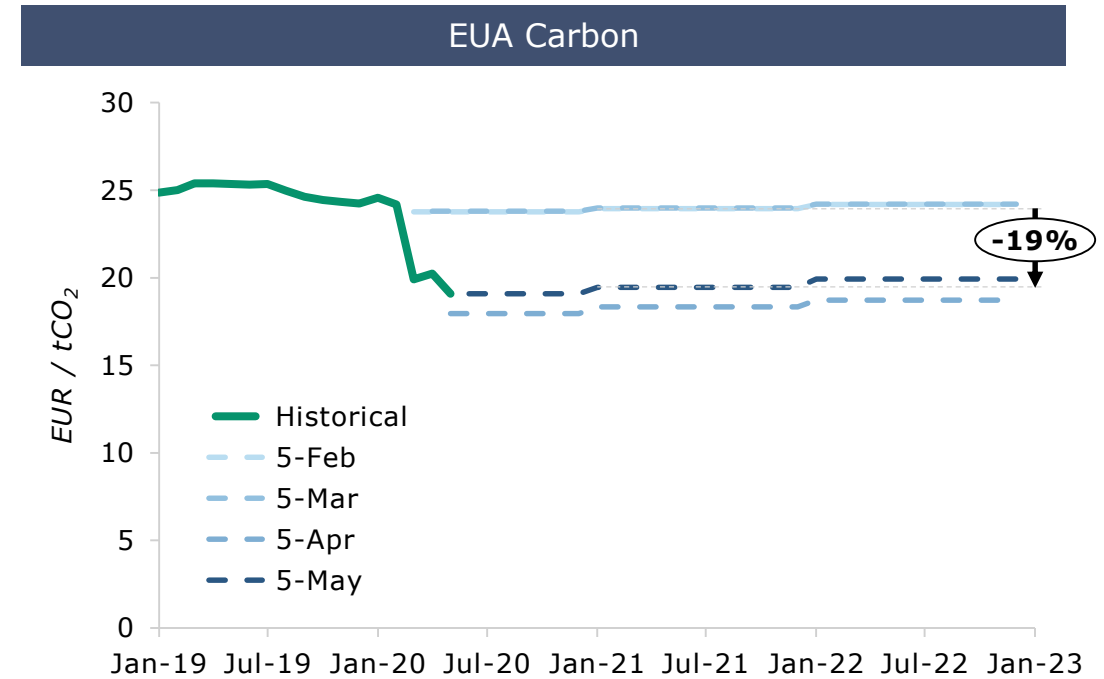
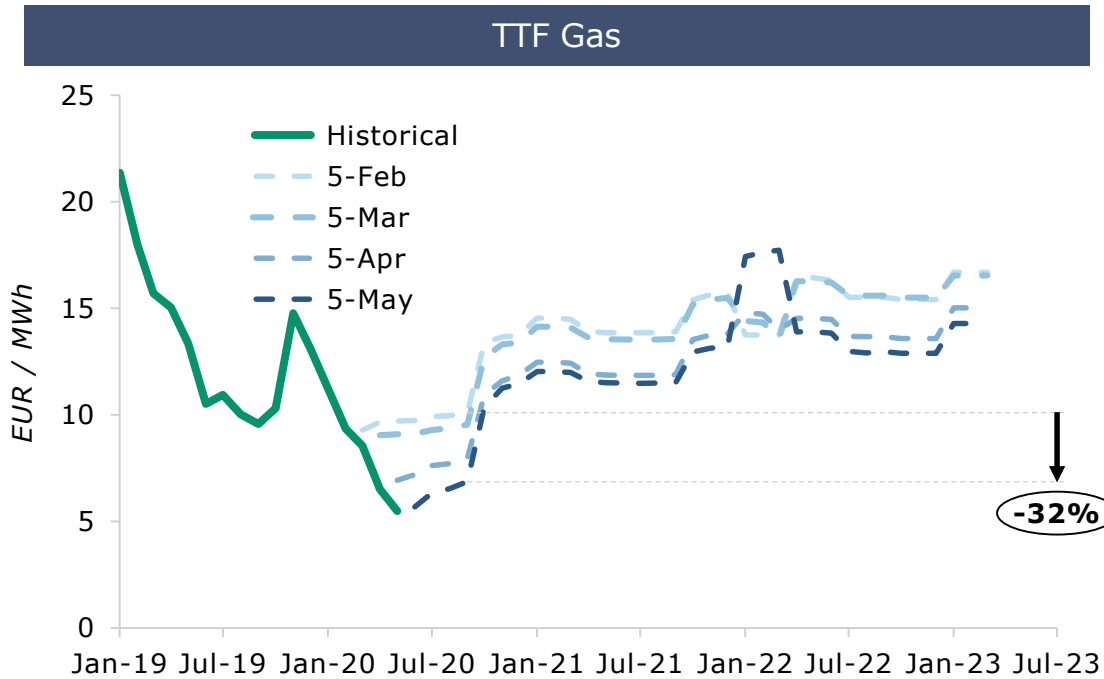
How AI and fundamental modelling  
together could shape the future

Conclusions



COMMODITY PRICES

Commodity prices have dropped to record lows over the past few months, but the forwards, particular gas, are in steep contango



PLANT OUTAGES

Although we factor in all known maintenance and outages, French nuclear availability is the biggest influence due to the volume of generation involved

MONTEL

Print Add to favorites

**EDF cuts 2020 nuclear output goal by 20% to 300 TWh**

(Montel) EDF has reduced its 2020 nuclear output target by up to 20% impact of the coronavirus pandemic on its reactor maintenance schedule.

The firm warned it may have to shut down "a number of reactors" this summer to ensure supplies this winter.

"The economic slowdown has brought about a drop in electricity consumption to fall to 20% of usual levels, thereby resulting in reduced nuclear output," it said.

"Working alongside TSO RTE, and to help provide a continuous supply of power throughout 2020-2021, a number of nuclear reactors may have to be taken offline throughout the autumn in order to save fuel on these power plants," the firm added.

**France to see new reactor maintenance calendar in days**

(Montel) French utility EDF will soon present an updated calendar of reactor maintenance outages, after the previous schedule had to be modified amid the health crisis, energy minister Elisabeth Borne said.

"We should have this new programme in a few days," the minister told a hearing on Thursday of the Assemblee Nationale's sustainable development committee. "The important issue is minimising disruption to the programme of reactor refuelling and maintenance."

She stressed the aim of ensuring reactor availability, "especially for next winter".

