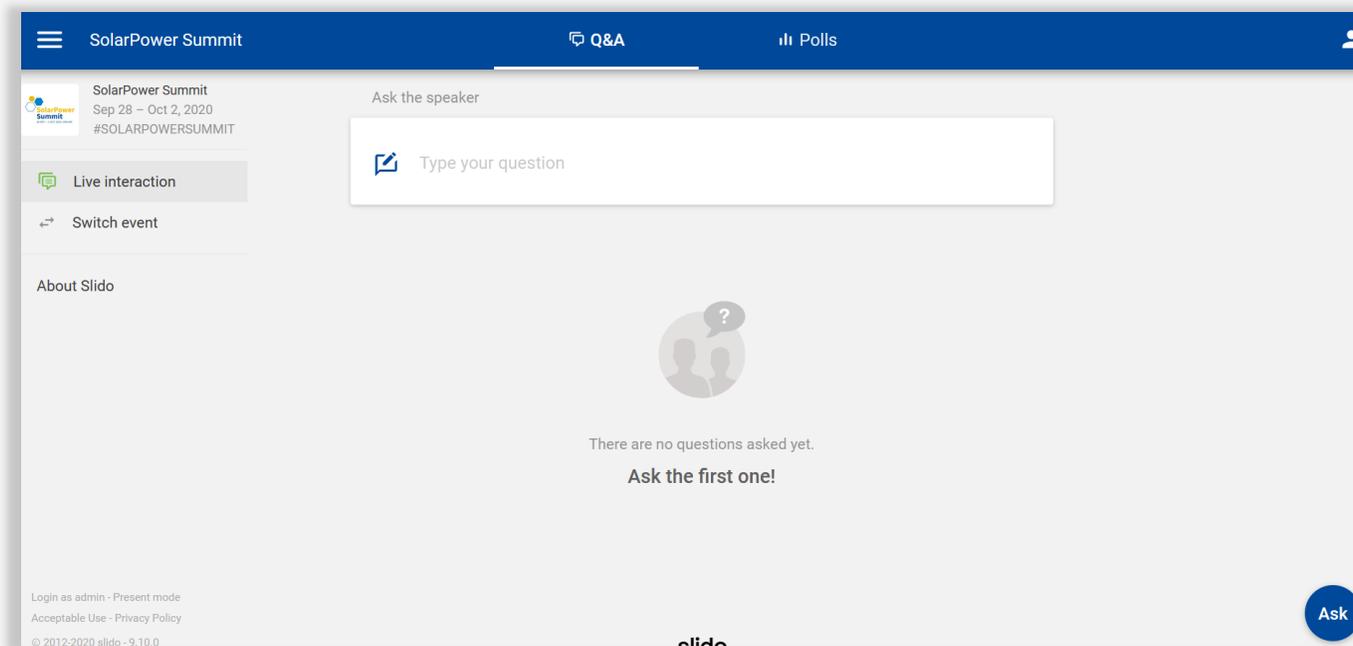


Financing solar and innovative business models in the post-subsidy era

solarpowersummit.org

How to ask questions

1. Open another browser and google **sli.do**
2. Enter the code #SOLARPOWERSUMMIT and submit your question



Financing solar and innovative business models in the post-subsidy era



Marc Oman

EU Senior Energy Lead,
Google



Alessandro Boschi

Head of Renewable Energy
Division, European Investment
Bank



Jenny Chase

Head of Solar Analysis,
BloombergNEF



Elizabeth Reid

Partner, Bird&Bird



Moritz Bernhoerster

Director Global Procurement /
Renewable Energy, Anheuser-
Busch InBev



Bryan Dufour

Strategy Manager, Renewable
Energy, UL



MODERATOR

Mercè Labordena

Senior Policy Advisor,
SolarPower Europe



Input presentation

Jenny Chase, Head of Solar
Analysis, BloombergNEF



SOLARPOWER SUMMIT 2020

Financing solar and innovative business
models in the post-subsidy era

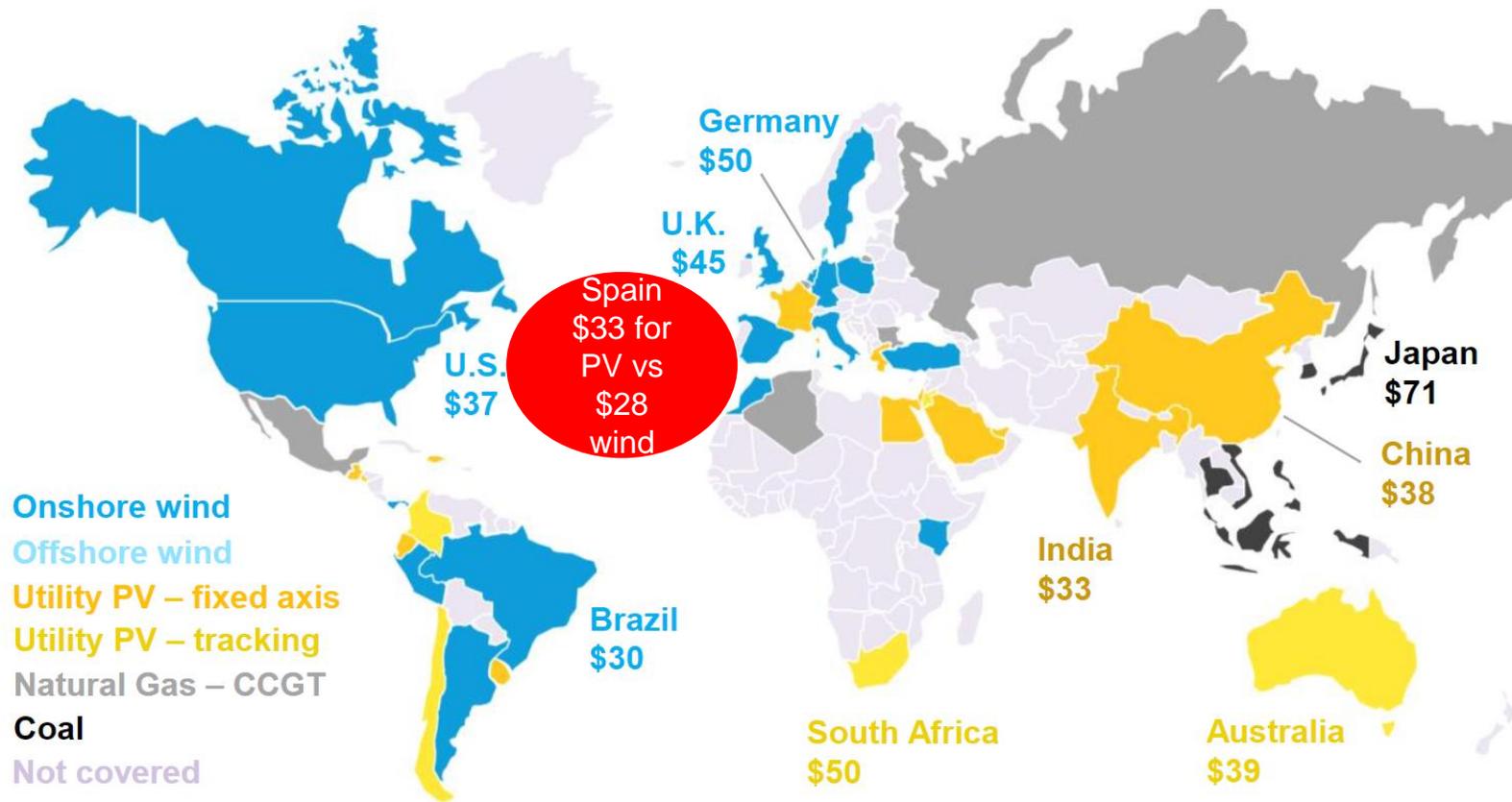
Jenny Chase

September 30, 2020

Summary

- We all know solar is cheap. Really cheap.
- Gigawatts of solar being built to sell into the merchant market in Spain, the U.S, and even Germany and the U.K.
- The recent auction in Portugal shows that grid connections are so valuable that solar and storage developers are willing to pay to get them, never mind ask for subsidies
- Do these Portuguese and merchant projects make sense? I'm hoping our other panelists can tell us.....
- Price cannibalization is almost inevitable

