

2019 PORTUGAL RENEWABLE SUMMIT

Da transição ao compromisso energético
From transition to energy commitment





SMARTENERGY



Bernardo Mota Veiga

Chief Strategy Officer

**Investing in solar in
Portugal, the prospect of a
developer operating in the
European Market**



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A decorative graphic on the left side of the slide consisting of several thick, curved lines in various colors (yellow, light blue, orange, red, dark blue, green) that sweep upwards and to the right, creating a sense of movement and energy.

The prospect of a Developer operating in the European Market



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Past as driver for the future

Debriefing FIT programs

From FIT towards Grid Parity

Grid Parity then what?

New Policy Trend

Predicting the Future in Portugal

Portuguese Market Evolution

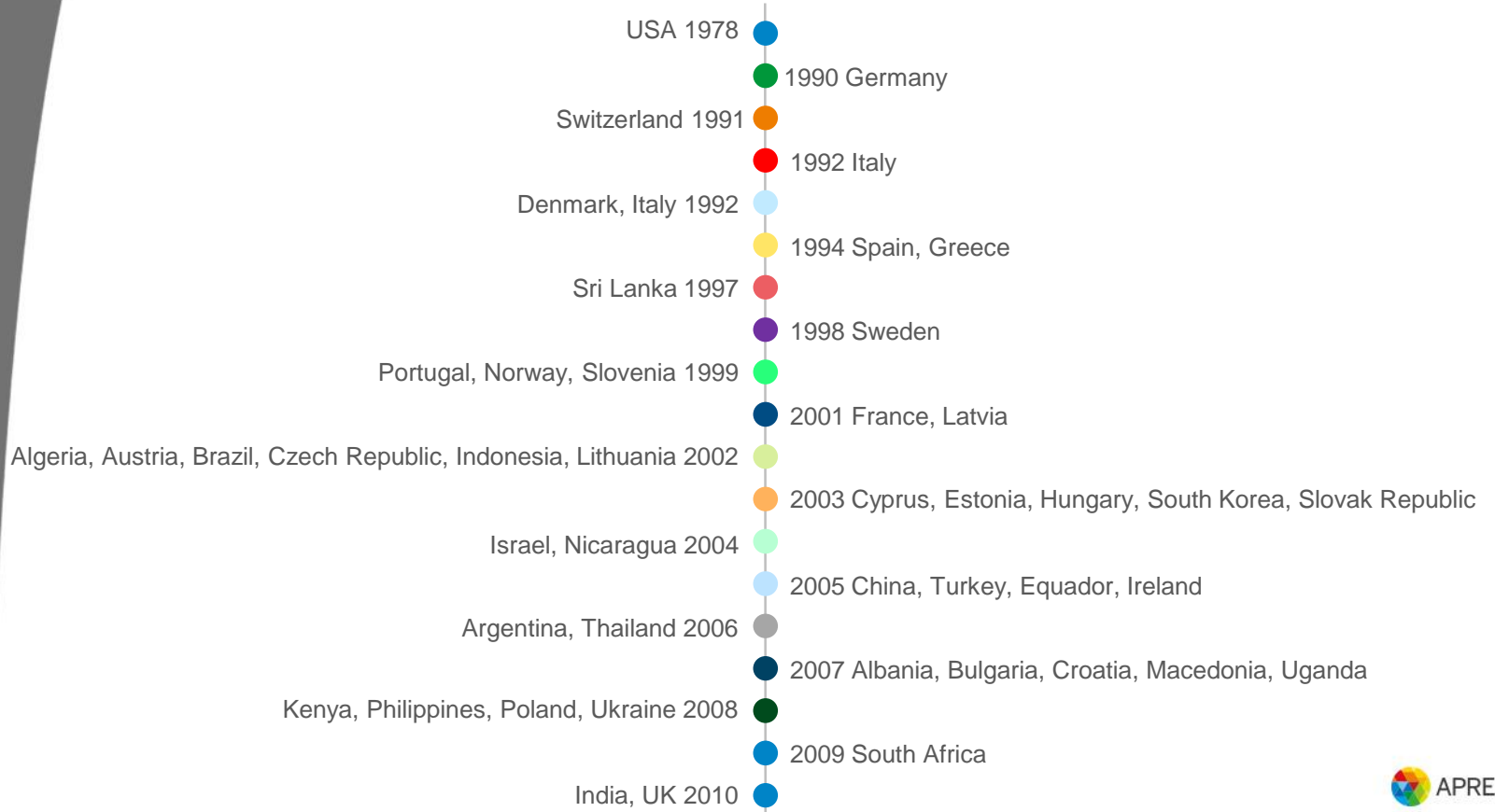
Designing a Solid Strategy

Vision



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DEBRIEFING FIT PROGRAMS





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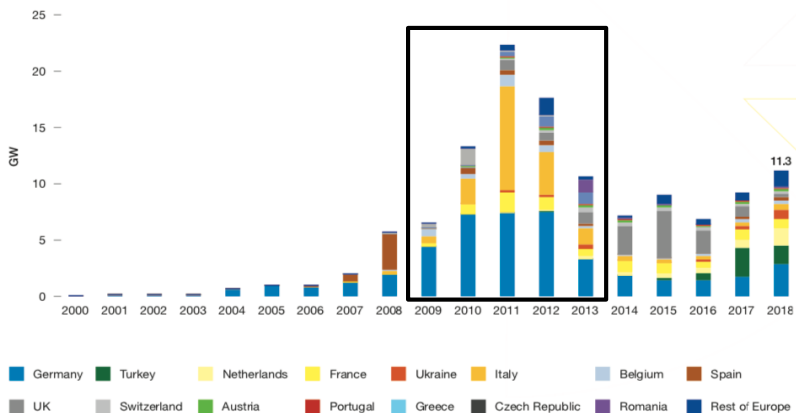
FROM FIT TOWARDS GRID PARITY

2012

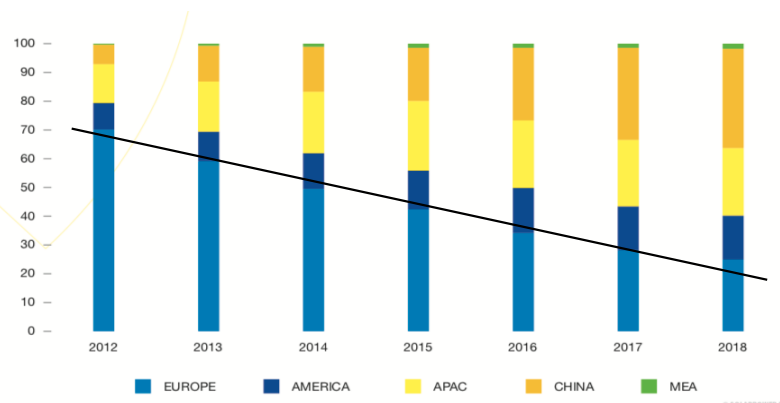


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European annual PV installed capacity 2000-2018