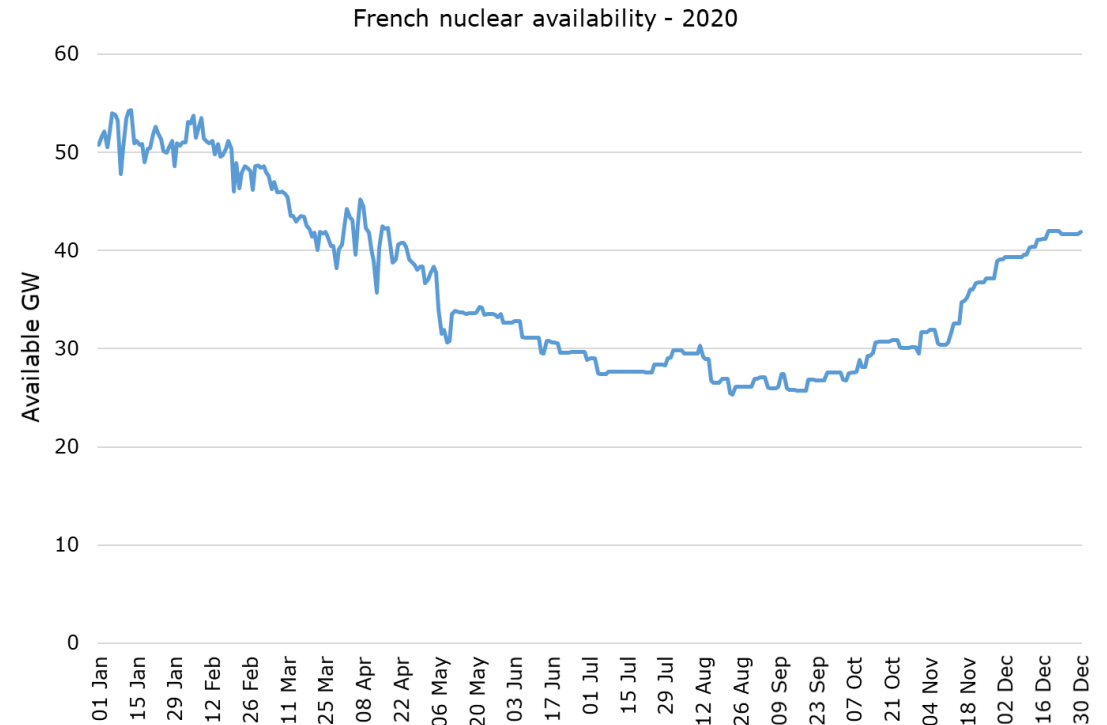
EDF was working on its plans with the ministry and French nuclear safety authority ASN, she added.

EDF announced on Thursday a reduced nuclear output goal of 300 TWh in 2020 due to the coronavirus crisis effects on maintenance. It expects 330-360 TWh output in 2021 and 2022.

Having already postponed over 30 maintenance outages, the public utility plans to perform outages in summer and autumn to save fuel, thereby avoiding refuelling next winter.

Efforts will be concentrated on restarting five reactors (4.5 GW), but EDF has also extended outages at Flamanville 1 and 2 (1.3 GW each) as well as Paluel 1 (1.3 GW) by several months.

**PLANT AVAILABILITY IN BID3LIVE**



BID3live pulls in all the latest REMIT data on plant outages and maintenance

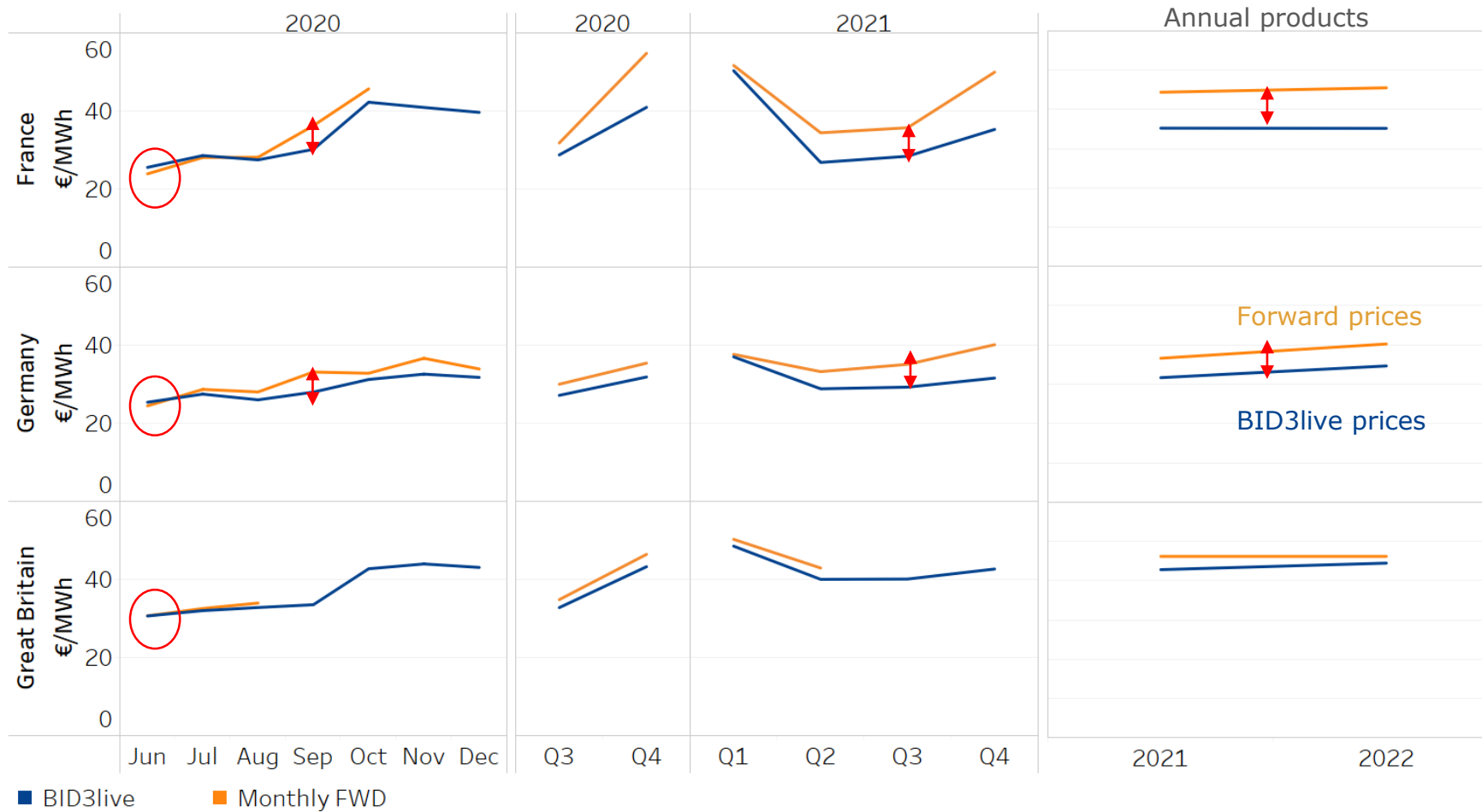
BID3 SCOPE

BID3live covers all major European markets, although we'll focus today on France, Germany and GB