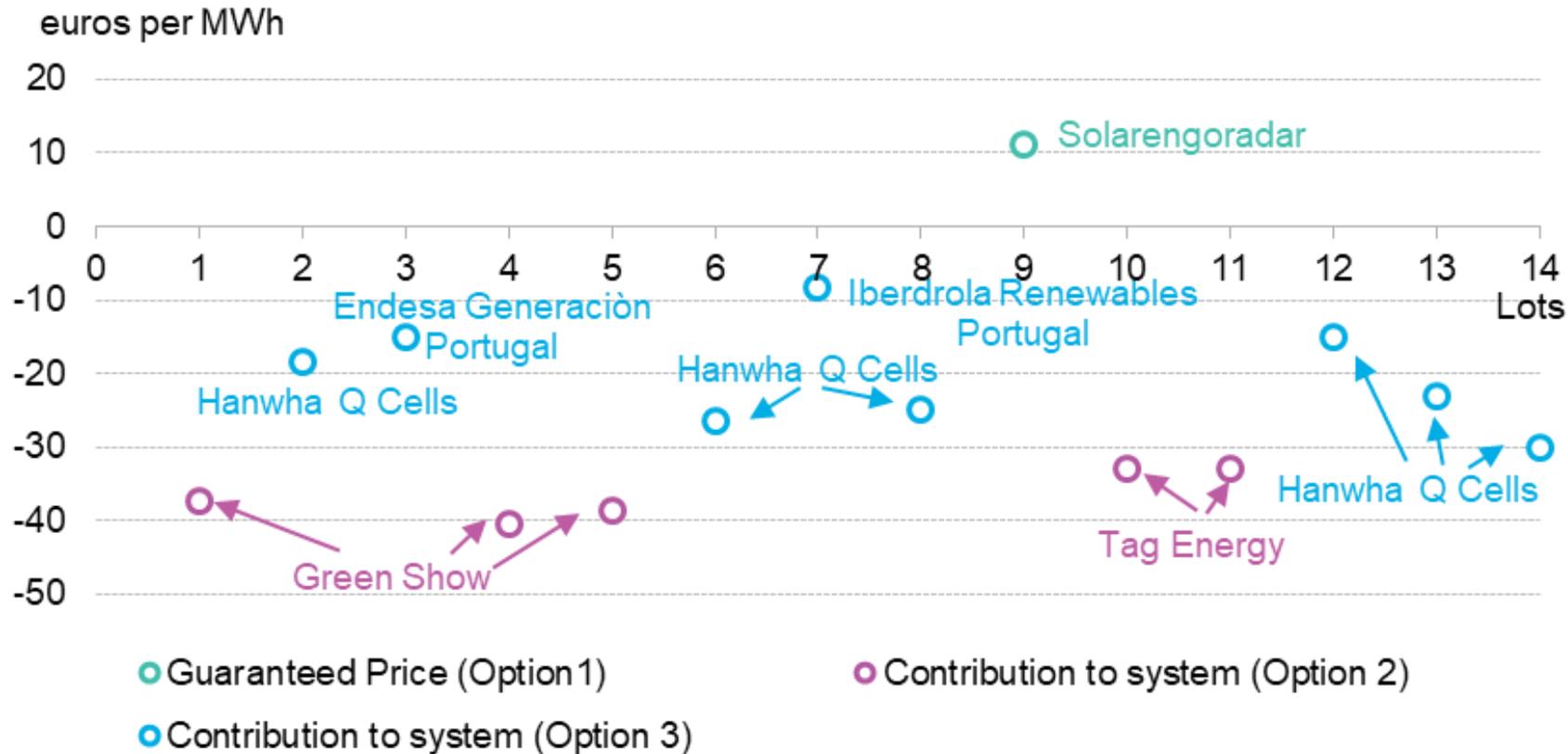
Cheapest source of new bulk generation, 1H 2020



PV or wind is now the cheapest source of bulk electricity in countries with two-thirds of the world's population and 72% of GDP

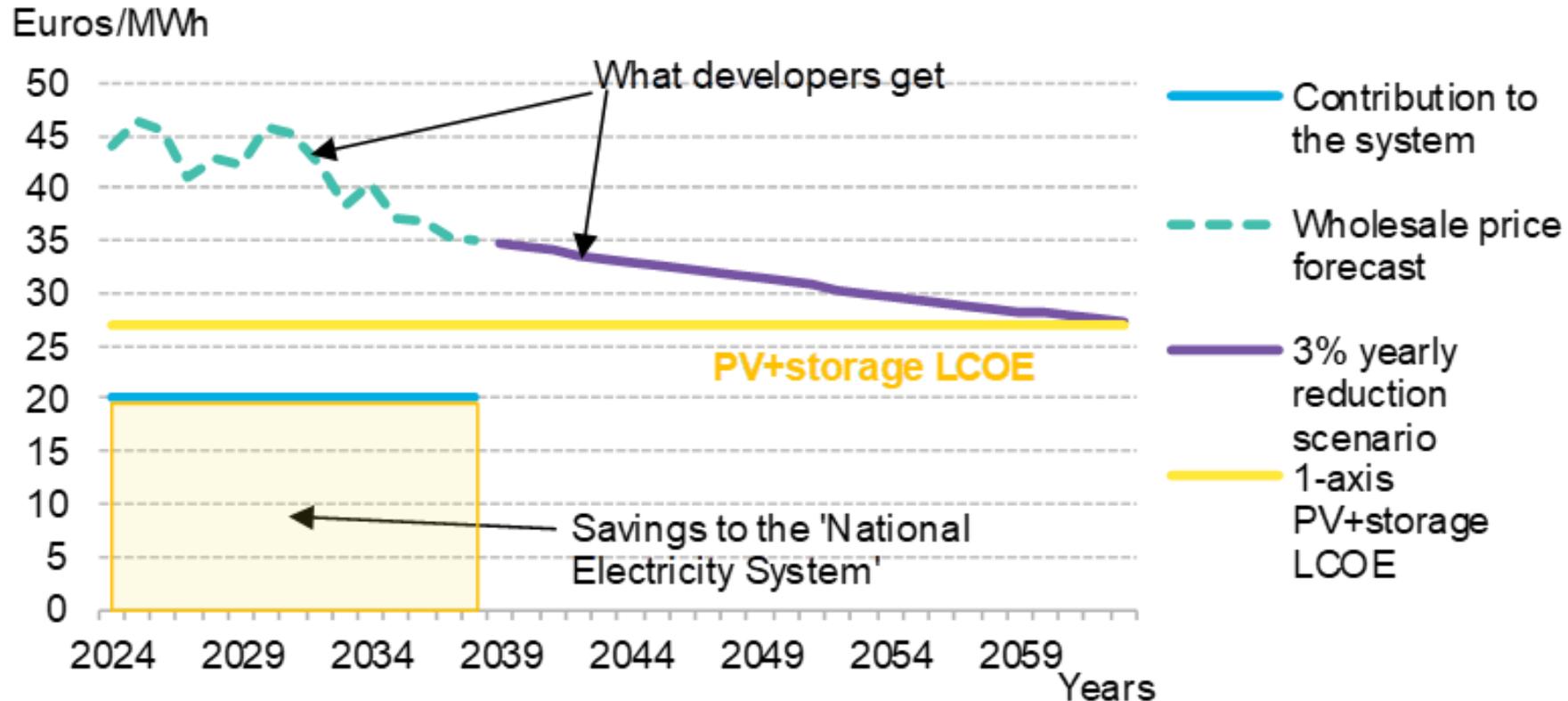
Source: BloombergNEF. Note: The map indicates for each country the technology with the lowest LCOE for new build plants. The dollar numbers below the country name denotes the per MWh benchmark levelized cost of the cheapest technology. LCOE calculations exclude subsidies, tax credit or grid connection costs. CCGT: combined cycle gas turbine.