Global total solar PV installed capacity shares 2012-2018



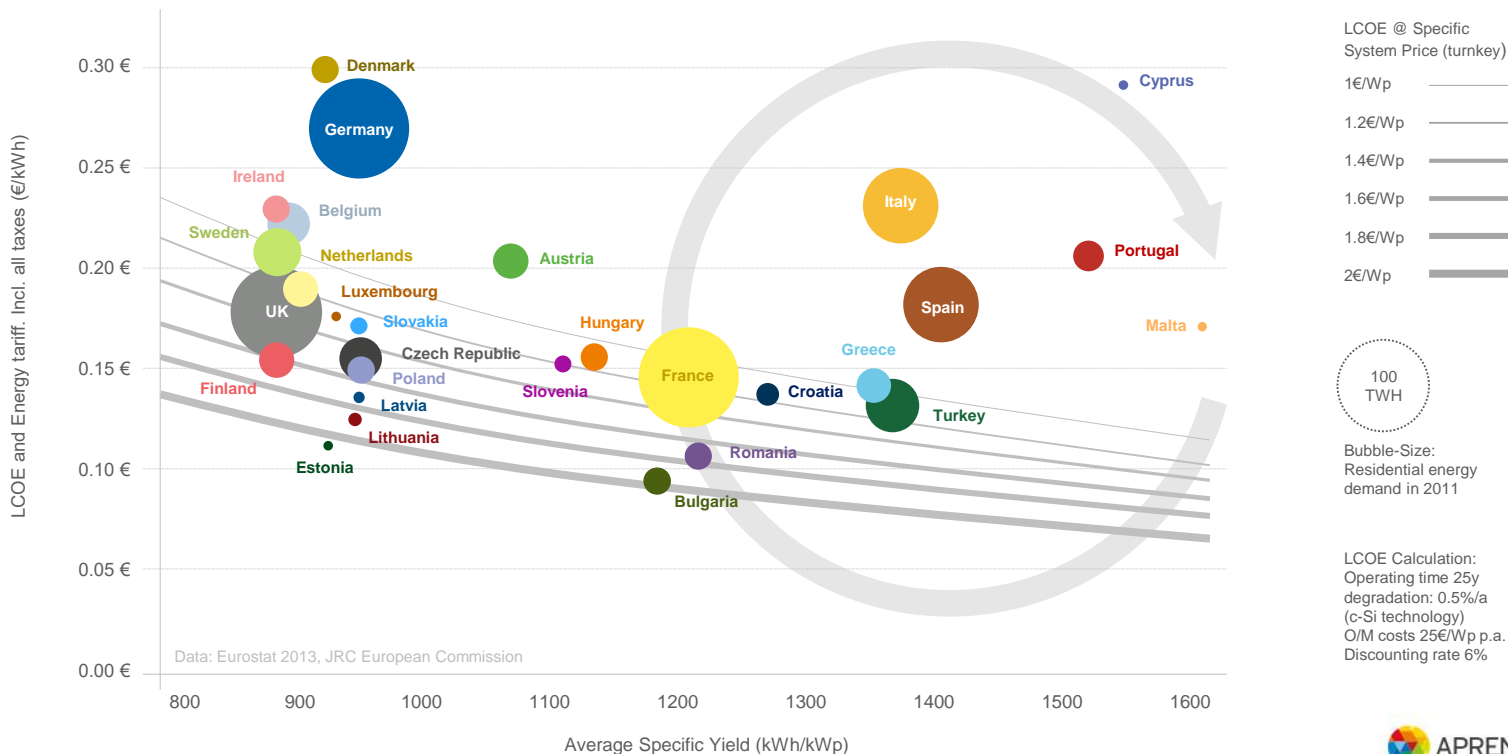


FROM FIT TOWARDS GRID PARITY

2012



Grid Parity Targets





GRID PARITY

... THEN WHAT?



2015

2016

- Countries with regions of grid parity
- Grid parity for regions with high electricity price



Source: Deutsche Bank Estimates

~~Private PPA's~~ (25€/Mwh)