# BID3live produces an hourly forward curve, which we've aggregated into traded forward products

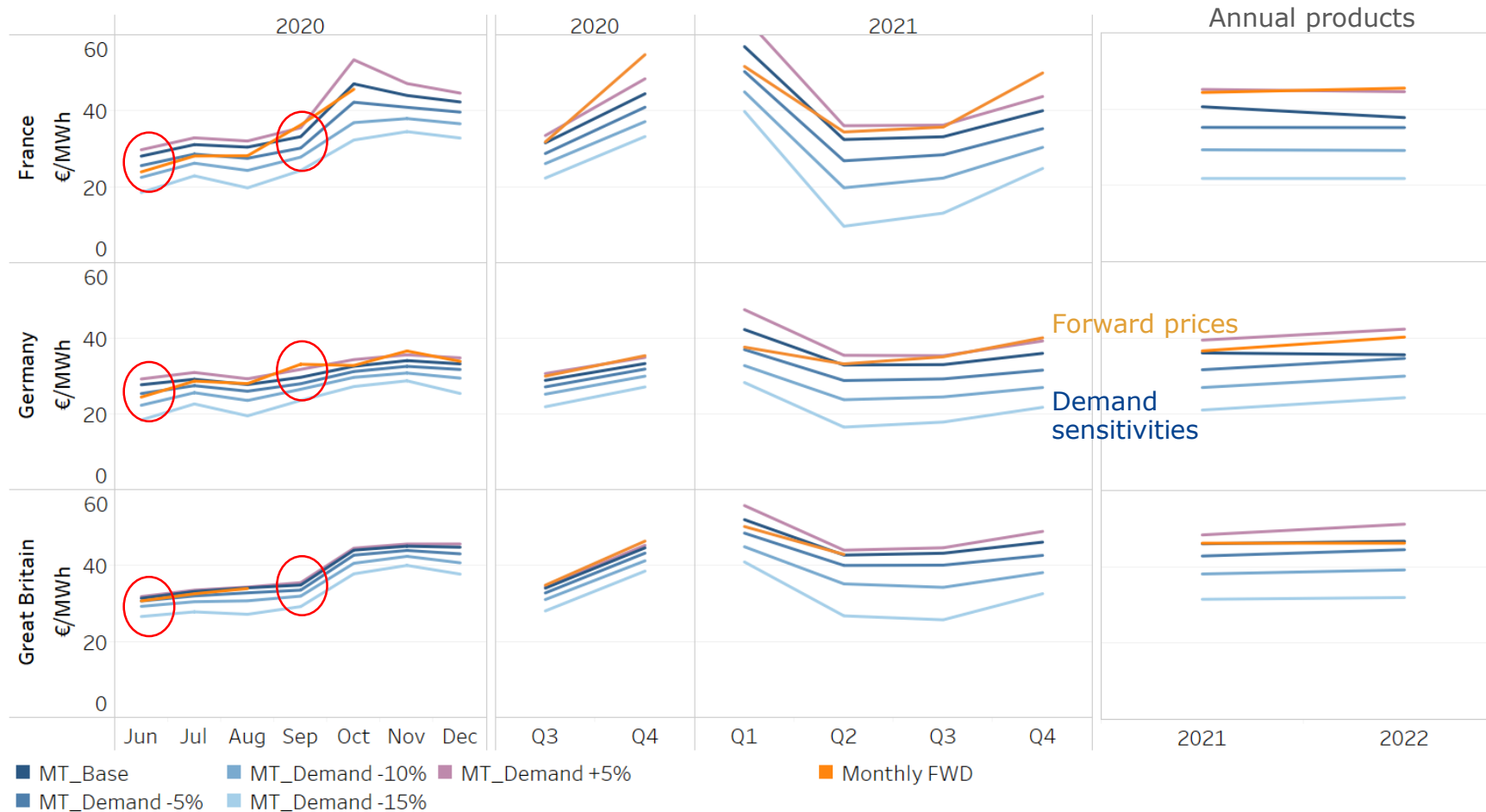
Forward curve on 5 May 2020



- Power prices are in contango, impacted by rising commodity prices across 2021-22
- BID3 and market show a good match in June 2020 contract, but diverge afterwards
- Market prices are much higher than BID3 by Sept

# To understand the impact of COVID-19, we've looked at different demand levels over the next couple of years

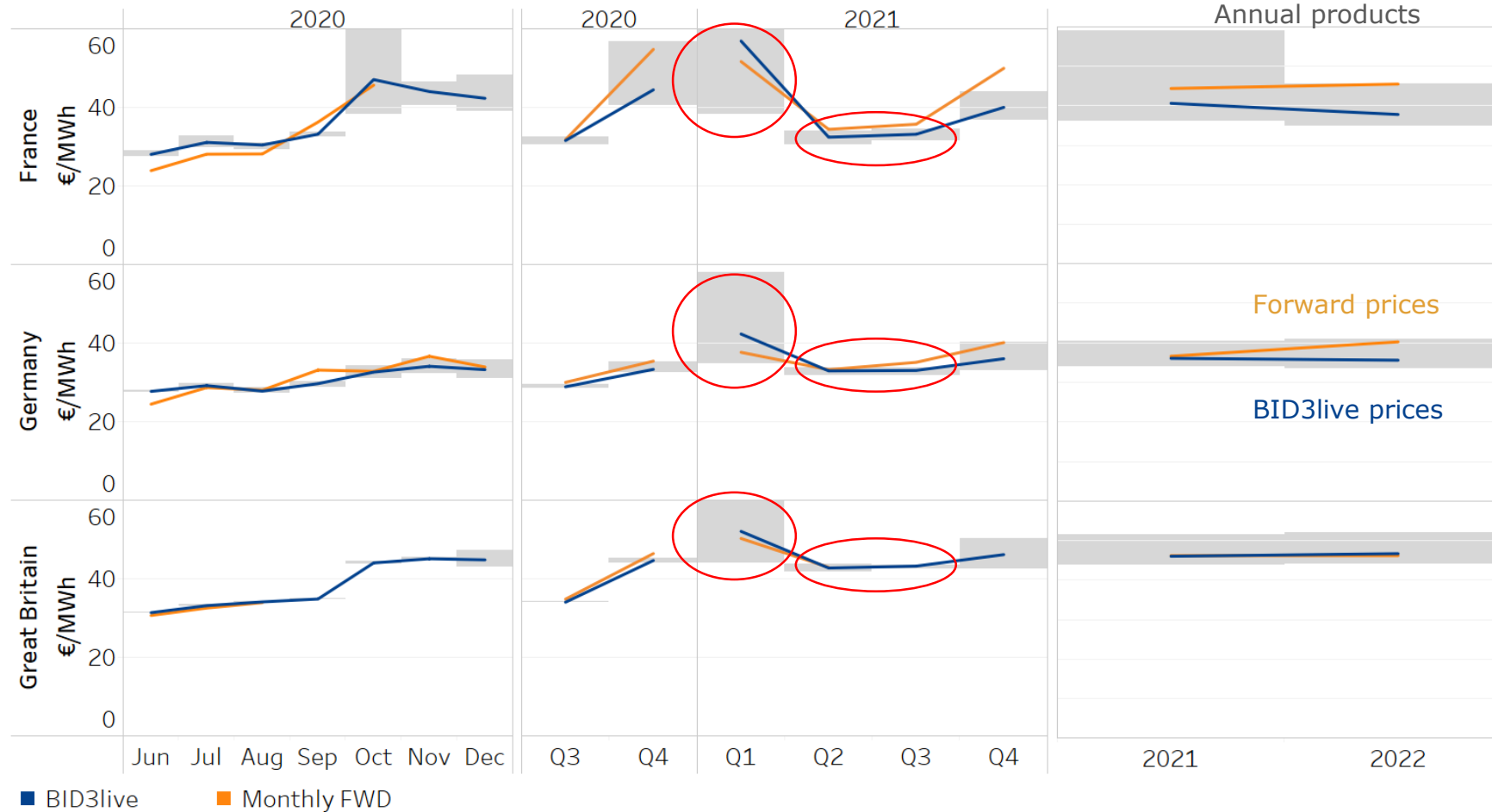
Forward curve on 5 May 2020 (demand sensitivities)