Successful bids in Portugal's 2020 PV-plus-storage auction



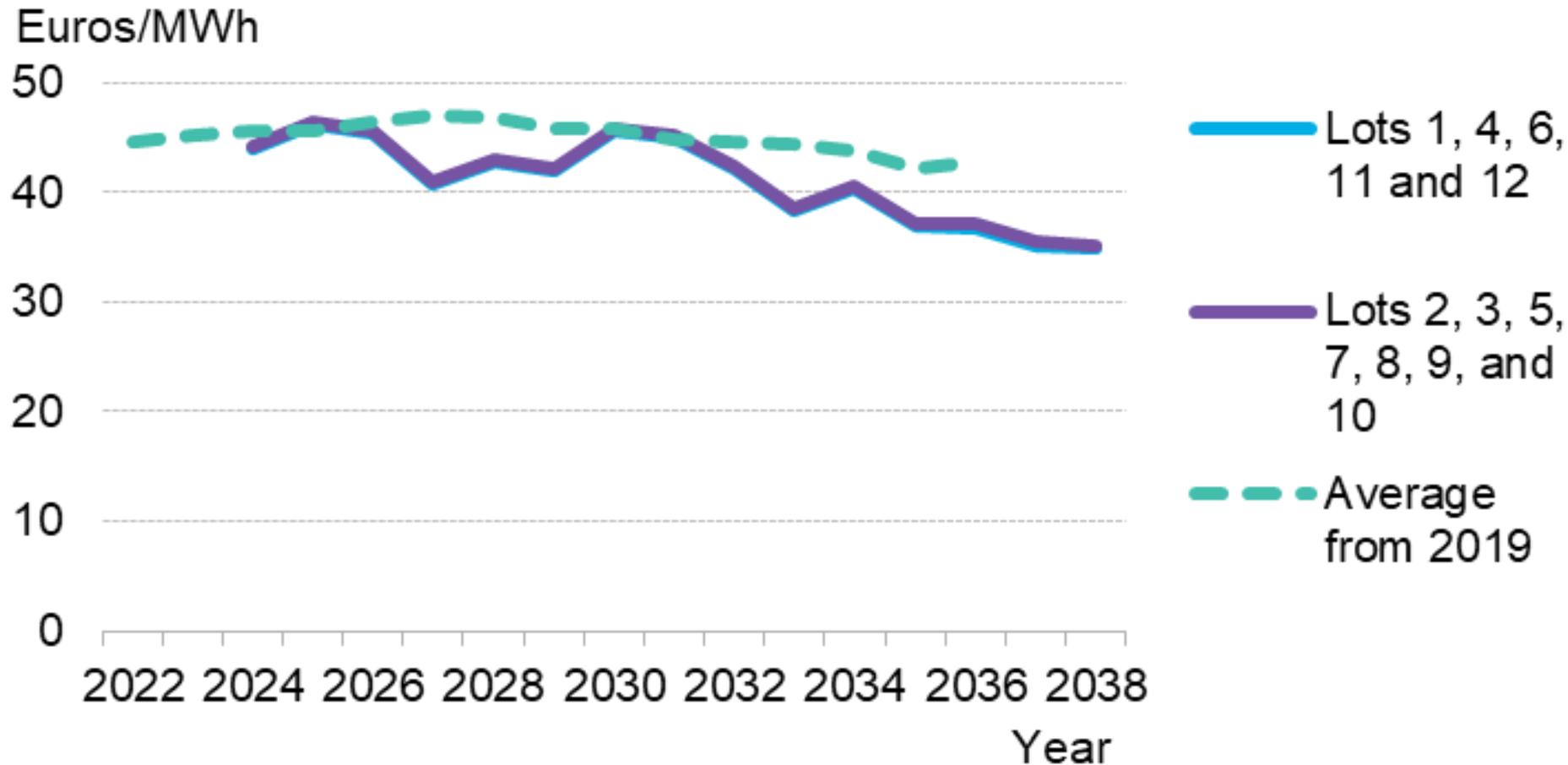
Source: BloombergNEF

Estimated project cashflows under solar + storage option in Portuguese auction



Source: BloombergNEF Note: Prices in nominal terms. Realized solar electricity prices out to 2038 are provided by Portuguese authorities. We assumed a 3% reduction in real terms between year 16 (2039) and 40 (2063), and applied a 2.05% inflation rate.

Portuguese forecast realized solar price by auction lot



Source: DGEG (Portugal Directorate General for Energy), BloombergNEF

Copyright and disclaimer

Copyright

© Bloomberg Finance L.P. 2020. This publication is the copyright of Bloomberg Finance L.P. in connection with BloombergNEF. No portion of this document may be photocopied, reproduced, scanned into an electronic system or transmitted, forwarded or distributed in any way without prior consent of BloombergNEF.

Disclaimer

The BloombergNEF ("BNEF"), service/information is derived from selected public sources. Bloomberg Finance L.P. and its affiliates, in providing the service/information, believe that the information it uses comes from reliable sources, but do not guarantee the accuracy or completeness of this information, which is subject to change without notice, and nothing in this document shall be construed as such a guarantee. The statements in this service/document reflect the current judgment of the authors of the relevant articles or features, and do not necessarily reflect the opinion of Bloomberg Finance L.P., Bloomberg L.P. or any of their affiliates ("Bloomberg"). Bloomberg disclaims any liability arising from use of this document, its contents and/or this service. Nothing herein shall constitute or be construed as an offering of financial instruments or as investment advice or recommendations by Bloomberg of an investment or other strategy (e.g., whether or not to "buy", "sell", or "hold" an investment). The information available through this service is not based on consideration of a subscriber's individual circumstances and should not be considered as information sufficient upon which to base an investment decision. You should determine on your own whether you agree with the content. This service should not be construed as tax or accounting advice or as a service designed to facilitate any subscriber's compliance with its tax, accounting or other legal obligations. Employees involved in this service may hold positions in the companies mentioned in the services/information.

The data included in these materials are for illustrative purposes only. The BLOOMBERG TERMINAL service and Bloomberg data products (the "Services") are owned and distributed by Bloomberg Finance L.P. ("BFLP") except (i) in Argentina, Australia and certain jurisdictions in the Pacific islands, Bermuda, China, India, Japan, Korea and New Zealand, where Bloomberg L.P. and its subsidiaries ("BLP") distribute these products, and (ii) in Singapore and the jurisdictions serviced by Bloomberg's Singapore office, where a subsidiary of BFLP distributes these products. BLP provides BFLP and its subsidiaries with global marketing and operational support and service. Certain features, functions, products and services are available only to sophisticated investors and only where permitted. BFLP, BLP and their affiliates do not guarantee the accuracy of prices or other information in the Services. Nothing in the Services shall constitute or be construed as an offering of financial instruments by BFLP, BLP or their affiliates, or as investment advice or recommendations by BFLP, BLP or their affiliates of an investment strategy or whether or not to "buy", "sell" or "hold" an investment. Information available via the Services should not be considered as information sufficient upon which to base an investment decision. The following are trademarks and service marks of BFLP, a Delaware limited partnership, or its subsidiaries: BLOOMBERG, BLOOMBERG ANYWHERE, BLOOMBERG MARKETS, BLOOMBERG NEWS, BLOOMBERG PROFESSIONAL, BLOOMBERG TERMINAL and BLOOMBERG.COM. Absence of any trademark or service mark from this list does not waive Bloomberg's intellectual property rights in that name, mark or logo. All rights reserved. © 2020 Bloomberg.

BloombergNEF (BNEF) is a leading provider of primary research on clean energy, advanced transport, digital industry, innovative materials, and commodities.

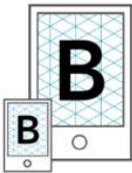
BNEF's global team leverages the world's most sophisticated data sets to create clear perspectives and in-depth forecasts that frame the financial, economic and policy implications of industry-transforming trends and technologies.

BNEF research and analysis is accessible via web and mobile platforms, as well as on the Bloomberg Terminal.

Coverage.

Clean energy
Advanced transport
Commodities
Digital industry

Get the app



On IOS + Android
about.bnef.com/mobile

BloombergNEF

Jenny Chase,
jchase12@bloomberg.net

Client enquiries:

Bloomberg Terminal: press <Help> key twice
Email: support.bnef@bloomberg.net

Learn more:

about.bnef.com | [@BloombergNEF](https://twitter.com/BloombergNEF)



Input presentation

Alessandro Boschi,
Head of Renewable Energy Division,
EIB



Financing solar and innovative business models

Solar Power Europe Summit

30 September 2020

Alessandro Boschi – Head of Renewable Energy Division - **EIB**

The EU's Climate Bank

THE EUROPEAN INVESTMENT BANK IS EUROPE'S CLIMATE BANK

€1 trillion for climate action and the environment unlocked by 2030

50 % of total financing to climate action and the environment by 2025 (current level: 30%)

2020 Fully aligned with the Paris agreement by the end of the year



What does EIB do?

LENDING

- LOANS
- GUARANTEES
- HYBRID/MEZZANINE
- EQUITY

BLENDING

- CO-FINANCING
- FINANCIAL INSTRUMENTS WITH THE EC

ADVISING

- TECHNICAL
- FINANCIAL

WHAT DO WE NOT DO?

