Renewable Electricity:

Reducing costs and carbon emissions in partnership with a power producer

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CW Group

Speakers & Agenda

voltalia

SOLAR • WIND • HYDRO • BIOMASS • STORAGE

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- About Voltalia
- Why are industrials procuring renewables?
- What can a power producer offer to industrials ?

- About Bird & Bird
- A regulatory perspective

About Voltalia

RA Solar, 32 MW

Business Areas & Technologies

Power Producer (IPP)

- **Ownership** of power plants
- Generation & sale of electricity
- **Public and private** PPAs

Service Provider

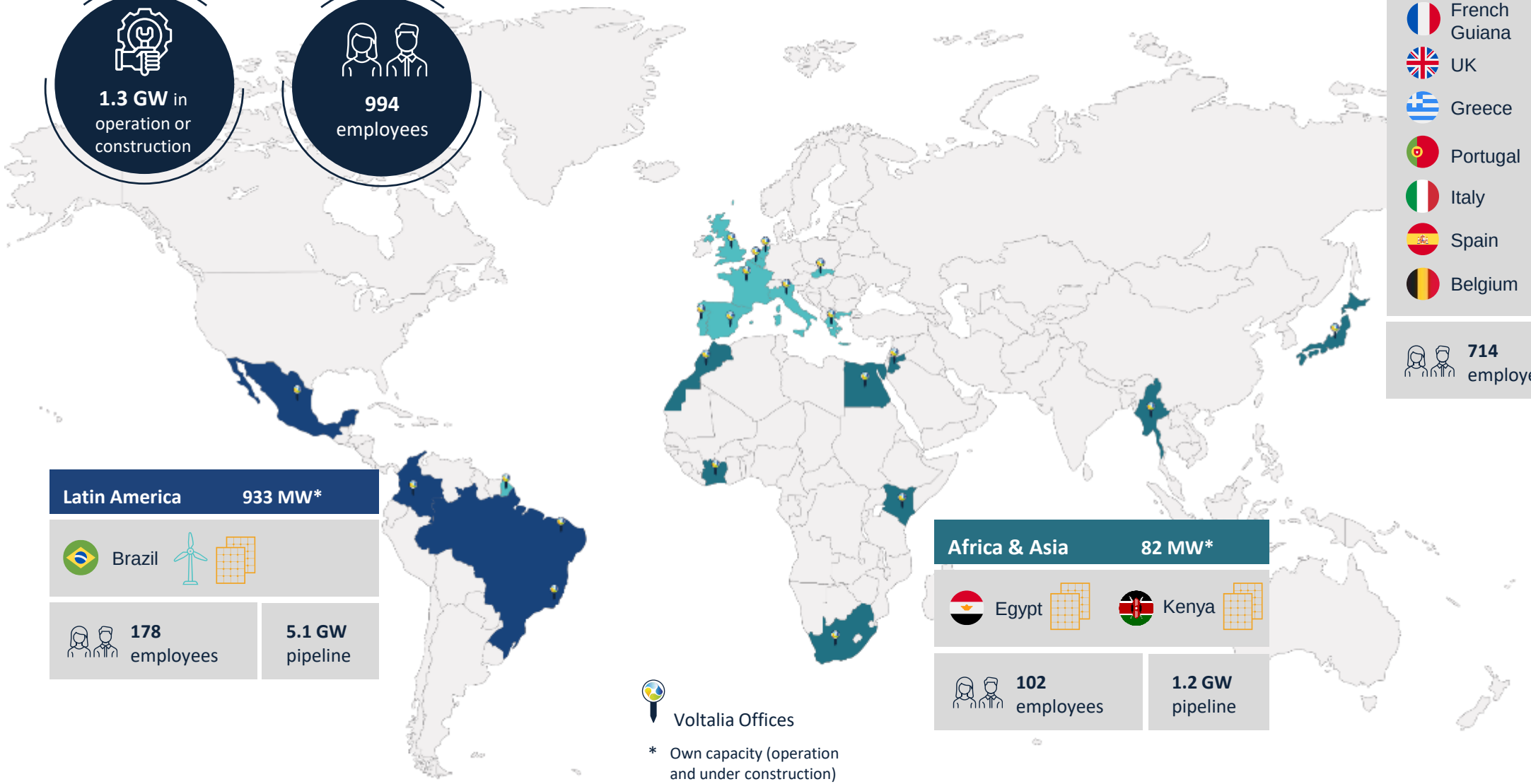
- For **own & third-party assets**
- Development | EPC | O&M

SOLAR WIND HYDRO BIOMASS STORAGE

Key Figures by Region

1.3 GW in operation or construction

994 employees



Europe — 280 MW*

- France
- French Guiana
- UK
- Greece
- Portugal
- Italy
- Spain
- Belgium

714 employees

2.2 GW pipeline

Latin America — 933 MW*

- Brazil

178 employees

5.1 GW pipeline

Africa & Asia — 82 MW*

- Egypt
- Kenya

102 employees

1.2 GW pipeline

Voltalia Offices

* Own capacity (operation and under construction)