- BID3live allows sensitivities to be quickly built up and run every night
- Sensitivities here look at a range of demand from +5% to -15%
- We're interested in when the market believes economic activity and demand will return to normal

# BID3 live also allows the impact of weather to be examined

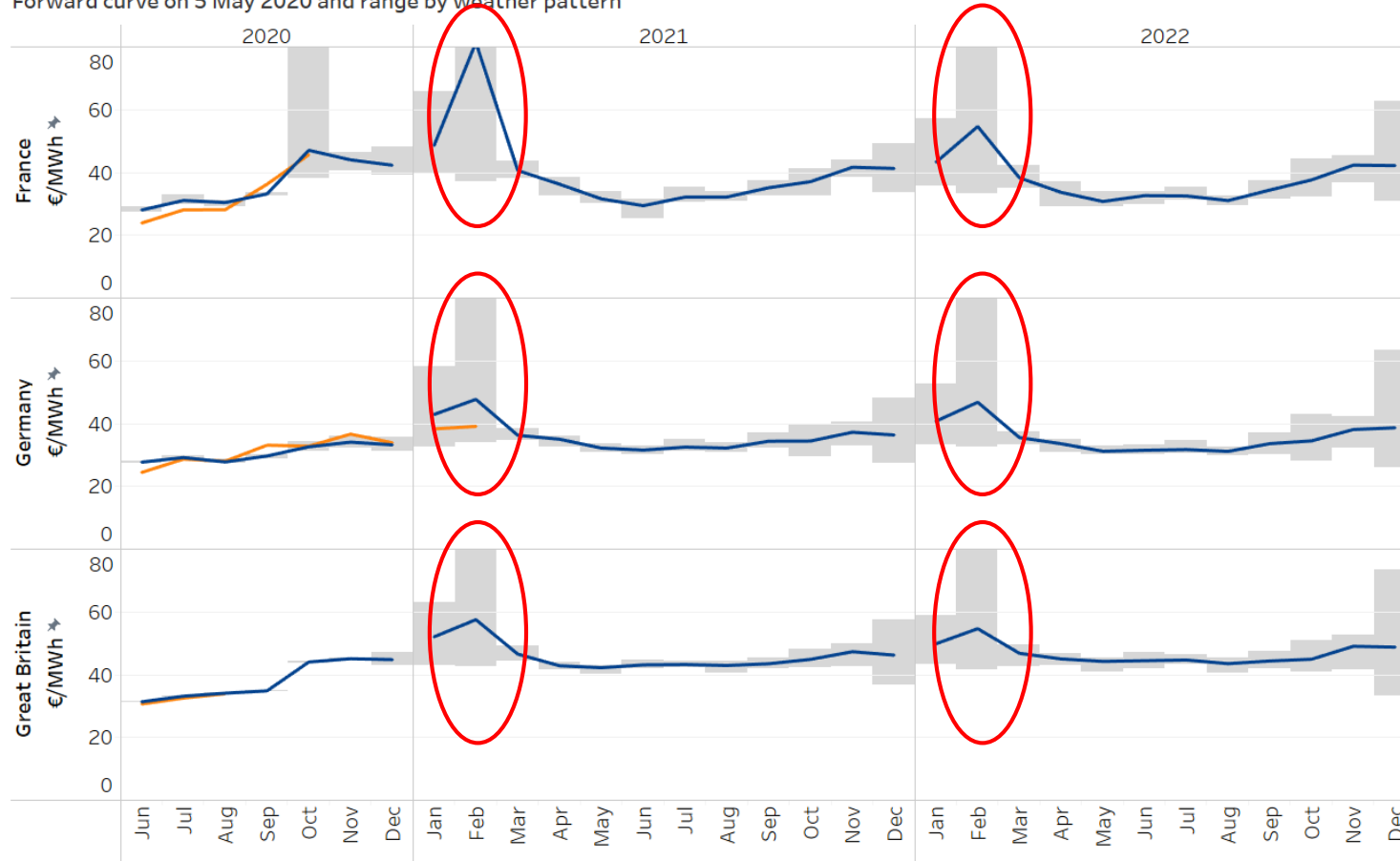
Forward curve on 5 May 2020 (weather year range)



- We run a range of weather patterns, highlighted in grey
- Winter prices exhibit more weather risk
- Summer prices tend to exhibit lower risk