- GRANTS
- RE-FINANCING
- M&A

SOLAR SECTOR

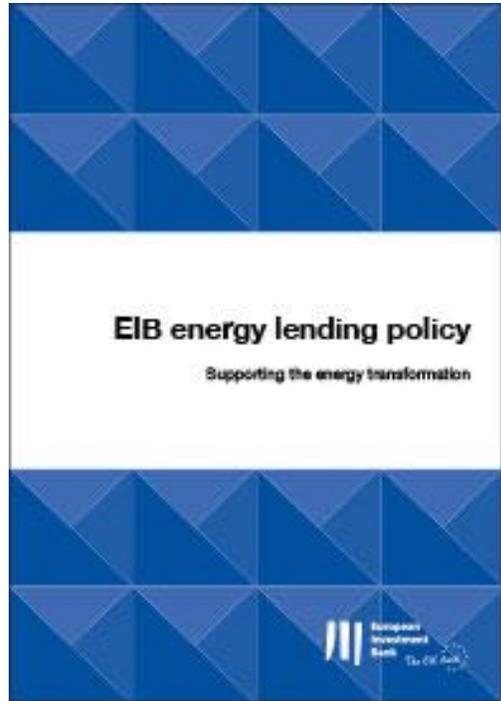
- PROJECT FINANCE
- CORPORATE LOANS
- FRAMEWORK LOANS
- EQUITY FUNDS

- EFSI, INNOVFIN
- INVESTEU
- JUST TRANSITION INITIATIVE

- EIAH
- ELENA
- JASPERS

We can however manage or provide TA in relation to grants provided by the EC (e.g. Modernization Fund)

New Energy Lending Policy - Support to solar

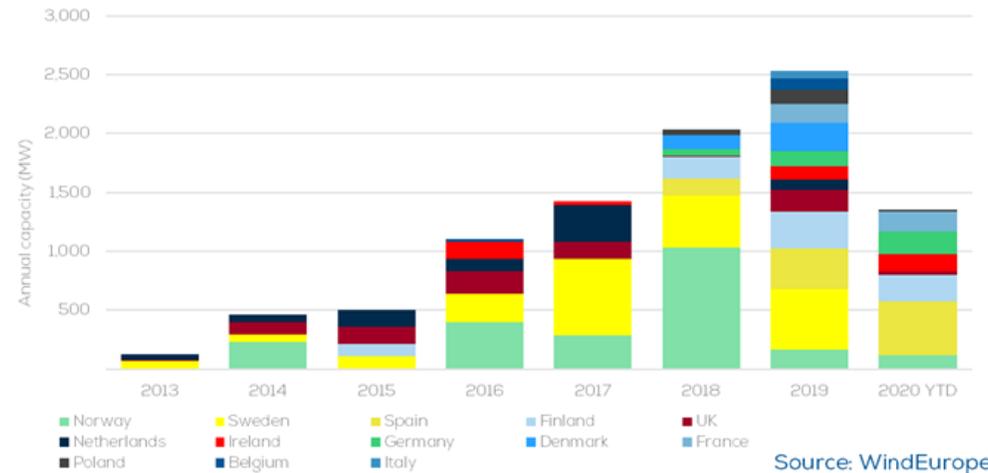


The EIB Board approved new Energy Lending Policy on 14 November 2019

<https://www.eib.org/en/publications/eib-energy-lending-policy>

- RE and solar key to decarbonization
- Solar recognized as a competitive/mature RE technology
- Large scale of the challenge particularly for solar
- Support to market integration (e.g. corporate PPAs) and new business models
- Regional cooperation, cross border schemes
- Decentralized and community schemes
- Support to RDI and innovative low carbon technologies

Commercial PPAs - growing market with some open issues



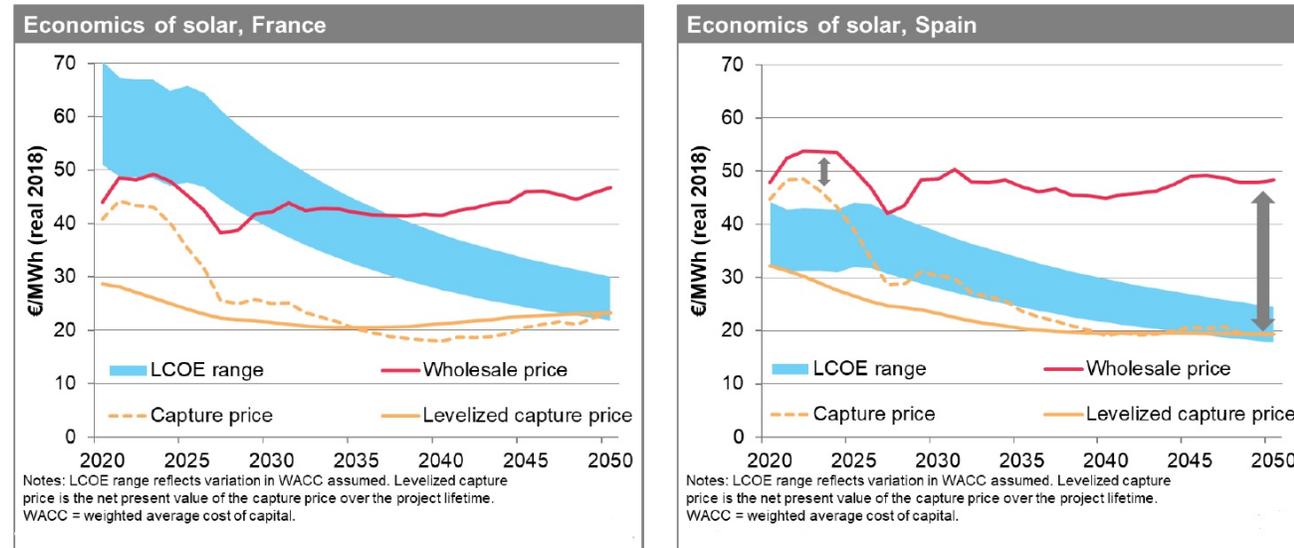
- Potentially good instrument to make projects bankable in absence of subsidies
- Ongoing study to identify the drivers and barriers for RE cPPA projects to access financing
- EIB in discussion with EC to create a dedicated thematic product under Invest EU
- Main open issues :
 - Lack of standardization and high transaction costs
 - Counterparty risk
 - Contractual conditions e.g. tenors, capture price risk, volumes etc
 - Regulatory barriers in some countries
 - COVID-19 impacts

Talayuela Solar PV in Spain (Case Study)



- Utility scale Solar PV project (Capacity: 180MW; CAPEX: 180 MEUR) on non-recourse project finance basis in Spain
- EIB support through senior debt (75MEUR) and intermediated financing (40MEUR) via commercial banks; involvement since intermediate stage of development (advise throughout contract negotiations)
- Outside regulatory support; 10 year utility PPA (fixed price) for 80% of production, 3 year merchant tail
- Promoter: PV developer, EPC contractor, investment fund

However PPAs alone may not get us there

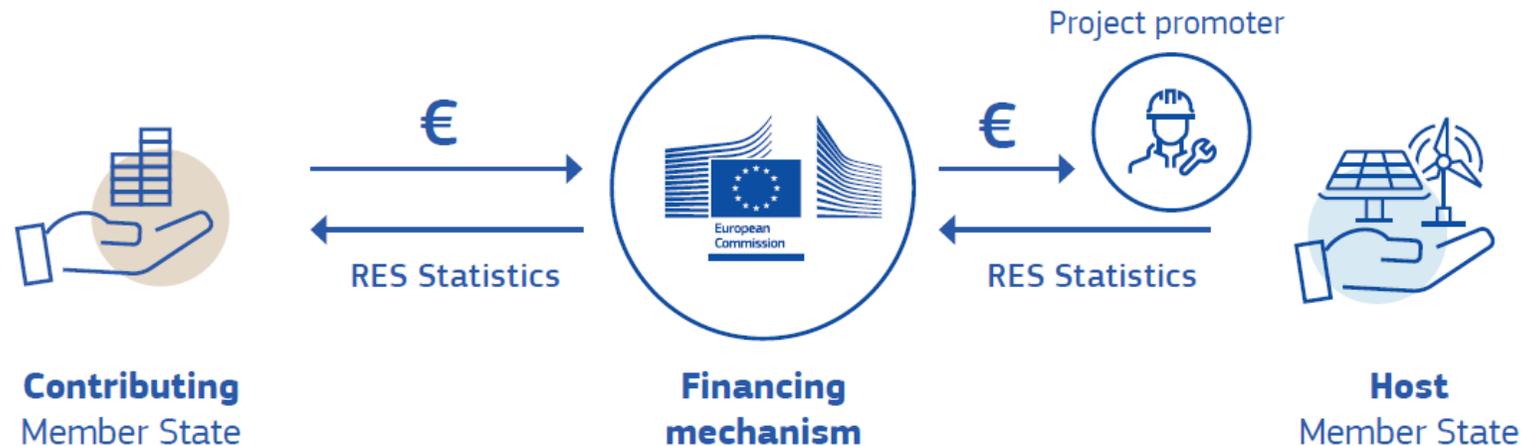


- Solar capture prices are forecasted to decrease significantly as a result of the increasing penetration of renewables
- The situation is particularly relevant for solar (as opposed to wind) because of the higher cannibalization effect
- Solar LCOEs are also expected to reduce but not at the same pace
- As a result of that public support schemes (e.g. CfDs) are likely to be necessary in order to deliver the capacity needed to meet EU targets

