

PPA Deal Flows COVID 19 Impact on the PPA Market

Solar & Storage Finance
Digital Series

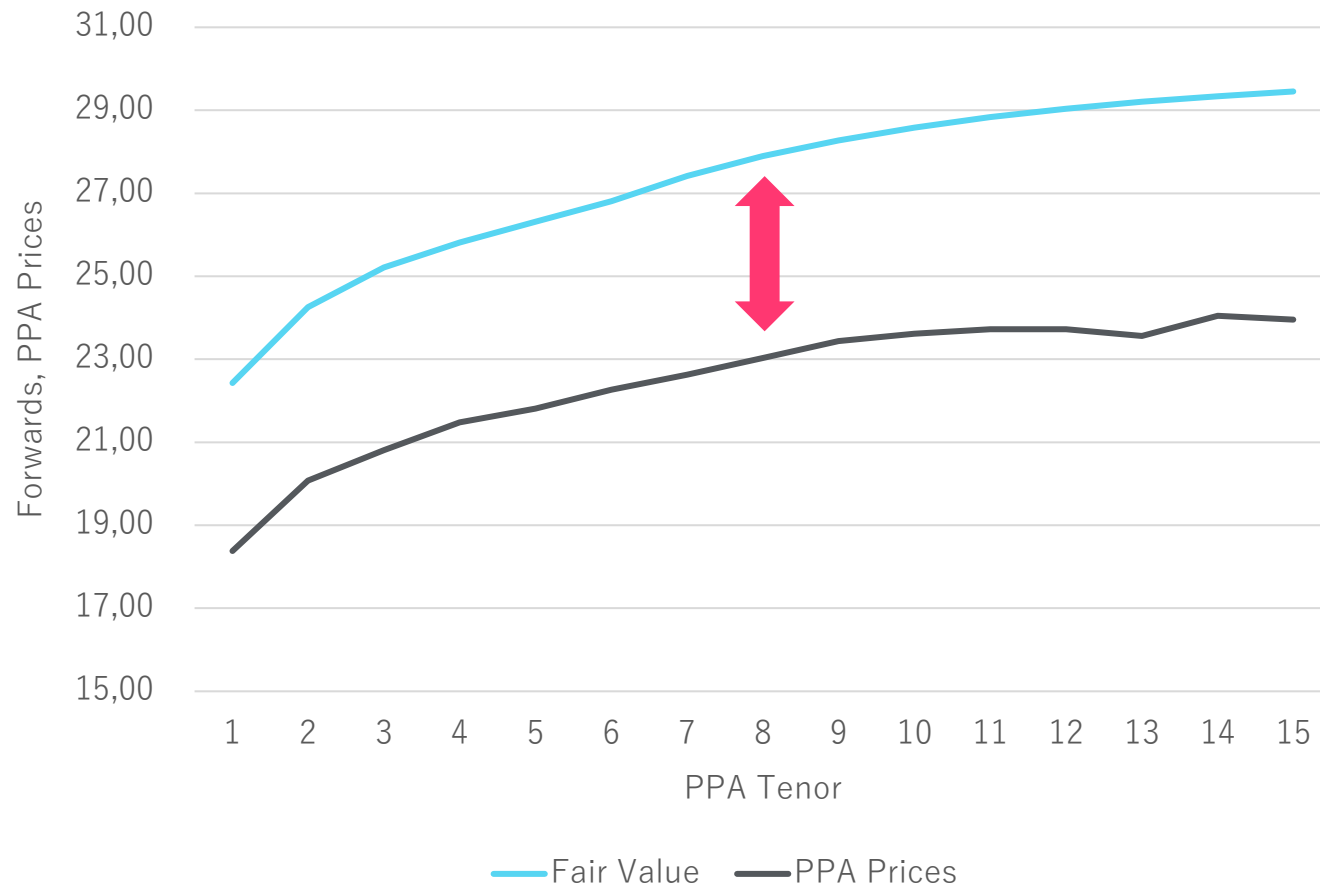
Luca Pedretti, Pexapark, June 4, 2020

PEXAPARK



PPA PRICE DRIVERS

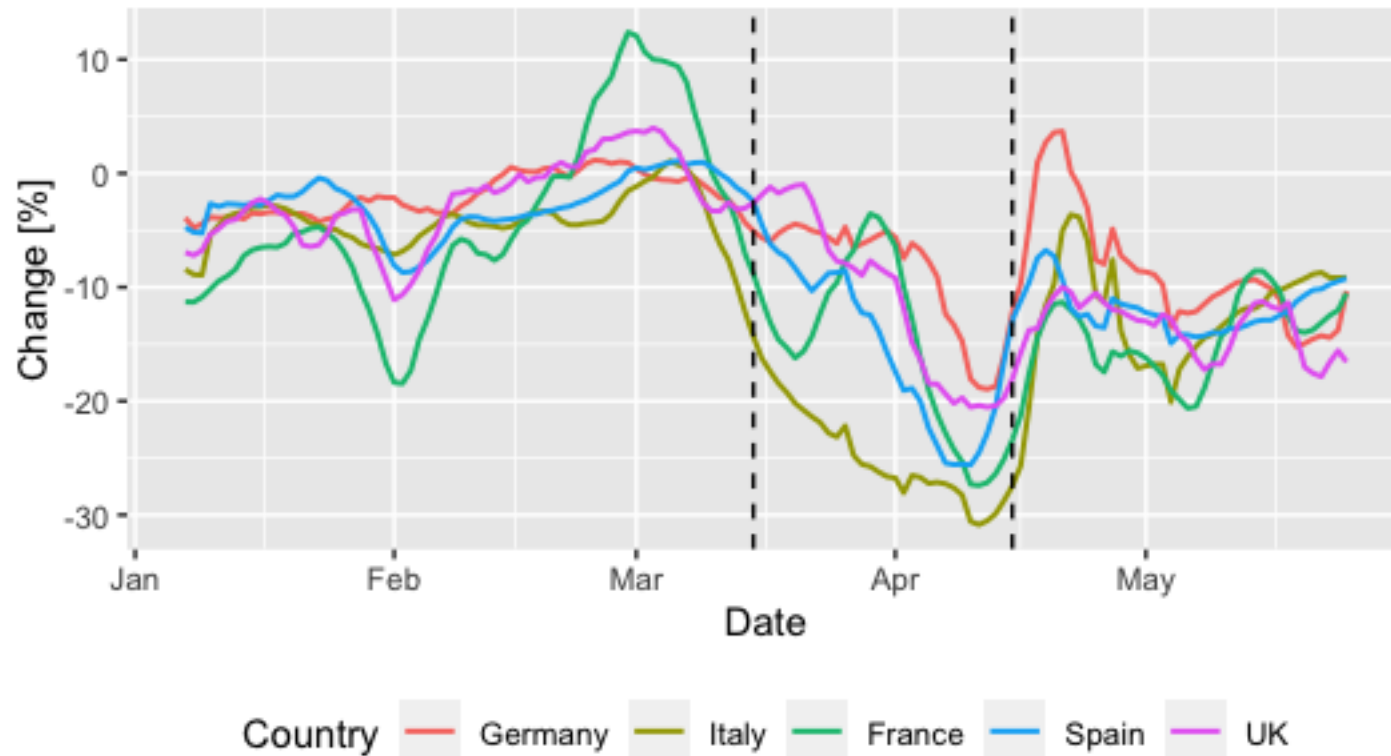
ILLUSTRATIVE



- The forward curve forms the basis of PPA pricing.
- The “PPA Discount” is formed by cost and uncertainty elements such as price volatility, curve risk, liquidity costs and PPA structure (i.e. profile and volume risk).
- Typically the overall discount increases with tenor.