Working with corporates

Flexible **Configurations**

- On-site / private-wire / behind-the-meter projects
- Off-site / wheeled projects

Flexible **Technology Mix**

- Single or multiple technology
- Hybrid plants (including storage/thermal)

Flexible **Contractual Arrangements**

- “Physical” or “Virtual” PPAs
- Best fit according to regulatory framework

600 MW

signed in
2019 & 2020

20 years

PPA average duration

References

Telefónica

Auchan

DECATHLON

boulanger

LCL BANQUE ET ASSURANCE

Crédit Mutuel

SNCF

DOMINE DIRIGE NOS
CITY OF LONDON

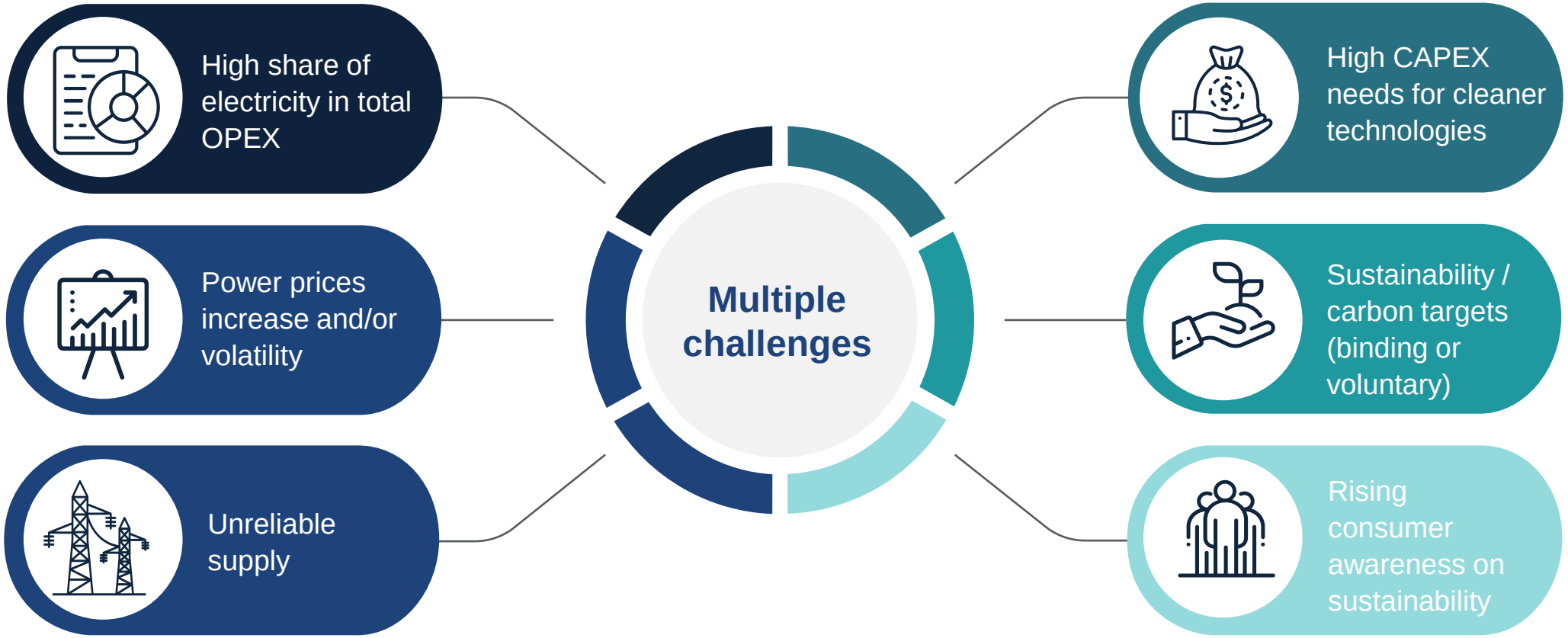
brf

Braskem

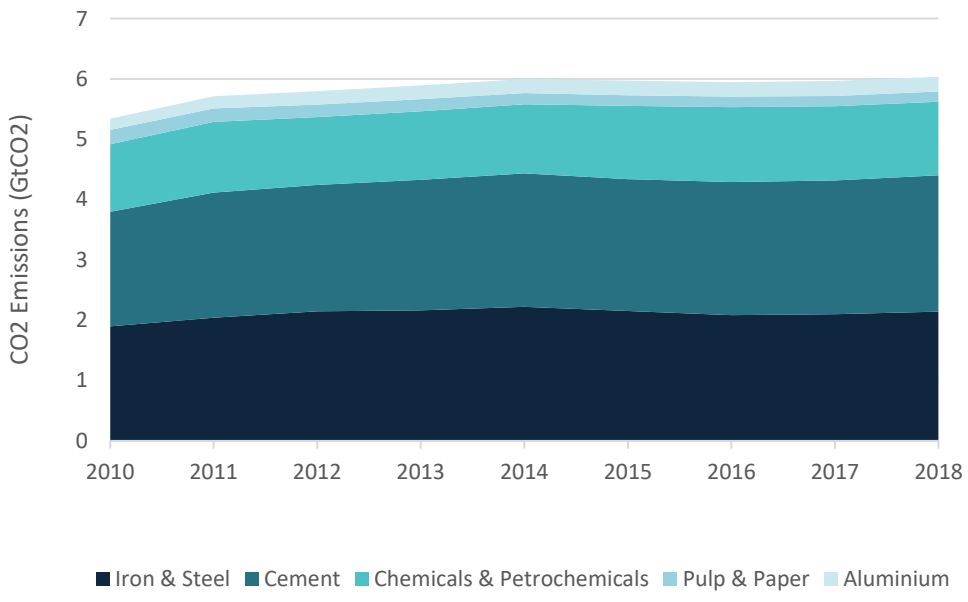
Why are industrials procuring renewables ?