An innovative support scheme – the EU RE Financing Mechanism

- Cross-border cooperation foreseen by EC under the new RED2
- Consists of EU tenders organized between host/contributing MS
- Private developers can participate to tenders and receive support
- EIB can support projects applying to the EU RE Financing Mechanism

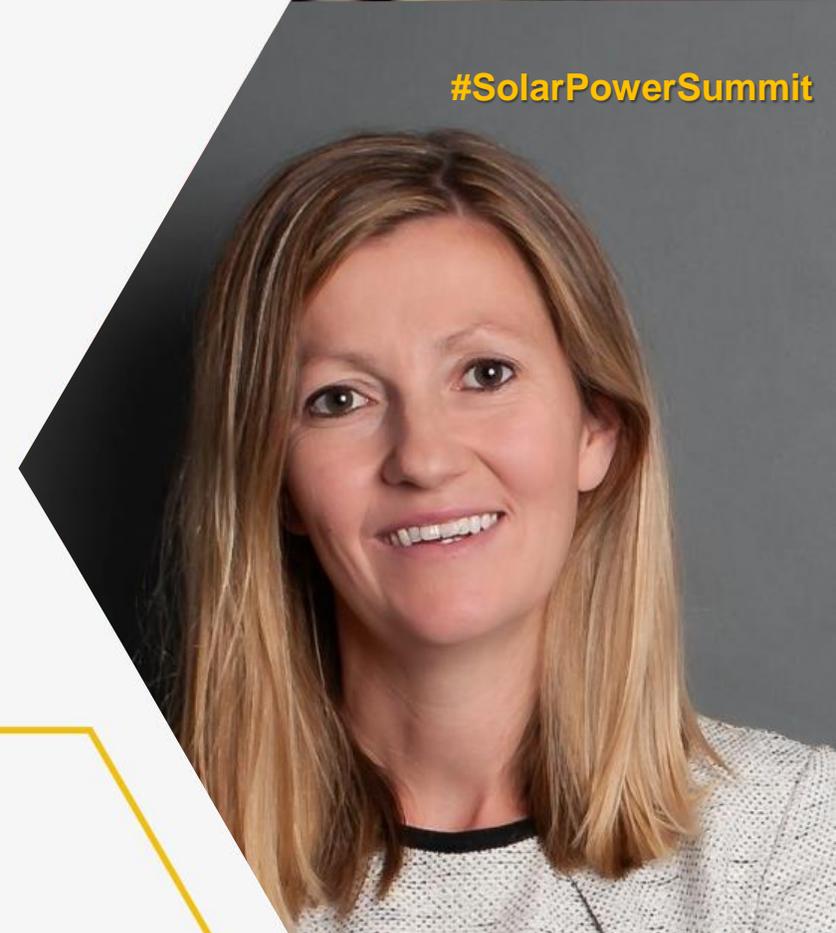
➤ Functioning of the mechanism



Thank you!

Input presentation

Elizabeth Reid, Partner, Bird&Bird





Input presentation

Marc Oman, EU Senior Energy
Lead, Google





Google

**24/7 Carbon-Free Energy
by 2030**

Google CEO Sundar Pichai announcement on 14 September 2020

Our goal:
operate carbon free

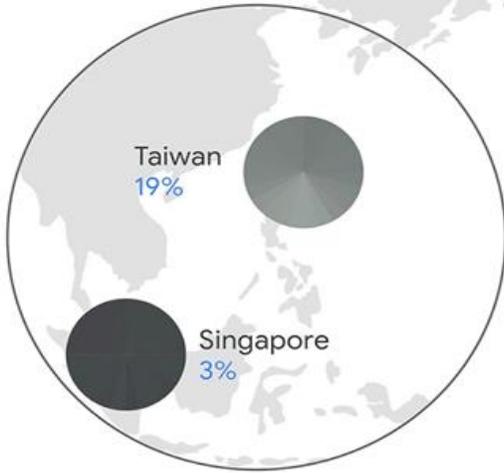


24 hours a day

7 days a week

365 days a year

Where we stand currently



Oregon 89%

Iowa 78%

Oklahoma 96%

Tennessee 55%

Alabama 55%

Virginia 41%

North Carolina 66%

South Carolina 19%

Georgia 26%

Ireland 42%

Netherlands 61%

Finland 77%

Belgium 68%

100% match with carbon-free energy



0% match with carbon-free energy

How to read clocks (example)

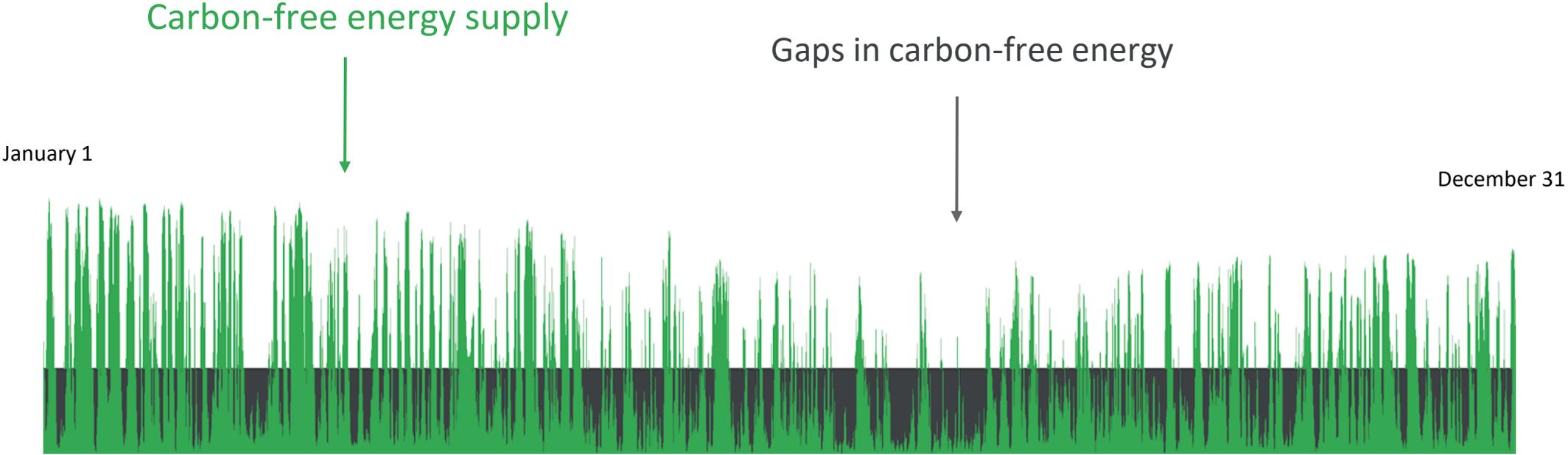


Chile 63%

Globally, performance in 2019 varies across sites; our global *hourly* clean energy average is **61%**

100% RE does not fundamentally solve the problem

Due do the variability associated with renewables, we still rely heavily on coal and gas from the grid during periods of low wind or solar