# Certain weather patterns, if repeated, could have a big impact on market outcomes

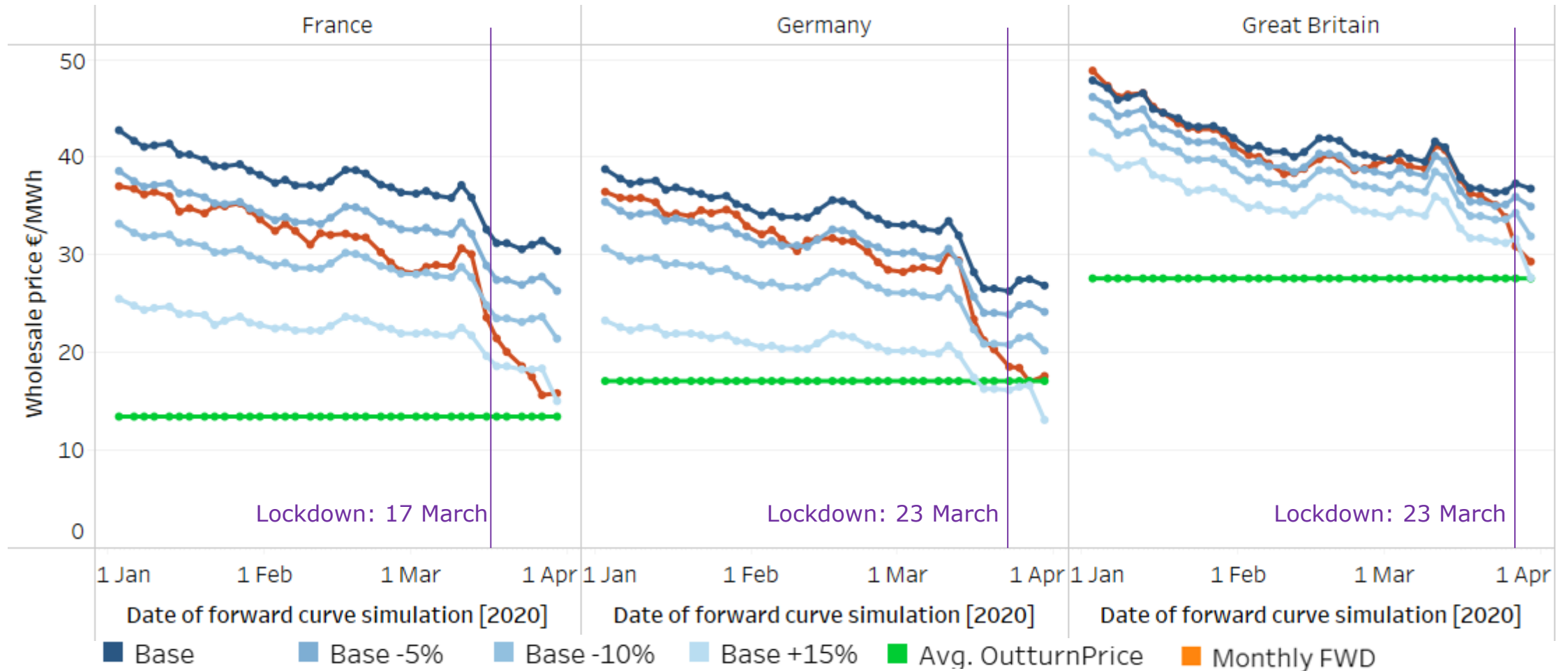
Forward curve on 5 May 2020 and range by weather pattern



- Feb 2012 was very cold and still
- European markets are now much more exposed to weather impacts than in the past
  - Much more wind on the system
- A repeat of a similar weather pattern could change prices substantially



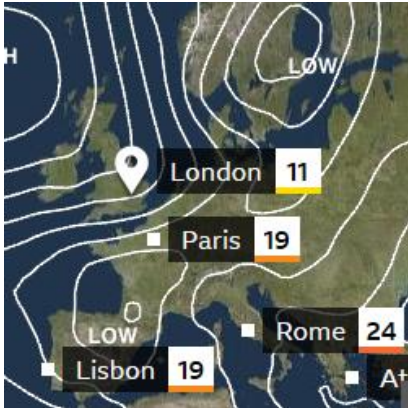
BID3live allows automatic sensitivities to be carried out: in this case we've looked at varying demand levels against the April 2020 contract



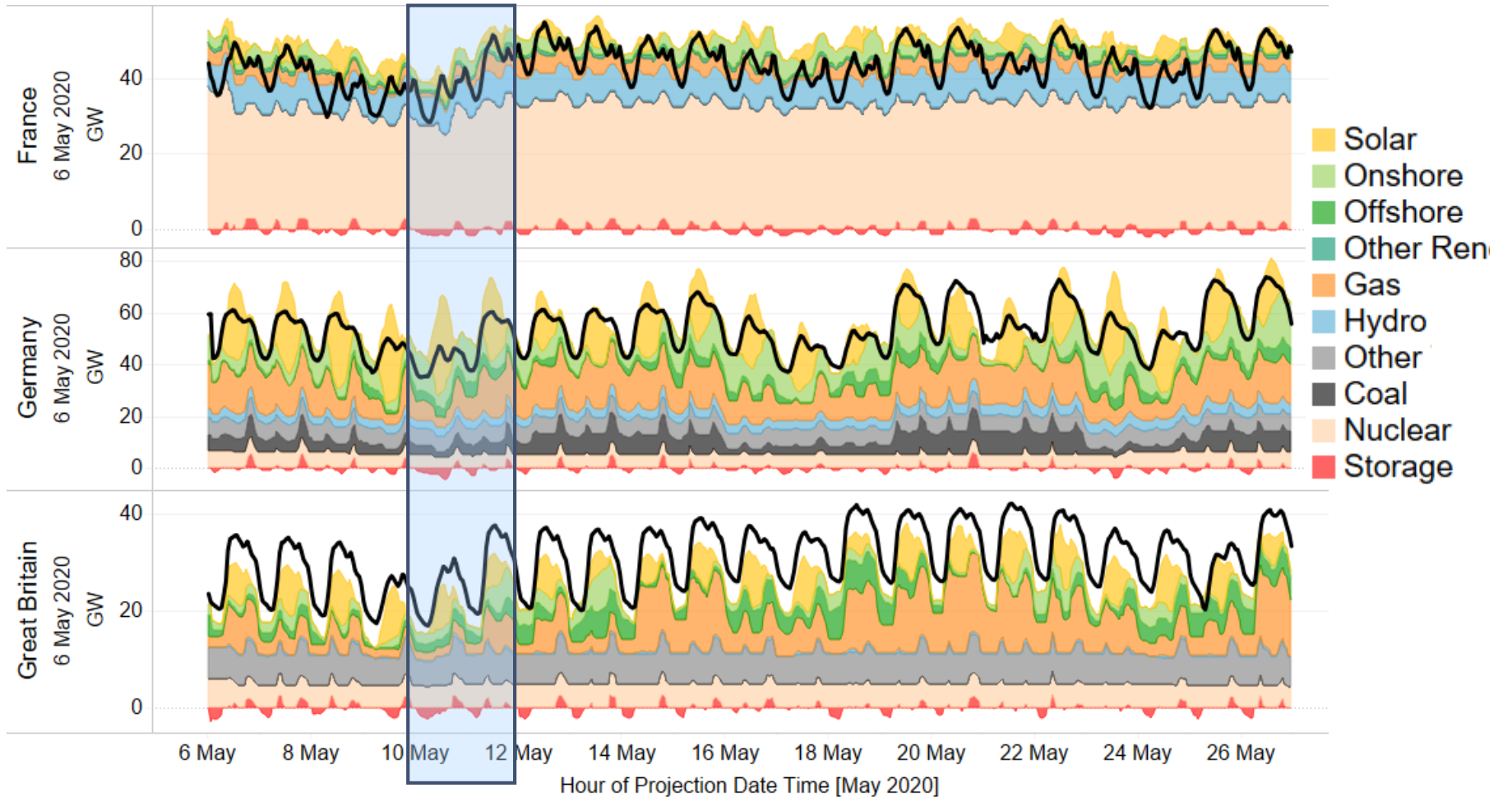
HOURLY GENERATION FOR THE REST OF MAY

BID3live has a rich output of every asset on the system, with shorter-term projections including the impact of weather