IMPACT ON EUROPEAN POWER DEMAND

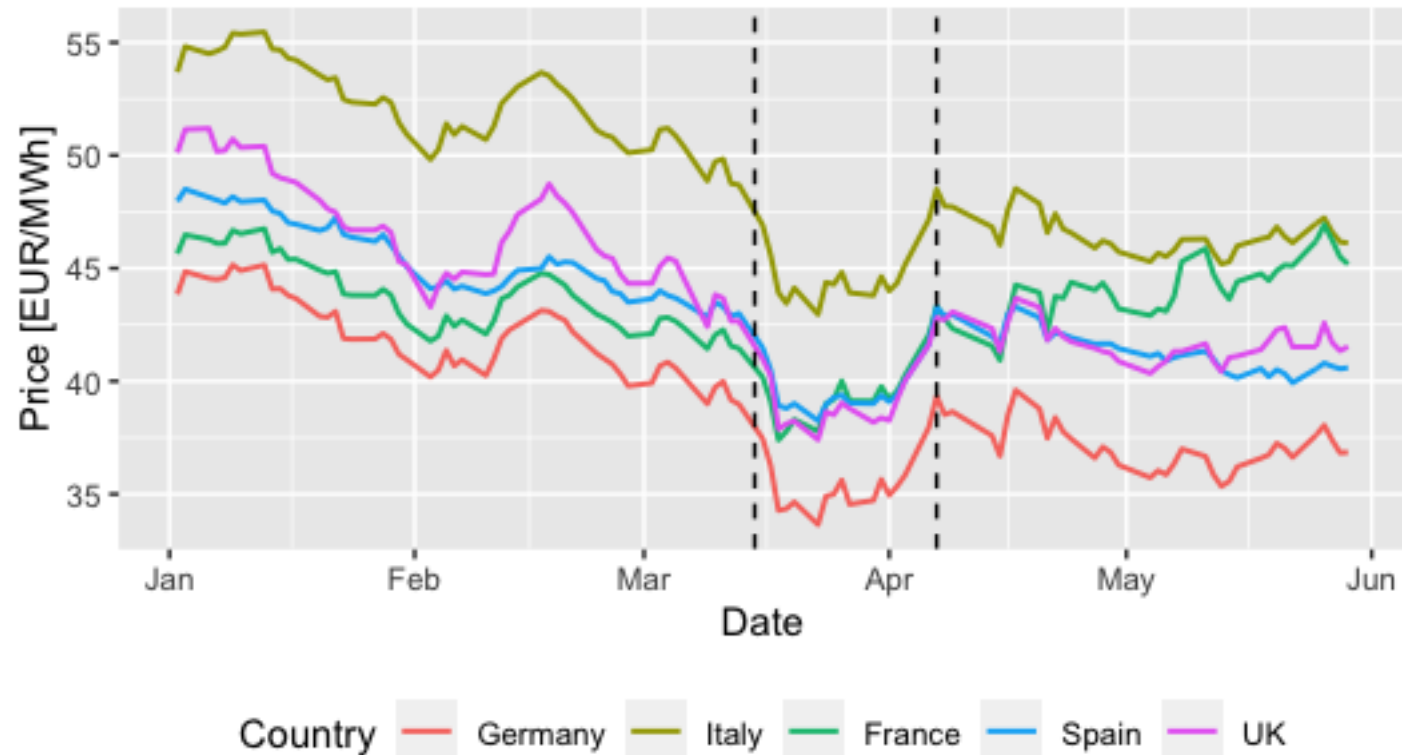
2020 demand relative to 2019



- Strict lockdowns mid-March
- Simultaneous demand reduction
- Extent of reduction correlates with severity of measures
 - FR, IT, ES by 25-30%
 - DE by 20%
- Stabilization ~10-15% reduction below seasonal normal