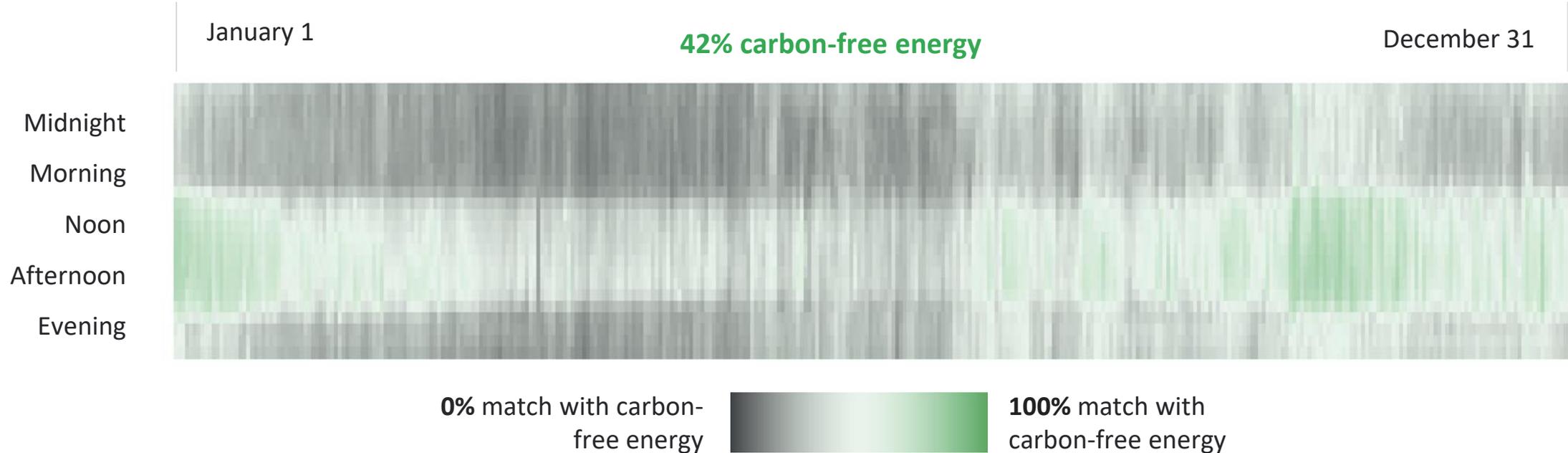


Iowa data center hour by hour (2018)

Scenario: every hour of electricity use at Chile data center

Without solar and wind PPAs, just over half our energy use in Chile would be matched with carbon-free sources on an hourly basis

Status Quo (without Google PPAs)



Actual: every hour of electricity use at Chile data center

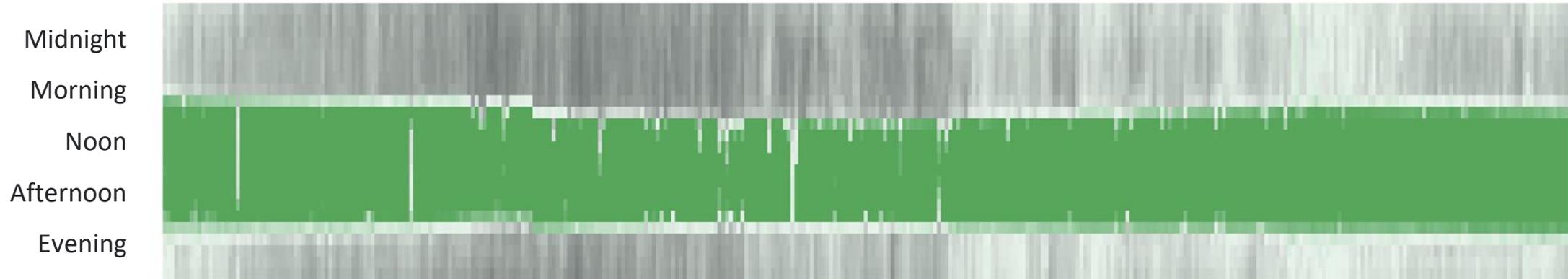
Google's first solar PPA in Chile significantly increased our data center's carbon-free matching

Actual (with 80 MW Google solar)

January 1

December 31

63% carbon-free energy



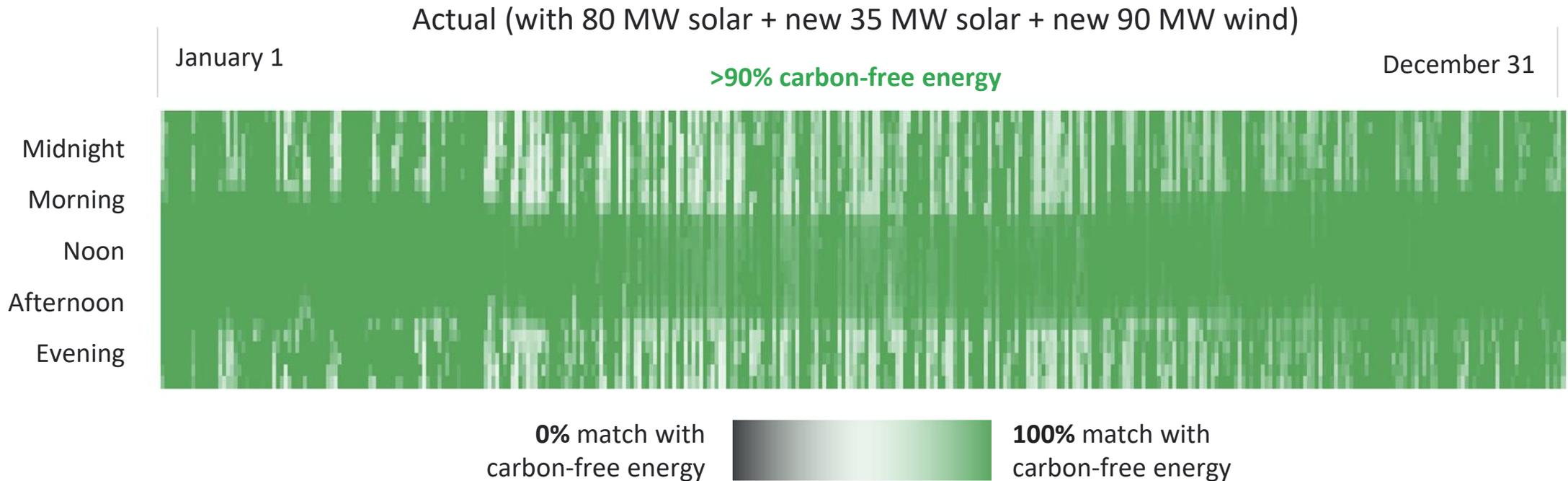
0% match with carbon-free energy



100% match with carbon-free energy

Projected: every hour of electricity use at Chile data center

A new solar + wind PPA will fill in the gaps, enabling us to match almost 100% of our electricity use with carbon-free resources on an hourly basis



We aspire to source **100%** carbon-free energy at all times



0% match with carbon-free energy



100% match with carbon-free energy



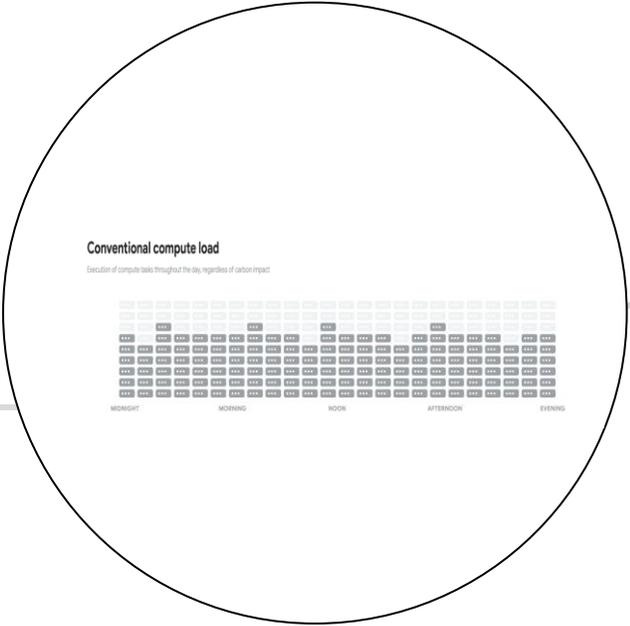
Transactions

Buy more and different types of clean energy deployed locally.



Policy

Advocating for policy changes to decarbonize electricity grids.



Technology

Accelerate technology innovation.