This weekend (11 May)



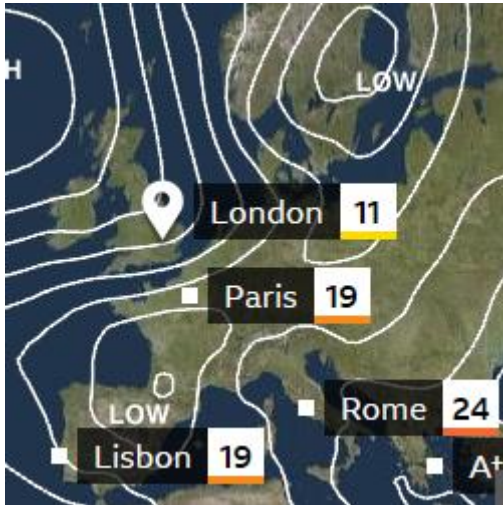
Source: bbc.co.uk



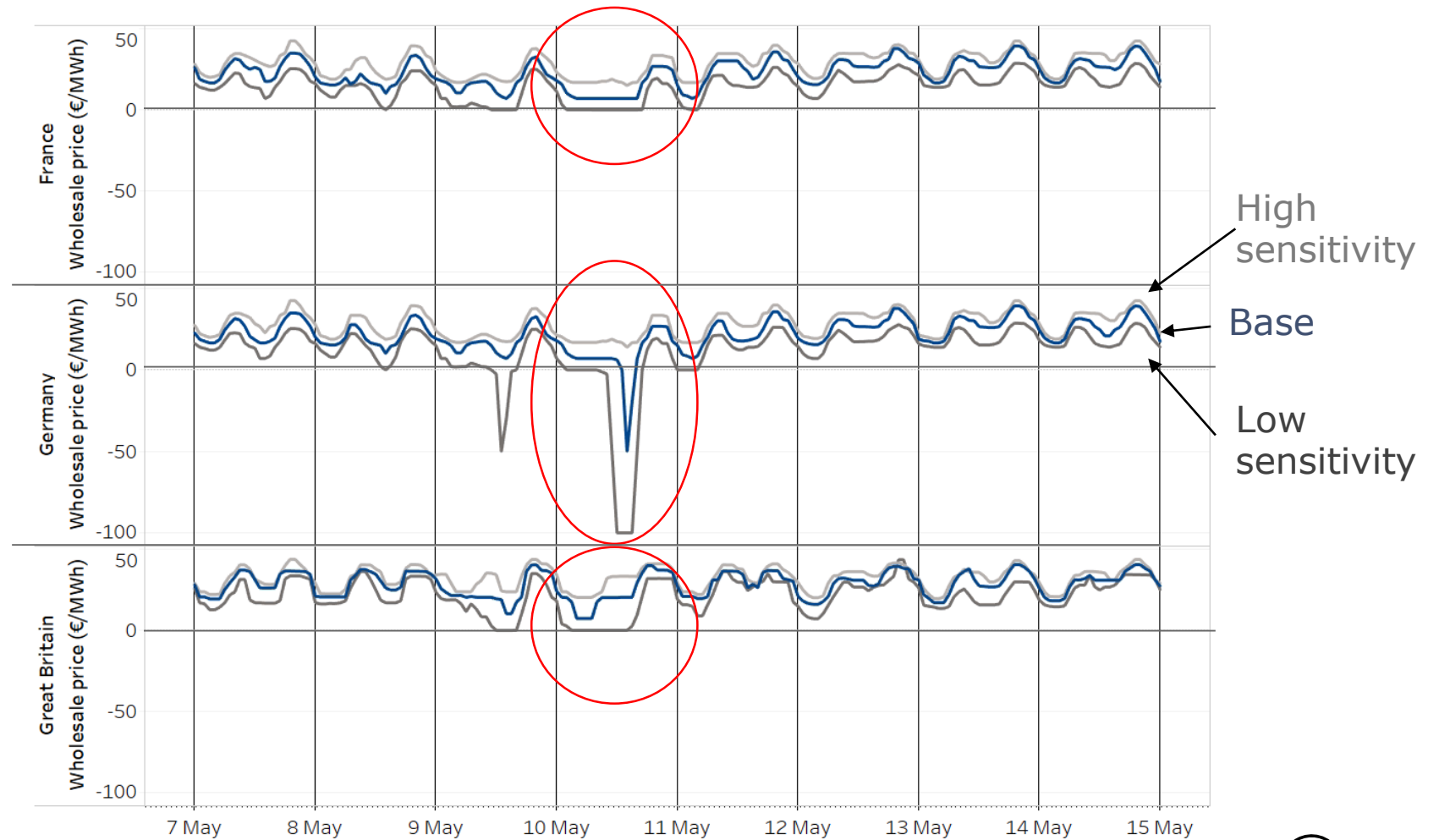
NEXT 10 DAYS - SENSITIVITY ANALYSIS

The upcoming weekend will once again be interesting - with a risk of low or highly negative prices