EUROPEAN TERM POWER PRICES

Front year prices since January 2020

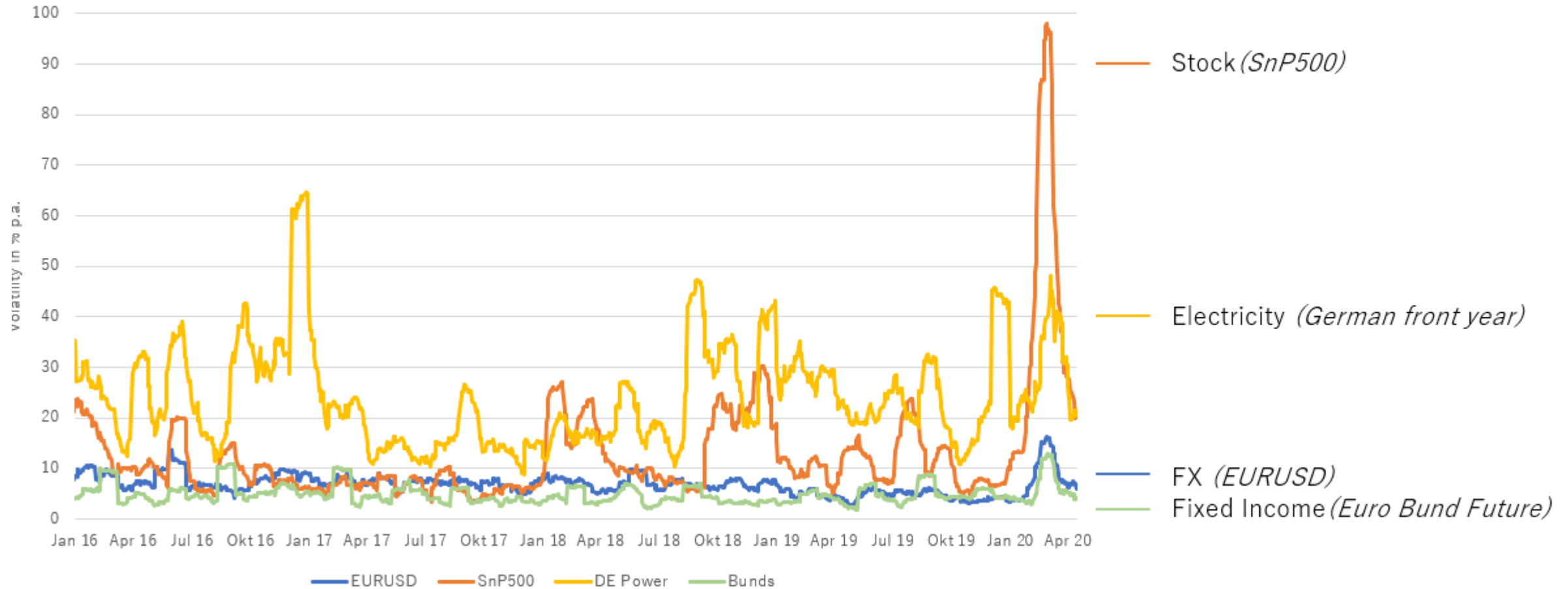


- European front year power prices drifting lower in Q1 2020
- Exacerbated by OPEC oil price war in early March
- Drastic selloff due to uncertainty about how situation might evolve
- Markets recovered beginning of April
- Sideways movement