~~Financing Spot~~

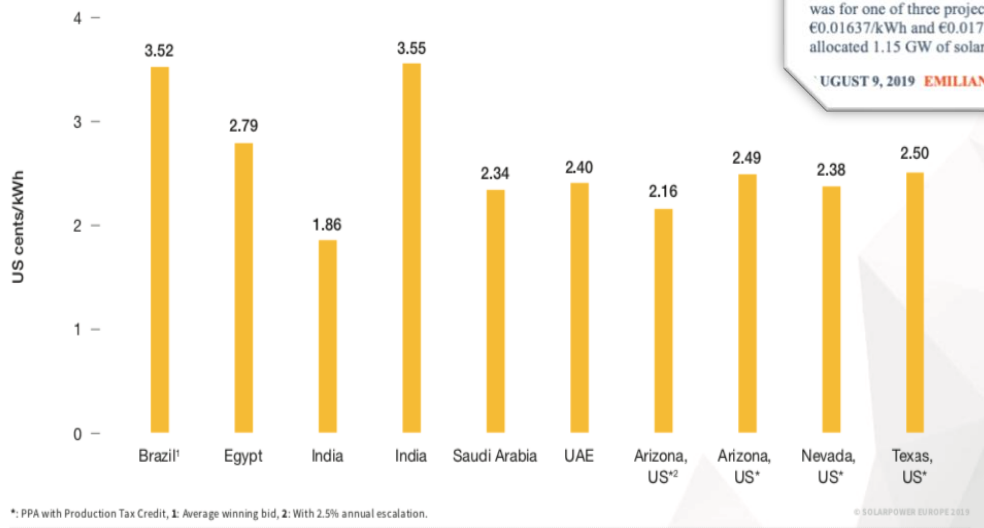
~~Energy spot price~~

NEW POLICY TREND

2016 – 2019

Reverse Auctions Policy – Back to fixed return

Lowest solar auction bids around the world in 2018



Winners, projects, prices of Portugal's record PV auction

The Portuguese government has published the final results and a list of all projects selected in the procurement exercise. French IPP Akuo is the developer behind the record bid of €0.0147/kWh, which was for one of three projects it won in the auction. The second- and third-lowest winning bids were €0.01637/kWh and €0.0171/kWh, while the highest was €0.03116/kWh. Overall, the authorities allocated 1.15 GW of solar in the oversubscribed auction, down from initial plans for around 1.4 GW.

AUGUST 9, 2019 **EMILIANO BELLINI**

Grid parity didn't stay for so long... Solar is now pricing driver!!