Input presentation

Moritz Bernhoerster, Director Global
Procurement / Renewable Energy,
Anheuser-Busch InBev



Introduction: ABInBev is the world's largest brewer with global distribution and a local footprint with incredible scale

ABInBev



We are the largest European global brewer, headquartered in Leuven, Belgium with more than 600 years of Brewing expertise

260
breweries

50+
countries

6
global zones

170,000
employees

105+
nationalities

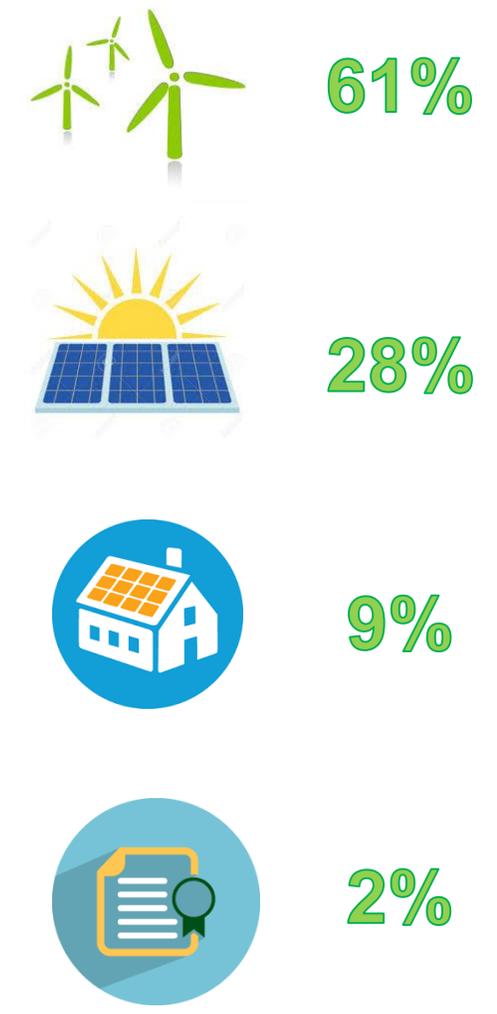
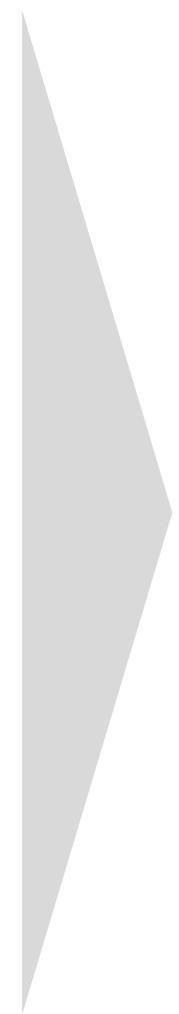
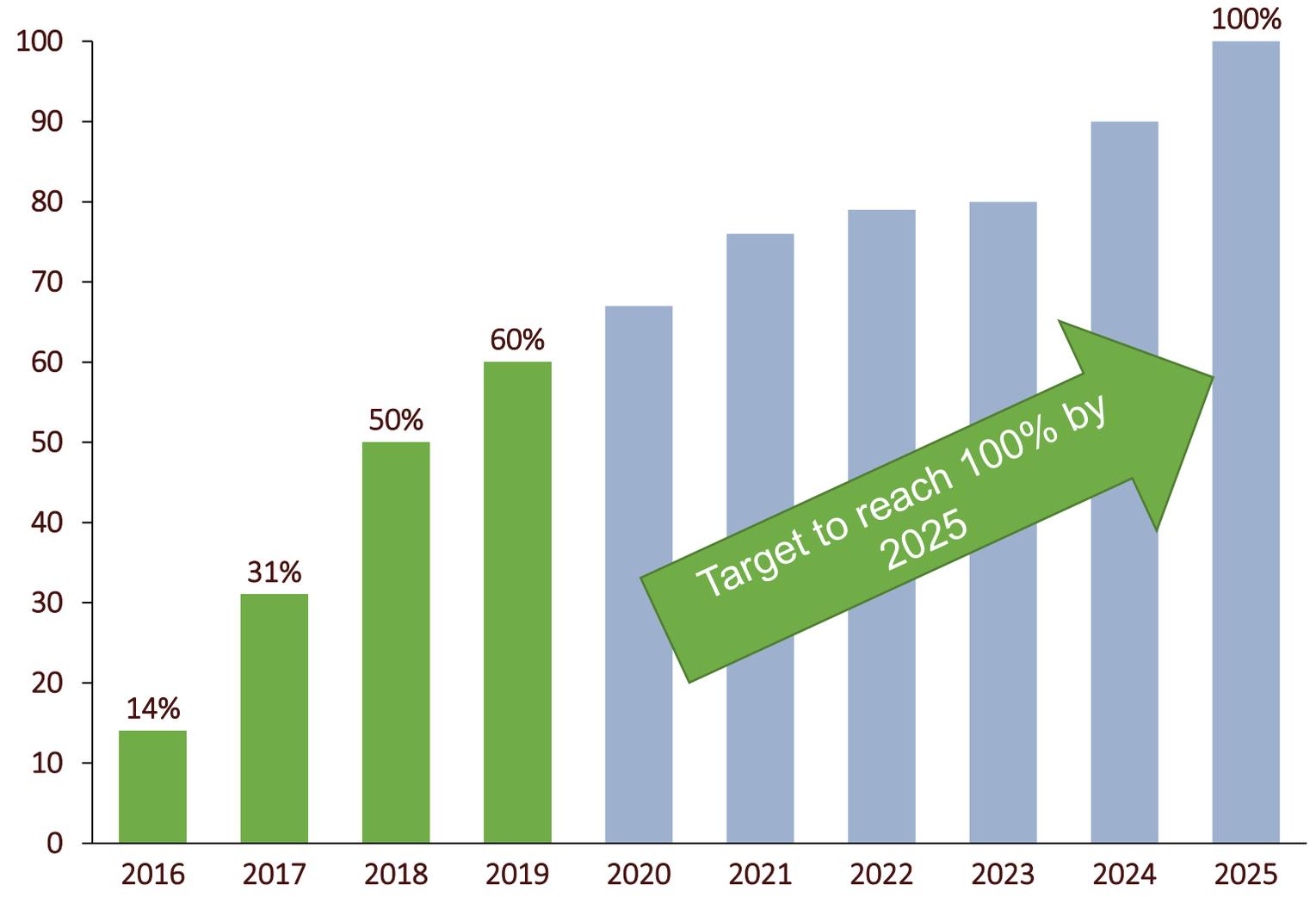
630
brands across several
beverage categories



ABInBev



2025 Goal: 100% of our purchased electricity will come from renewable sources



Budweiser will soon be brewed with renewable electricity in Europe



THIS DEAL WILL COVER:

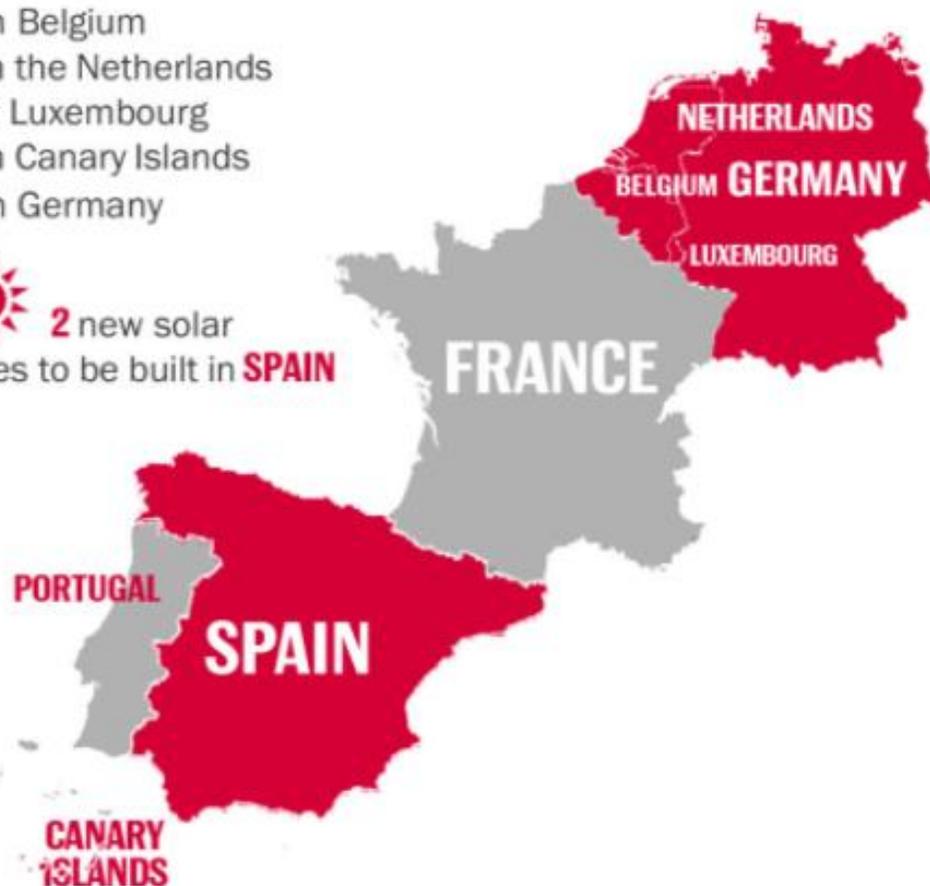


14 breweries

- 5 in Belgium
- 2 in the Netherlands
- 1 in Luxembourg
- 2 in Canary Islands
- 4 in Germany



2 new solar sites to be built in SPAIN



55_M



Kegs of beer brewed every year, including **5 MILLION** bottles of Budweiser each week.