**This weekend (11 May)**



Source: bbc.co.uk



# Agenda

Modelling power market forwards using  
BID3live

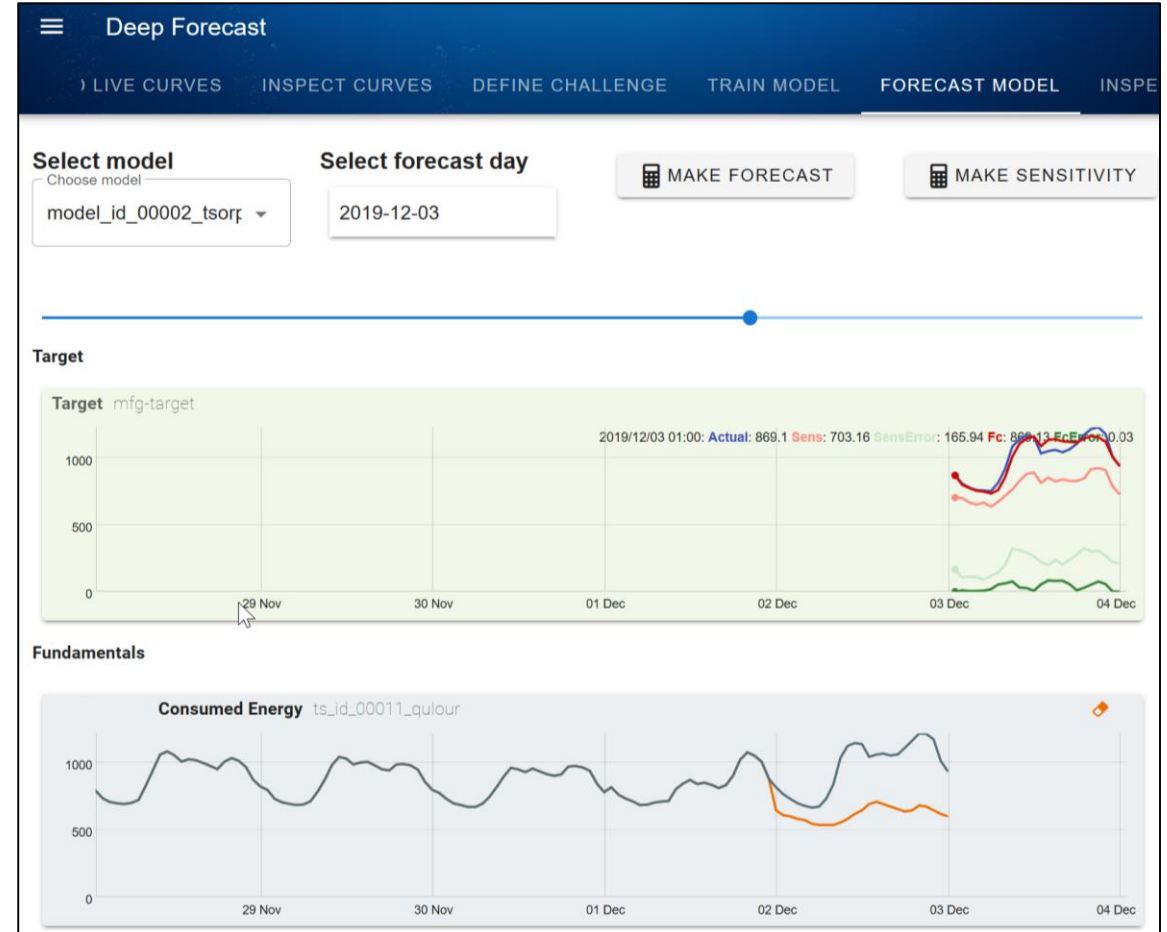
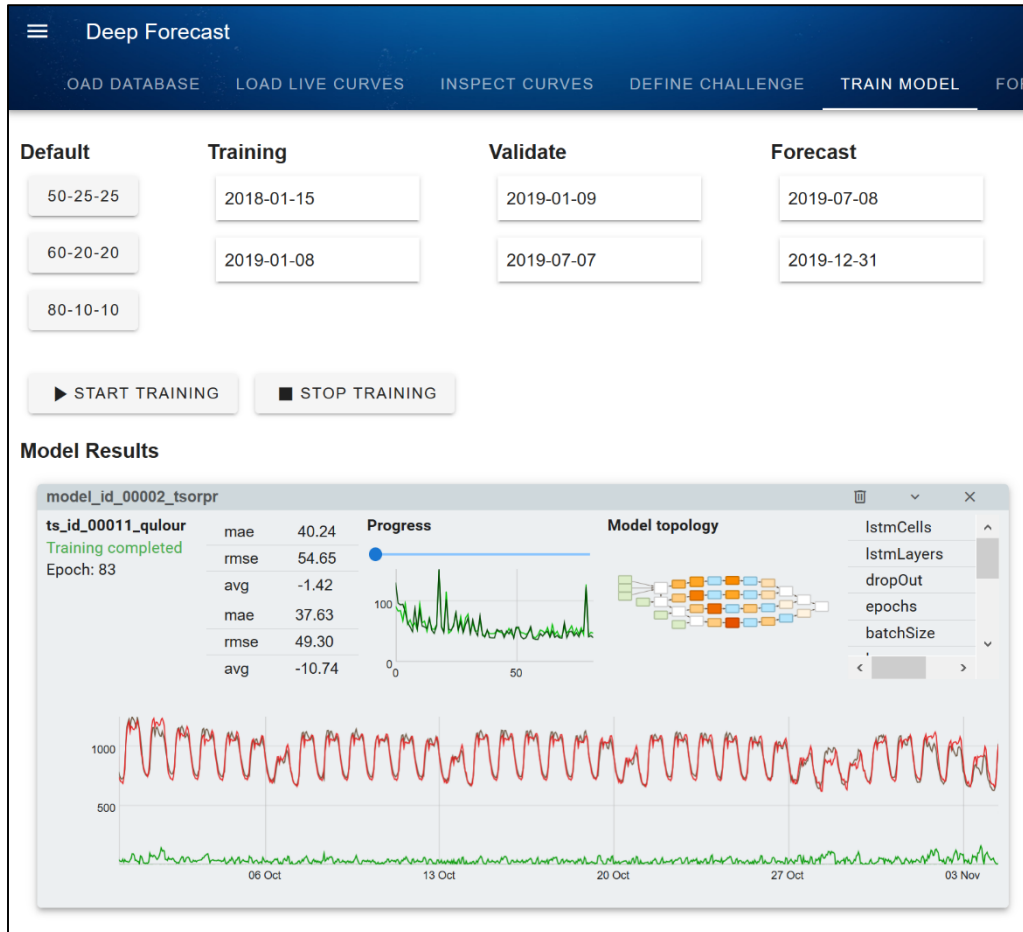
Outlook for future market prices and  
impact of COVID-19