RA Solar, 32 MW

Power & Heavy Industries : an overview

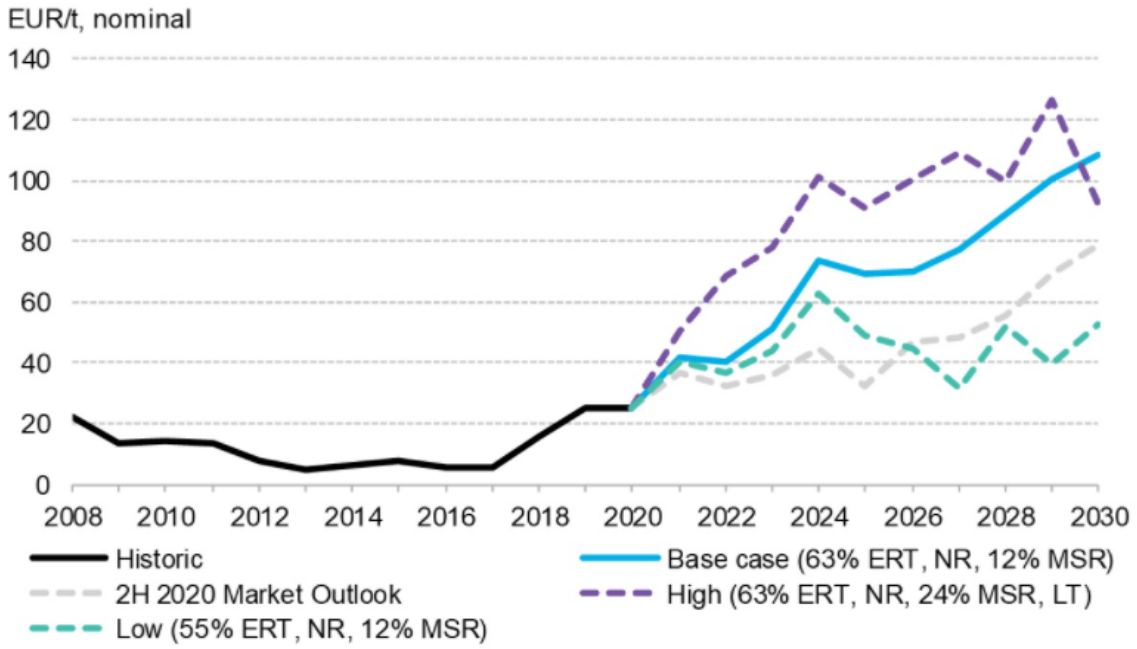


Carbon Emissions and Prices



Global CO2 emissions (2010-2018) for key industries

Medium- and long-term EUA price projections, annual averages



Source: BloombergNEF

Note: Assumes an EU ETS reduction target of 63% by 2030. ERT = Emissions reduction target. NR = no one-time rebasing of the cap. MSR = Market Stability Reserve. LT = injection threshold lowered to 600Mt from the current 833Mt.

EUA = Carbon **Emission** Allowances

Carbon Targets : Cement Sector

HEIDELBERGCEMENT

15% CO2 reduction by 2030 compared to 2019

Carbon neutral by 2050

.