Once solar capacity has been reached, a new logo will appear on Budweiser products, providing consumers with a simple way to choose renewables.



Input presentation

Bryan Dufour, Strategy Manager,
Renewable Energy, UL



Improving project credibility

→ Non (or limited) recourse nature of debt in project finance means that the project's creditworthiness solely relies on its expected cashflows: they should be forecastable, reliable and stable.

Different aspects of bankability:

- Project development
- CAPEX
- OPEX



Improving project credibility: CAPEX-side

→ CAPEX is ca. 80% of LCOE, and hardware is ca. 80% of CAPEX, with modules + inverters being ca. 80% of hardware cost

Rapid pace of innovation makes additional testing and inspection valuable to reinforce credibility:

- Factory inspections (IECRE OD-405 and IEC TS 62941)
- IEC 61215 as a minimum, often longer durations
- Additional performance and durability tests (abrasion/dust, LID, PID, etc.)
- LeTID for PERC!



Improving project credibility: development

→ Get the roadmap right

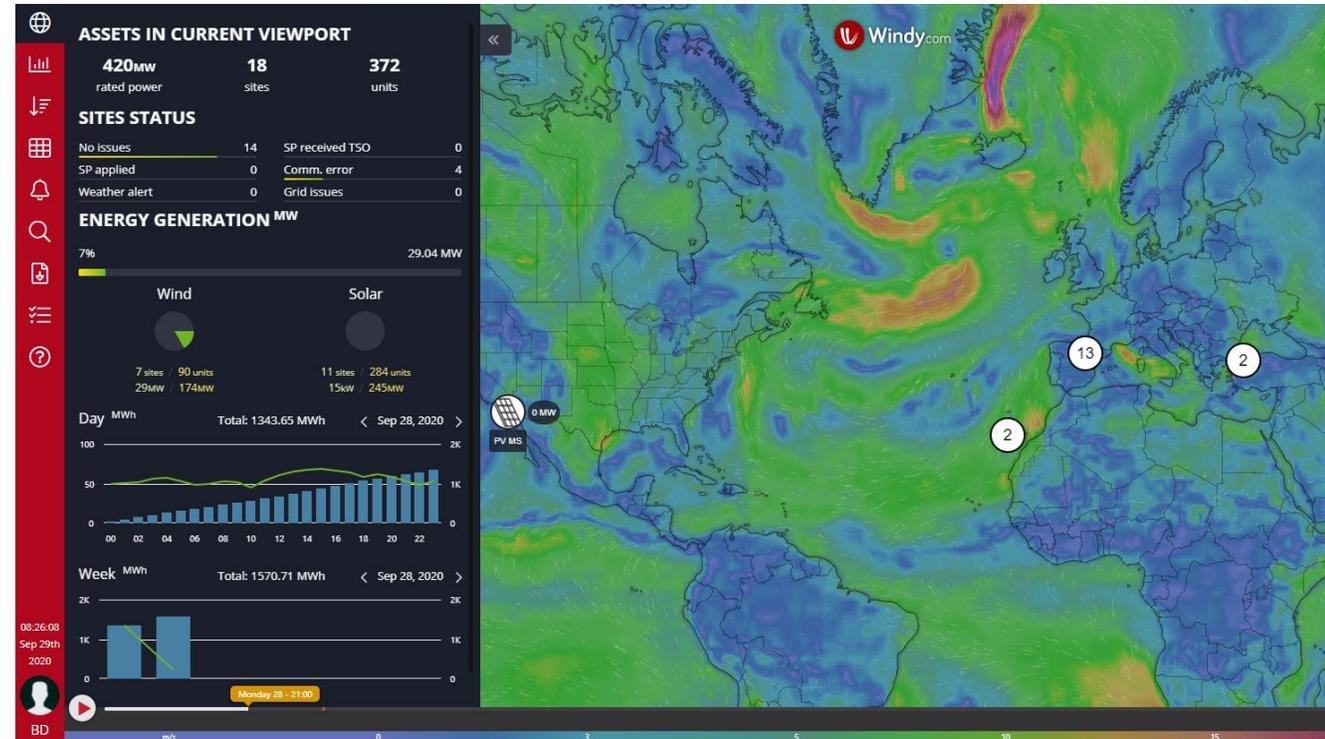
- Interconnection:
 - transmission and congestion risks under scrutiny
 - Performance ratios (beware with bifacial)
- Financial models:
 - Independently reviewed yield assessment
 - Realistic contingencies (typically underestimated for EPC and O&M)
 - Degradation rates (beware of module-implied system degradation)
- Power plant certification?
- Offtake strategies: focus is on offtakers' creditworthiness



Optimizing revenue models

→ In a post-subsidized era, merchant exposure will become the norm

- Offset merchant risk
- Combined PV and storage (load shifting, but also ancillary services)
- Microgrids and virtual power plants
- PV monitoring and analytics



Financing solar and innovative business models in the post-subsidy era



Marc Oman

EU Senior Energy Lead,
Google



Alessandro Boschi

Head of Renewable Energy
Division, European Investment
Bank



Jenny Chase

Head of Solar Analysis,
BloombergNEF



Elizabeth Reid

Partner, Bird&Bird



Moritz Bernhoerster

Director Global Procurement /
Renewable Energy, Anheuser-
Busch InBev



Bryan Dufour

Strategy Manager, Renewable
Energy, UL



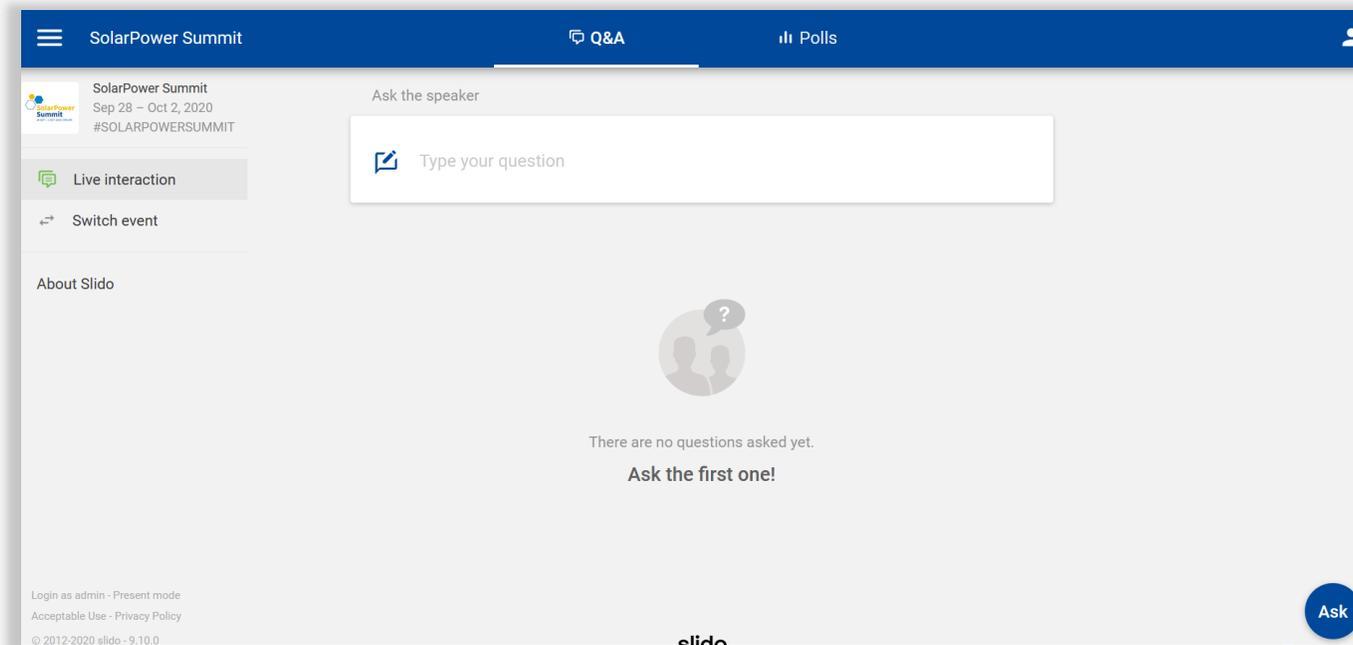
MODERATOR

Mercè Labordena

Senior Policy Advisor,
SolarPower Europe

How to ask questions

1. Open another browser and google **sli.do**
2. Enter the code #SOLARPOWERSUMMIT and submit your question



#SolarPowerSummit



28 SEP — 2 OCT 2020 | ONLINE

solarpowersummit.org