**How AI and fundamental modelling  
together could shape the future**

Conclusions



# Combining AI techniques and fundamentals modelling could lead to the best of both worlds



# Agenda

Modelling power market forwards using  
BID3live

Outlook for future market prices and  
impact of COVID-19

How AI and fundamental modelling  
together could shape the future

## Conclusions

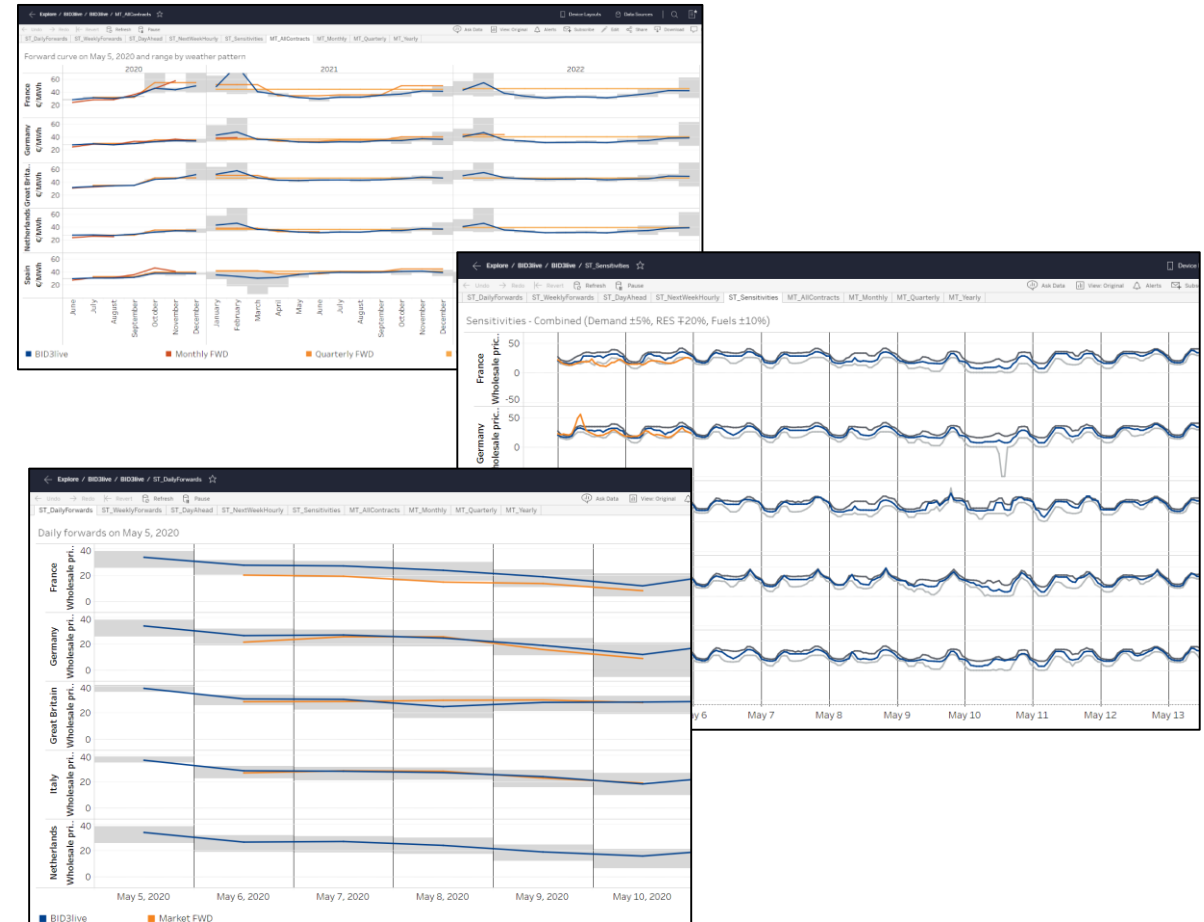


# Conclusions and next steps

- Collapse in demand, alongside gas and carbon prices, has driven short-term forwards down
- Recovery in demand is expected by the market by Aug/Sept
- Weather impact is important to model as a key driver of risk, particularly in winter
- Generation output of all plant provides insight into what will happen in the future
- This weekend shows high risk of price collapse

- 
- Trial of BID3live service for interested clients
    - Our independent view of forward curves
  - BID3 Short Term available for a fully bespoke, in-house solution

## BID3live service available for online trial



CONCLUDING REMARKS

# Contact us

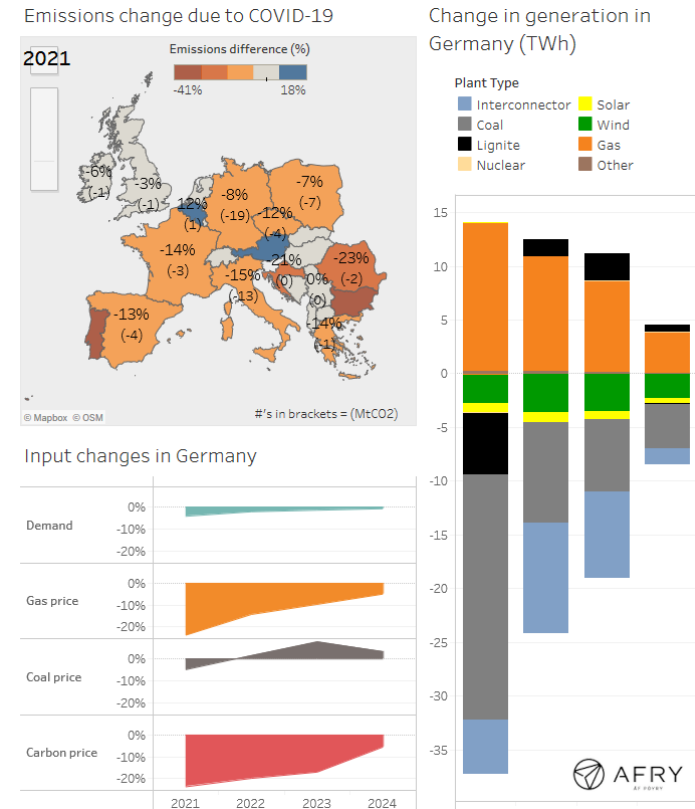
- **Contact us** for more information:  
[stephen.woodhouse@afry.com](mailto:stephen.woodhouse@afry.com)  
[james.cox@afry.com](mailto:james.cox@afry.com)  
[ovidiu.stoica@afry.com](mailto:ovidiu.stoica@afry.com)
- **More webinars** will follow with relevant topics, and any update on the evolving situation.
- Next week:

## ***E-mobility after COVID-19: challenges and opportunities***

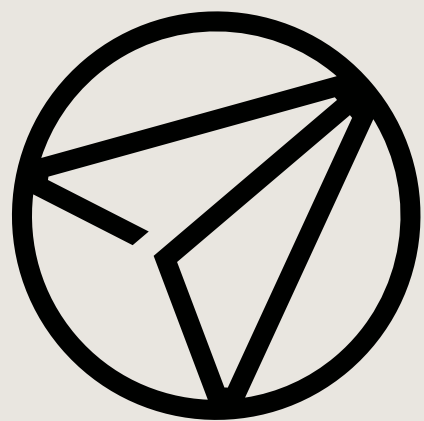
Thursday 14<sup>th</sup> May  
2pm BST / 3pm CEST

**Sign up**

For further coronavirus-related analysis, take a look at our [interactive emissions charts](#) now available







AFRY

ÅF PÖYRY