LafargeHolcim

40% CO2 reduction by 2030 compared to 1990

ARGOS

29% CO2 reduction by 2030

Carbon neutral by 2050

CEMEX

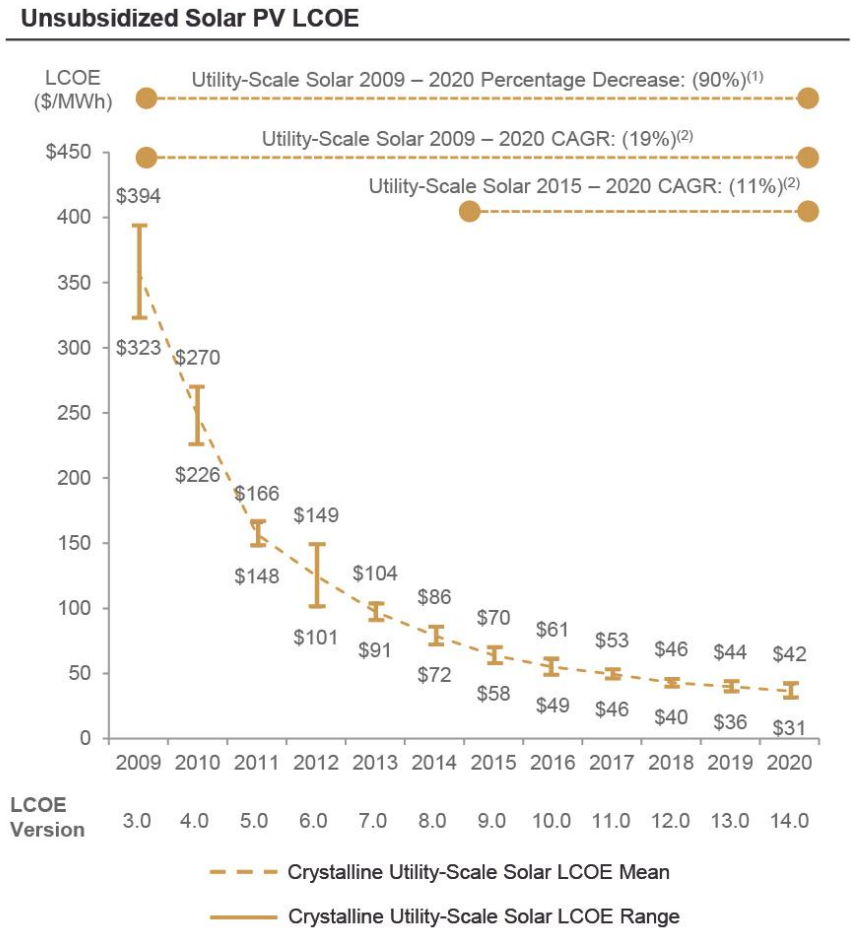
35% CO2 reduction by 2030 compared to 1990

(55% in Europe)

Votorantim Cimentos

Carbon neutral by 2050

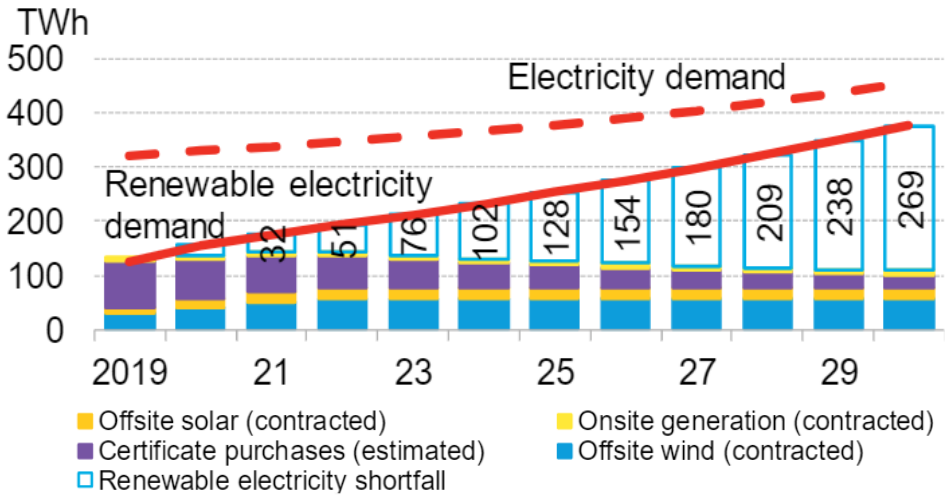
Declining Costs of Renewables



- **Utility-scale PV LCOE** (low end) is **$31/MWh** as of 2020, against $26/MWh for utility-scale wind and $28/MWh for combined cycle gas generation (Lazard, Oct 2020)
- Cost declines in **Battery Energy Storage Systems (BESS)**, notably for lithium-ion technologies. PV + BESS projects have an LCOE estimated between $250-300/MWh for industrial facilities, against $80-140/MWh for grid-connected (Lazard, Oct 2020).
- **Green hydrogen** is next step to increase the commercial viability of renewables