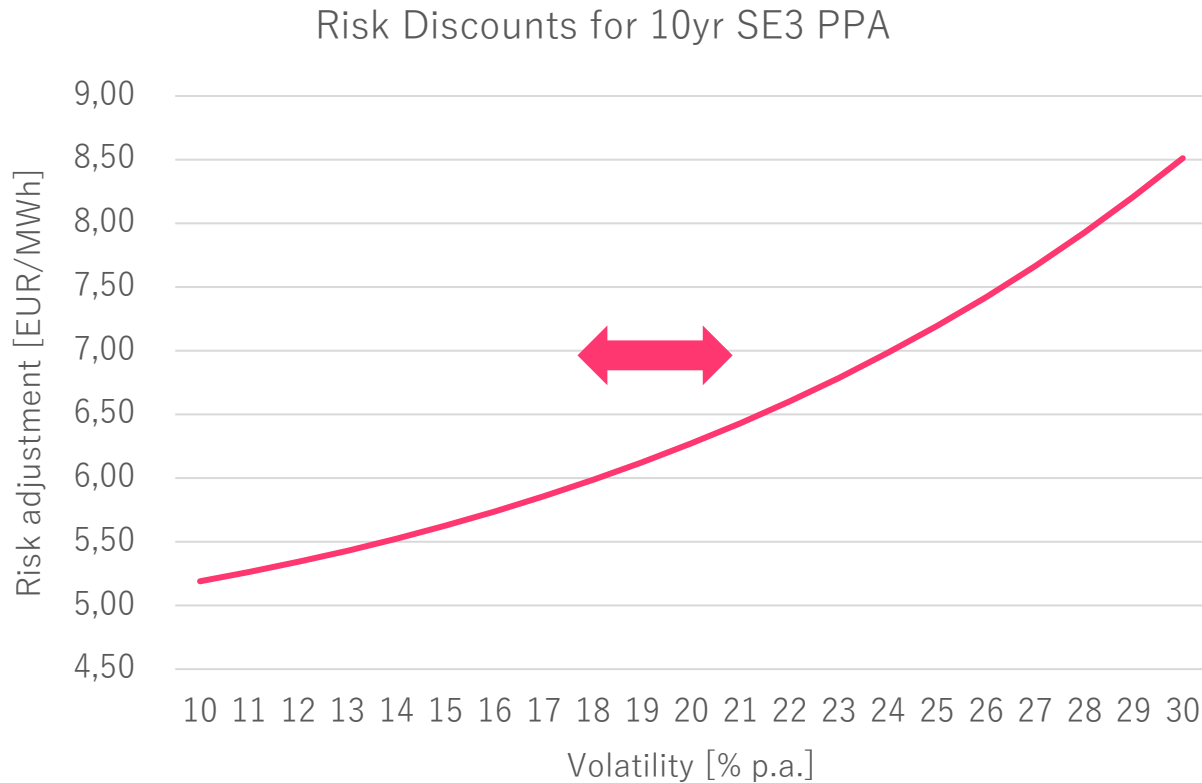
VOLATILITIES COMPARISON

Volatilities comparison between different asset classes

Annualized Realized Volatility



HOW PRICE VOLATILITY IMPACTS PPA PRICING



- Graphs shows the risk discount as a function of price volatility
- The variation of discounts is substantial
- What adjustment an offtaker will apply, is a function of individually anticipated future volatility. Depending on risk appetite, offtakers will use different assumptions

LONGTERM PPA PRICES



- PPA price indices mirrors forward price evolution
- Limited slump of indices reflected by largely unchanged contango
- Unclear yet how long-term price expectations will be affected by the crisis

FREE ACCOUNT

<https://pexapark.com/wind-solar-ppa-prices/>

PEXAPARK PPA TRACKER

PEXAQUOTE Market View PPA Prices Curves GoO Prices PPA Tracker FAQ

PPA Tracker

Countries [Belgium, Denmark, Finland, France, Ge...](#) Technologies [Battery, H...](#)

[Report a PPA Deal](#)

Date ↓	Country	Buyer	Seller	Technology	Project Size (MW)	PPA Tenor (years)	Offtaker	Benchmark Price	Denomination	
May 2020	Poland	Orange	Wpd	Onshore Wind	15	10	Corporate	48.0	EUR/MWh	Details
May 2020	Spain	Ball Corporation	Wpd	Onshore Wind	41.6	10	Corporate	38.0	EUR/MWh	Details
May 2020	Spain	Shell	Sunco Capital	Solar	83		Utility			Details
May 2020	Germany	Engie	Energiekontor AG	Solar	41.5	15	Utility	42.0	EUR/MWh	Details
Apr 2020	Great Britain	Nestlé	Ørsted	Offshore Wind	31	15	Corporate	33.0	GBP/MWh	Details
Apr 2020	Spain	Royal DSM	EDP Renewables	Solar	59		Corporate			
Mar 2020	Finland	Kemira	Statkraft	Onshore Wind		10	Corporate	30.0	EUR/MWh	Details
Feb 2020	Iceland	Reykjavik Data Center	Landsvirkjun (national power company)	Hydro	12		Corporate			
Feb 2020	Great Britain	Shell	energy provider backed by state-owned utility China Huaneng Group Co Ltd	Battery	100		Utility			Details
Feb 2020	Spain	Heineken	Iberdrola	Solar	50		Corporate			
Feb 2020	Spain	Engie	Fortia Energia	Unknown	180	11	Utility			Details
Feb 2020	Spain	Química del Cinca	Engie	Solar			Corporate			
Feb 2020	Spain	Orange	Iberdrola	Solar	328	12	Corporate			
Feb 2020	Finland	UPM Kymmene	WPD	Onshore Wind	192		Corporate	29.0	EUR/MWh	

- Reported PPA deals in Europe

May	4
Apr	2
Mar	1
Feb	12
Jan	11
Dec	14
Nov	5
Oct	13
Sep	18

FREE ACCOUNT

<https://pexapark.com/wind-solar-ppa-prices/>

THE PEXAPARK PRICE POLL

PexaQuote users asked to submit their expected December 2020 price level of the indices together with an indication of uncertainty via P90 index levels

Country	Index	Poll Index 31 Dec 2020			
	May 11	Exp %	Expected	P90	P10
Spain	34.31	+11.3%	38.19	32.10	43.31
Italy	39.35	+13.0%	44.48	36.29	56.92
Germany	36.25	+ 6.9%	38.73	32.28	47.04

Respondent Type	Expected	P90	P10
Advisors	+6.2%	-10.8%	+27.4%
Project Developers	+15.4%	+1.3%	+43.4%
Investors	+17.8%	-6.4%	+50.9%

- Respondents expect price increases across all geographies
- Advisors' average price expectations only modestly optimistic
- Project developers and investors optimistic with limited downside at P90 and considerable upside at P10



PEXAPARK

「Thank you」

MICHAEL WALDNER
CEO & CO-FOUNDER
+41 79 750 73 31
MICHAEL.WALDNER@PEXAPARK.COM

WWW.PEXAPARK.COM