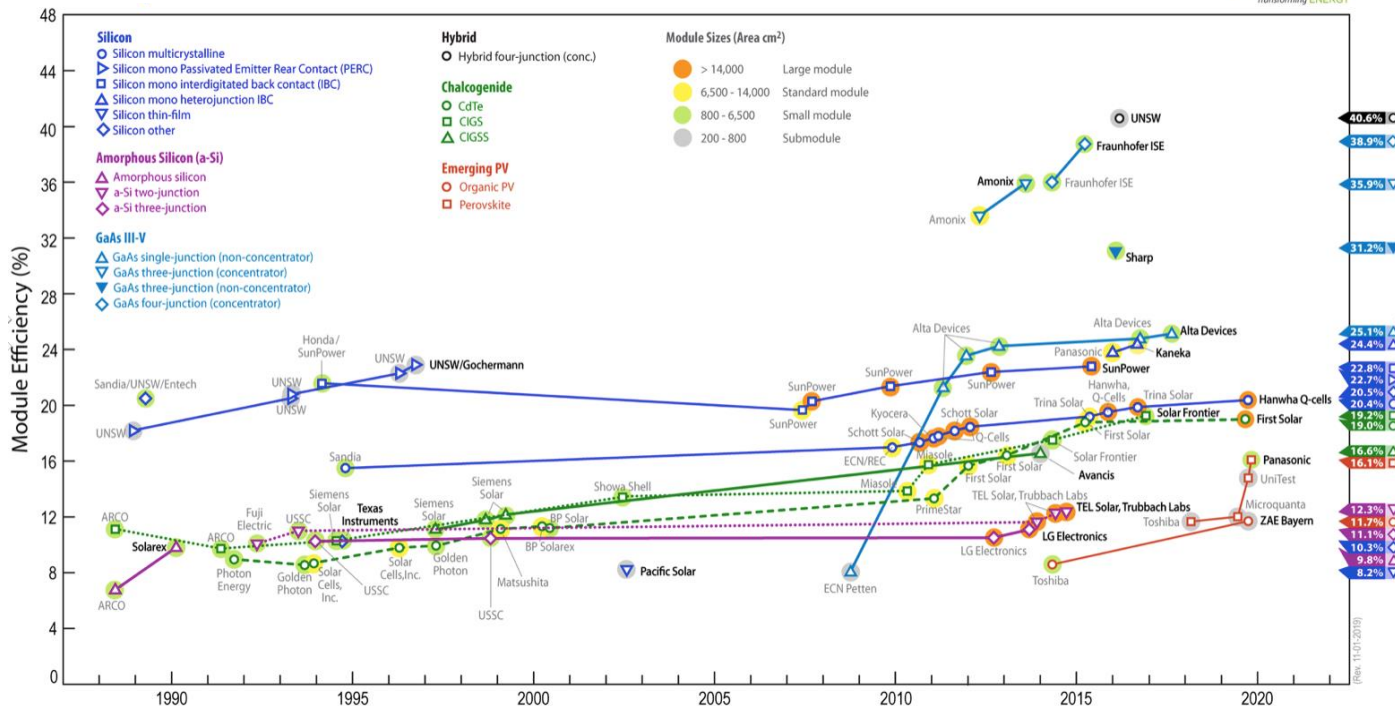


PREDICTING THE FUTURE IN PORTUGAL



Technological evolution

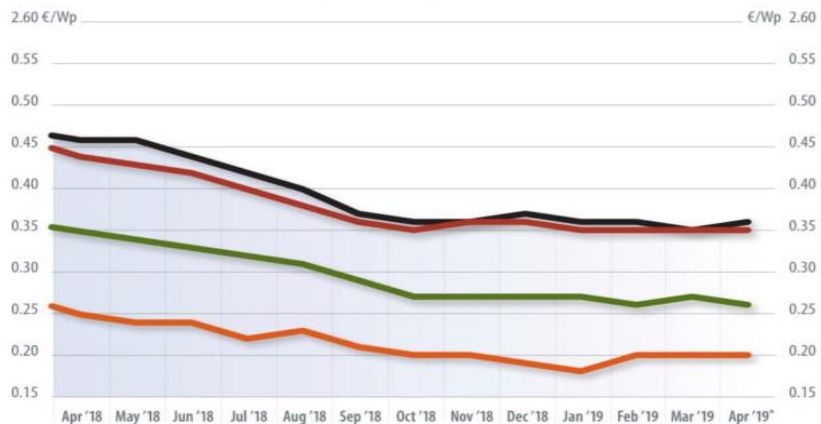
Modules efficiency 2019



PREDICTING THE FUTURE IN PORTUGAL

Technological evolution

EU spot Market modules prices by technology



Crystalline modules (mono-/poly-Si) average net prices (€/Wp)

- **High efficiency:** Crystalline modules 290 Wp and above with Cello, PERC, HIT-, n-type – or back-contact cells or combinations thereof
- **Mainstream:** Modules with usually 60 cells, standard aluminum frames, white backing and 260 Wp to 285 Wp – the majority of modules on the market
- **All black:** Module types with black backsheets, black frames and rated outputs of between 200 Wp and 320 Wp
- **Low cost:** Reduced-capacity modules, factory seconds, insolvency goods, used modules (crystalline), products with limited or no guarantee