Renewable Energy Procurement Trends

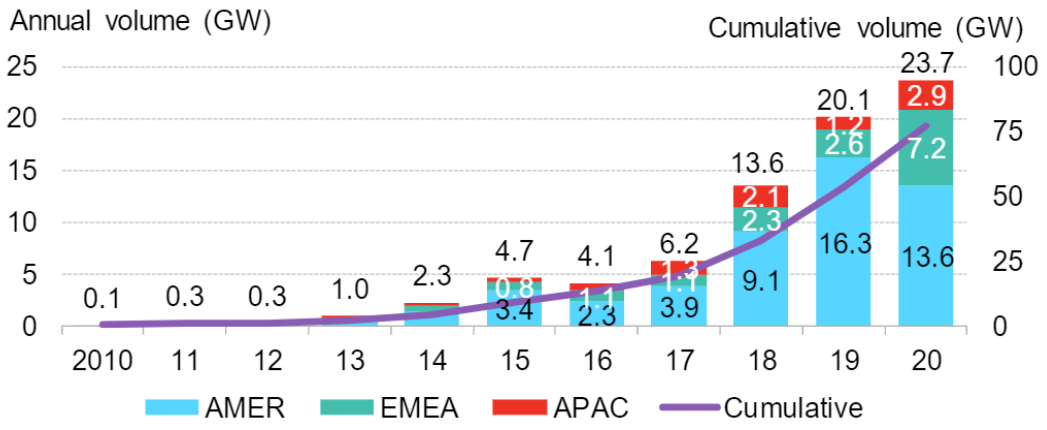
Renewable Electricity Demand from RE100 companies, based on current members and demand forecasts to 2030 (BNEF, 2021)



- A growing number of industrial companies are **committing to renewable energy** (RE) / carbon reduction targets
- **Growing participation of heavy industries**
- Very dynamic market in North America / Europe, growing in LATAM / Asia, starting in Middle-East / Africa
- Some companies already cover 100% of their needs with clean electricity in “mature” markets
- **RE certificates purchase** (separate from power) is a declining strategy, as opposed to new projects (additionality)

PPAs : the Preferred Option for Industrials

Annual and Cumulative PPA capacity signed, by region (BNEF, 2021)



Source: BloombergNEF Note: Onsite PPAs excluded. APAC volume is an estimate. Pre-reform PPAs in Mexico and sleeved PPAs in Australia are excluded.

- Power Purchase Agreements (PPAs) have become the **preferred source of corporate RE procurement**
- Best solution for additionality and long-term price securing
- Record-high capacity of PPAs signed every year : 13 GW in 2018, 20 GW in 2019 and **24 GW in 2020**
- **PPAs are mostly procured from an Independent Power Producers (IPP)** who develop, own and operate the projects

What can a power producer offer to industrials ?

RA Solar, 32 MW

Why procuring RE with an IPP ?

Price Security & no CAPEX

A stable & competitive electricity tariff on the long-term without any upfront CAPEX investment

► **Protect from price volatility and maintain cash position**

Sustainability

Addition of a new RE project and ownership of its environmental attributes (certificates)

► **Achieve CO2 emission reduction targets**

Reliability

On-site generation provides diversification of supply risk, mostly where the grid is absent or unreliable

► **Improve security of supply**

Customization

A bespoke solution developed according to the facility's need with adequate risk sharing

► **Save time and resources**

Two configurations for power plants

On-site / Captive / Behind-the-meter

Power plant located in the premises of the industrial facility, directly on surrounding land

IPPs can offer **a mix of both configurations** according to the features of the industrial facility and the market environment/regulations

Off-site / In-front-of-the-meter

Power plant(s) are not in the same area as the industrial facility, electricity is transmitted by the grid

On-site configuration

Suitable for:

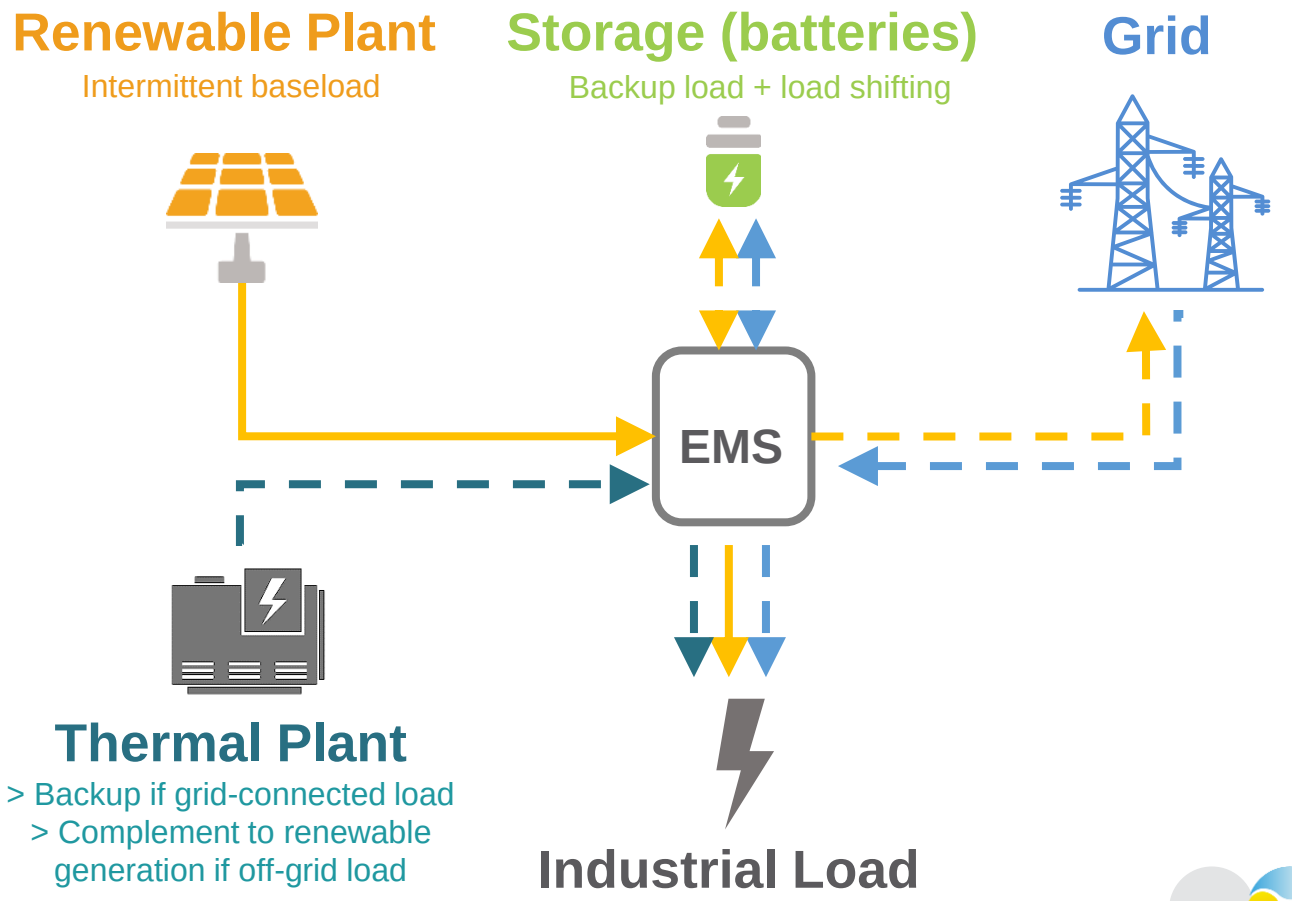
- **Grid-connected** facilities
- Facilities that **do not have access at all or to a reliable grid**

Main constraints:

- Land access and quality
- Energy resource

Potential upsides :

- Renewable asset can be **combined with storage/thermal power** (« hybrid solution ») to guarantee a **continuous power supply**



Off-site configuration

Suitable for:

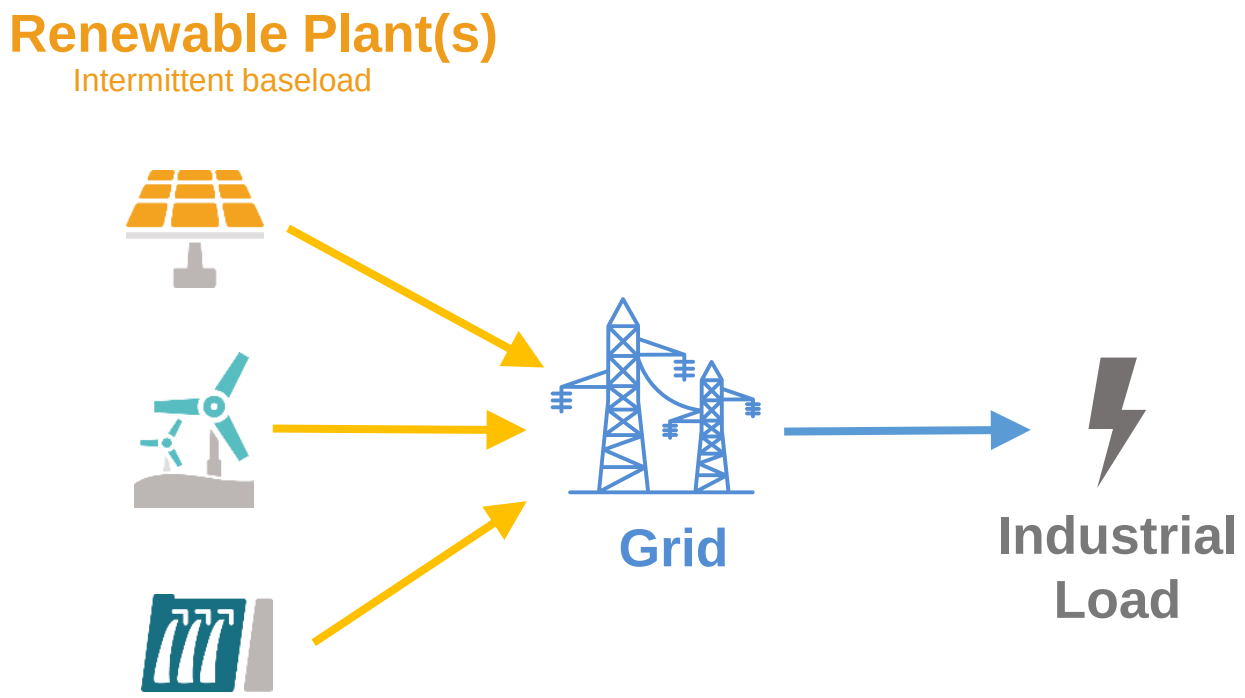
- Industrial facilities that have **access to a reliable grid**
- Preferable option if **no access to land and energy resource**

Main constraints:

- **Wheeling + balancing** issues
- Regulation

Potential upsides :

- In some cases, possibility to **sell the surplus** to the grid



Commercial Design

- ✓ IPP **develops, finances, builds, owns and operates** the generation asset
- ✓ In on-site configurations, IPP can include already-existing assets to the project/operation
- ✓ There are several contractual arrangements according to the market environment and regulation, as well as clients' preferences, for example :

	IPP model	Leasing model
Service provided by the IPP	Electricity supply from the generation asset	Use of the generation asset
Contractual Arrangement	Power Purchase Agreement (PPA)	System Rental / Leasing

Renewables PPAs (or equivalent) in Cement

Poland	Jordan	Honduras	Namibia	Egypt
Offsite PV - 65 MW	*Offsite PV - 15 MW*	*Onsite PV - 10.6 MW*	*Onsite PV - 5 MW*	*Onsite PV - 7.5 MW*
10-year PPA	15-year ESCO		PPA	25-year BOOT
Completion exp. 2021	Completed 2019	Completed 2020	Completed 2018	Under construction

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Case Study : On-site PV plant

RA Solar, 32 MW

Modeling the simulation

Inputs from the industrial:

Monthly electricity consumption

Electricity bill

GPS coordinates

Available land area

Outputs from the simulation:

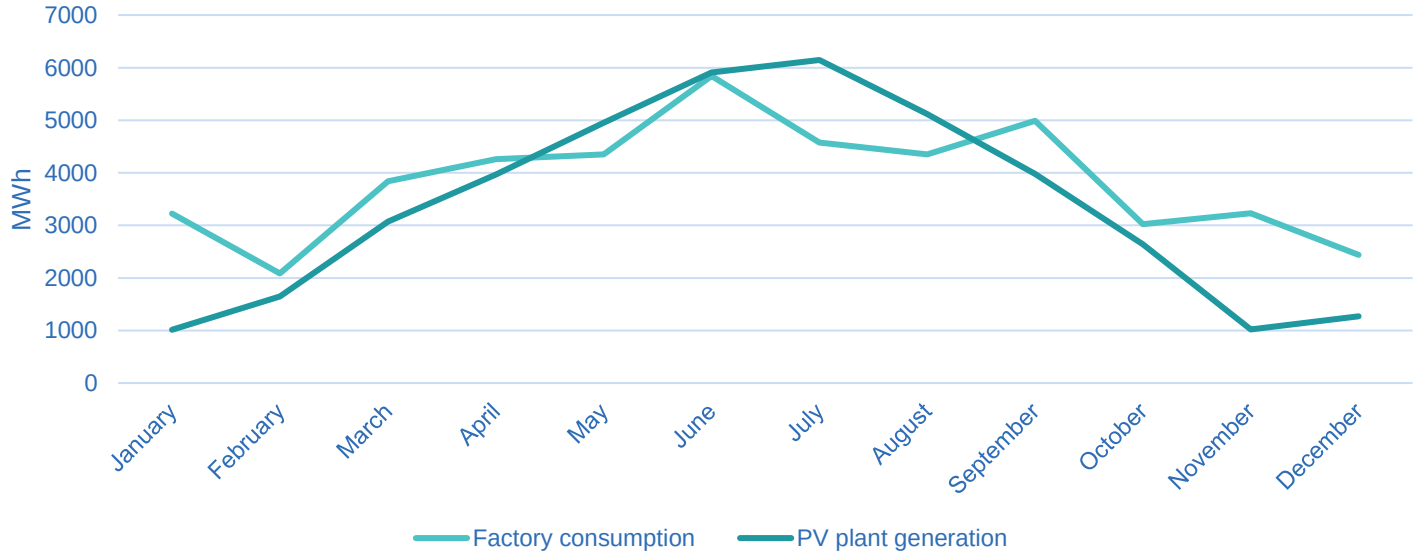
Peak power MWp

Produced electricity MWh

Needed land area ha

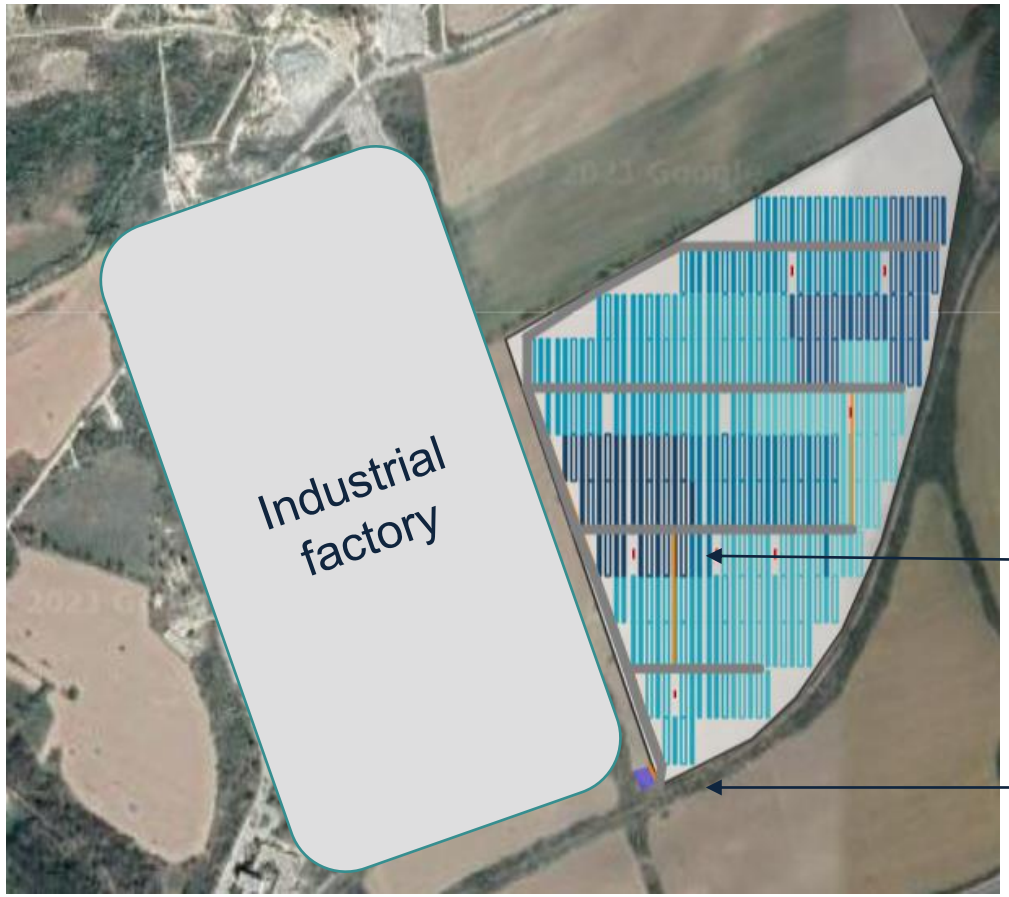
PPA price €/MWh

Cost savings €/$



A perfect match between the electricity factory consumption and the PV generation

Modeling the Solution



- ✓ Net savings on the yearly bill: **from 2% to 7 %**
- ✓ Optimization about the surplus of electricity:
  - Selling on the grid
  - Factory consumption adjustment
- ✓ Fast return on investment
- ✓ Increase of the RES share in the total electricity consumption of the factory

On-site PV generation can cover 100% of your daily electricity consumption

A regulatory perspective

Bird & Bird

Regulations impact on structure used

- Regulations prescribe that a private company cannot supply electricity to a third party and cannot own any generation assets (other than for self consumption)
- deferred consideration model
  - developer procures and finances build, transfers title to offtaker upon commissioning and maintains and operates facility until costs paid off through monthly charge.
  - not project finance as no asset security.
- Regulations prescribe that a private company can own generation assets but not supply electricity to third parties
  - equipment lease/services model
- Regulations prescribe that a private company can own generation assets and supply electricity to third parties
  - most typical model
  - project finance

All above options are bankable, with lowest option being most bankable.

Two models depending on grid connection

1. Private wire supplies to offtaker

Additional variants:

- wheel any surplus to another site of offtaker
- net metering arrangement

2. Supplies to offtaker via the grid through wheeling

Most desirable regulatory combination:

- Private companies can own generation facilities and supply electricity to third parties
- Wheeling and net metering regulations
- Ability to sell surpluses to grid company

Site surpluses

1. **Net metering**
   a. Any surplus which is exported is set off against any imports
   b. Common for such exports to be banked for up to 12 months
   Examples of net metering: Tunisia, Dubai, Jordan and Pakistan

2. **Wheeling**
   a. ability to transport any exports from one site to another via the grid network
   b. wheeling charge payable to grid operator, subject to line loss factor
   Examples of wheeling: Tunisia, Pakistan and Jordan

3. **Sale of exports to grid operator**

Require transparent regulations for the above, including proforma connection process and agreement

Q&A

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