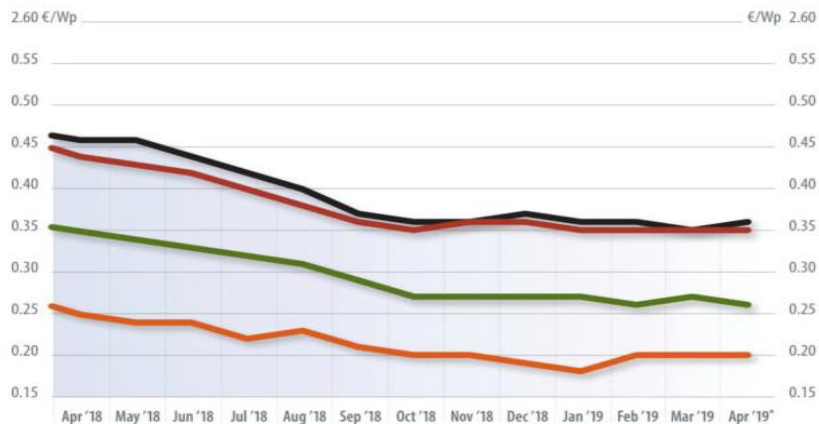
* Data up to April 11, 2019

More information: www.pvXchange.com

PREDICTING THE FUTURE IN PORTUGAL

Spot price evolution

EU spot Market modules prices by technology



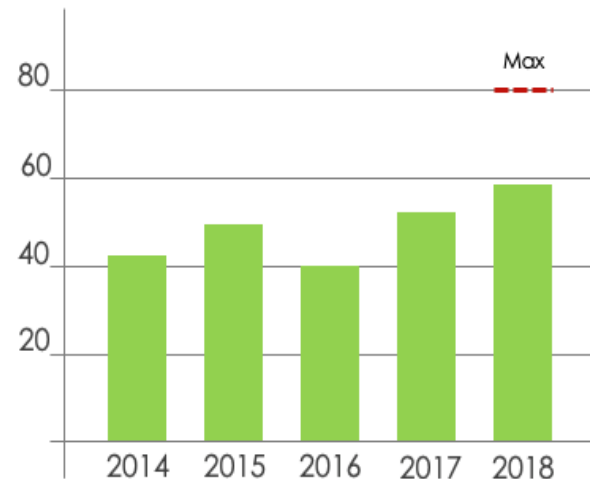
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Average energy prices/MW MIBEL



PORTUGUESE MARKET EVOLUTION

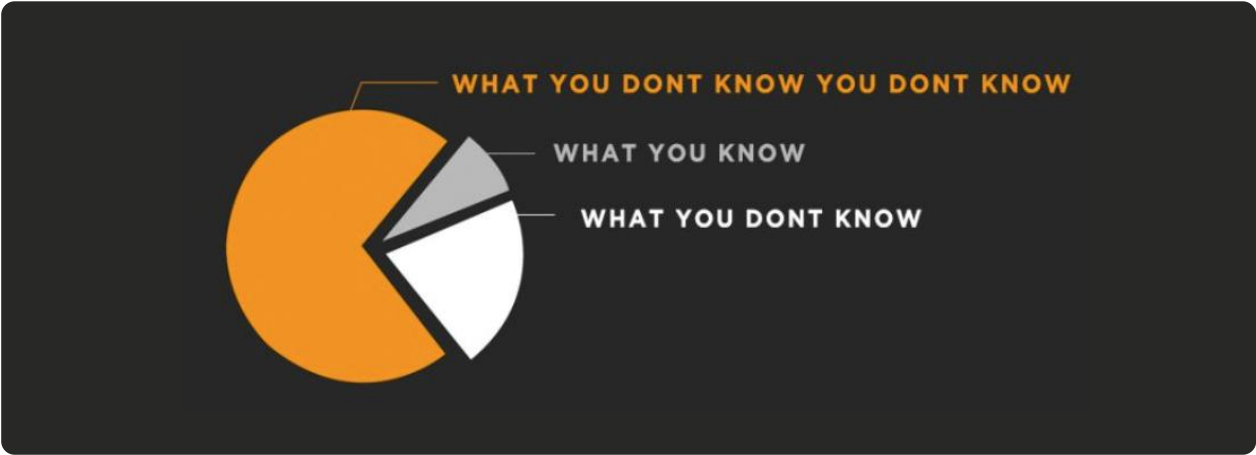
Today & Possibilities

- ✓ *Private PPA's (40-50€/Mwh)*
- ✓ *Financing Spot*
- ✓ *Energy spot price*
- ✓ *Modules Technology*
- *Inverters / grid stability*
- *Batteries / grid stability*
- *Floating*
- *Hydrogen*



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DESIGNING A SOLID STRATEGY



COUNTRY RATING CAPEX TAXATION OPEX

FINANCING DEVELOPMENT COSTS GRID TIME

LAW **INVESTORS** ENERGY PRICE **PPA**

AUCTIONS DEVELOPMENT PROCESS TECHNOLOGY



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✓ *Long-term plan*

✓ *Adaptive options*

✓ *Mitigate risk*

✓ *Multi-Country*

✓ *Multi-Technology*

✓ *Experienced Team*

✓ *Investment*

✓ *Partners Selection*



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Direct customers



Project Development



Asset Management



Venture Capital



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SMARTENERGY IN EUROPE

European activity & Structure



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Committed to sustainable energy generation.



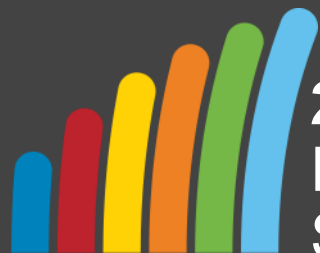
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