Green Giraffe
The renewable energy financial advisors

# OFATE – Debt financing in the PV tenders context

27 November 2019

Nicolas Gourvitch

# Green Giraffe – We provide a wide set of services and skills

## Specialised financial services to renewable energy projects and investors

### Debt and M&A advisory

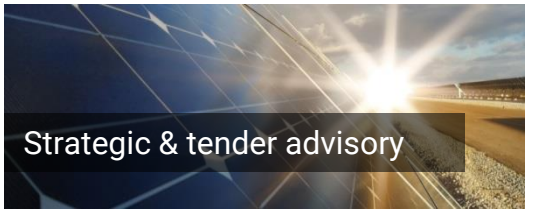
We design and execute the most suitable financing structure, or provide independent valuations, based on project characteristics and market conditions. We ensure contracts are bankable, project economics work, and the transaction successfully closes. We know most lenders & investors, and their preferences


### Development, contracting & PPAs

We help your project achieve critical milestones (permit, tariff) and support you during business plan development, and contract structuring and negotiation, including bankable PPAs, whether with utilities or corporate buyers


### Strategic & tenders advisory

We provide benchmarking services, reviews of regulatory frameworks, analysis of market developments, and offer full-fledged support to bidders for tenders. We know the latest market insights, terms and conditions on corporate and contractual structures, debt and equity deals, participants and commercial terms




### Modelling

We offer a full suite of standalone modelling services: review of existing models, implementation of sensitivities or design of new models from scratch

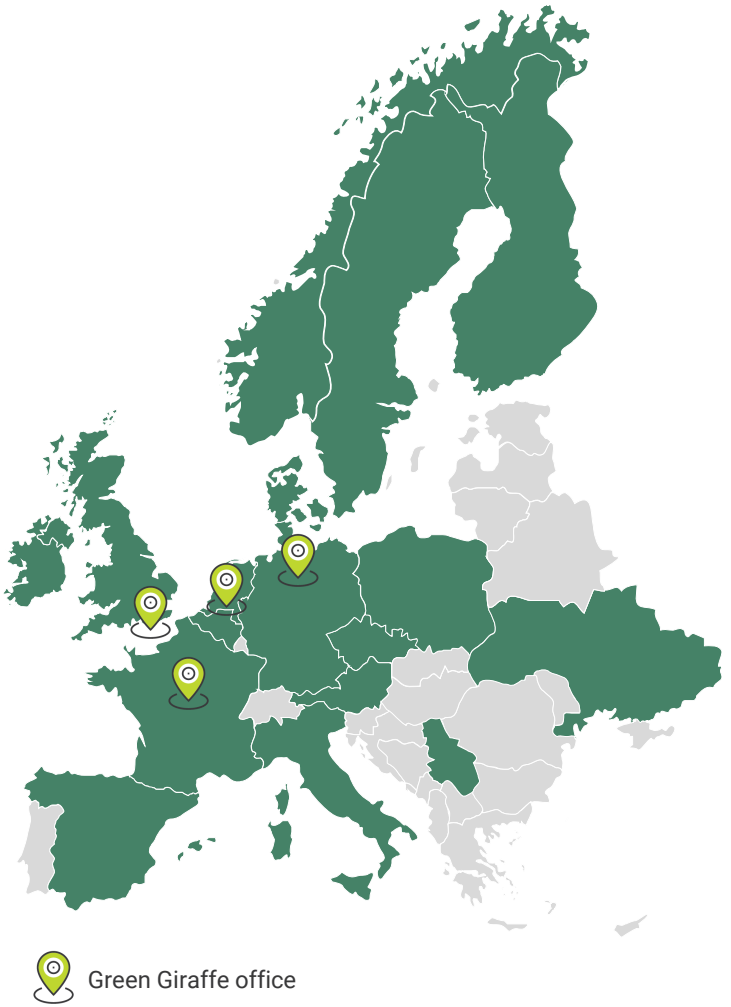
# Green Giraffe – The renewable energy finance specialist

## An unparalleled track record in successfully closing deals for our clients

**Active** in **46 countries,**
including 18 in Europe

Close to **EUR 25 billion** funding raised for renewable energy projects in **9 years**

Involved in over **150 renewable energy transactions or projects** with a total capacity of circa **35 GW**



# OFATE – Debt financing in the PV tenders context

## Table of contents



# 1. From FiT to CfD

## Solar – Existing support regimes for ground-mounted and parking solar installations

| Existing support regimes (ground-mounted and parking solar installations) | | | |
|---|---|---|---|
| Project capacity | < 100 kW | > 100 kW and < 500 kW | > 500 kW |
| Support regime | FiT on simple demand[1] | FiT with tender process | CfD with tender process |

**Since May 2016, new projects with a capacity above 500 kW have to go through a tender process to be awarded a CfD contract**

- The feed-in premium is then based on the strike price offered by the project during the tender
- 8 solar tenders are expected to be held from S1 2017 to S2 2020

**Projects are divided within 3 categories**

- Group 1: ground-based projects from 500 kW to 5 MW
- Group 2: ground-based projects from 5 MW to 30 MW [2]
- Group 3: parking shade houses from 500 kW to 10 MW

**Results of the last tender (#6) were announced on 5 August 2019**

- 4 developers were awarded more than 50% of the attributed capacity
- A total 857 MW capacity was awarded
- Average price is 59.5 EUR/MWh for facilities above 5 MW (vs. 56.8 EUR/MWh in the previous tender) [3]

*[1] On simple demand = without a tender process [2] Before Q2 2018, group 2 included ground-based projects until 17 MW only [3] https://www.ecologique-solidaire.gouv.fr/solaire#e4*

# 1. From FiT to CfD

## Solar – Existing support regimes for roof-mounted solar installations

| Existing support regimes (roof-mounted solar installations) | | |
|---|---|---|
| Project capacity | > 100 kW and < 500 kW | > 500 kW and < 8 MW |
| Support regime | FiT with tender process | CfD with tender process |

**Since September 2016, new projects with a capacity above 100 kW have to go through a tender process**

- The CfD feed-in premium is then based on the strike price offered by the project during the tender
- 10 solar tenders are expected to be held from S1 2017 to S2 2020

**Projects are divided within 2 categories**

- Group 1: roof-mounted projects from 100 kW to 500 kW
- Group 2: roof-mounted projects from 500 kW to 8 MW

**Results of the last tender (#8) were announced on 8 October 2019**

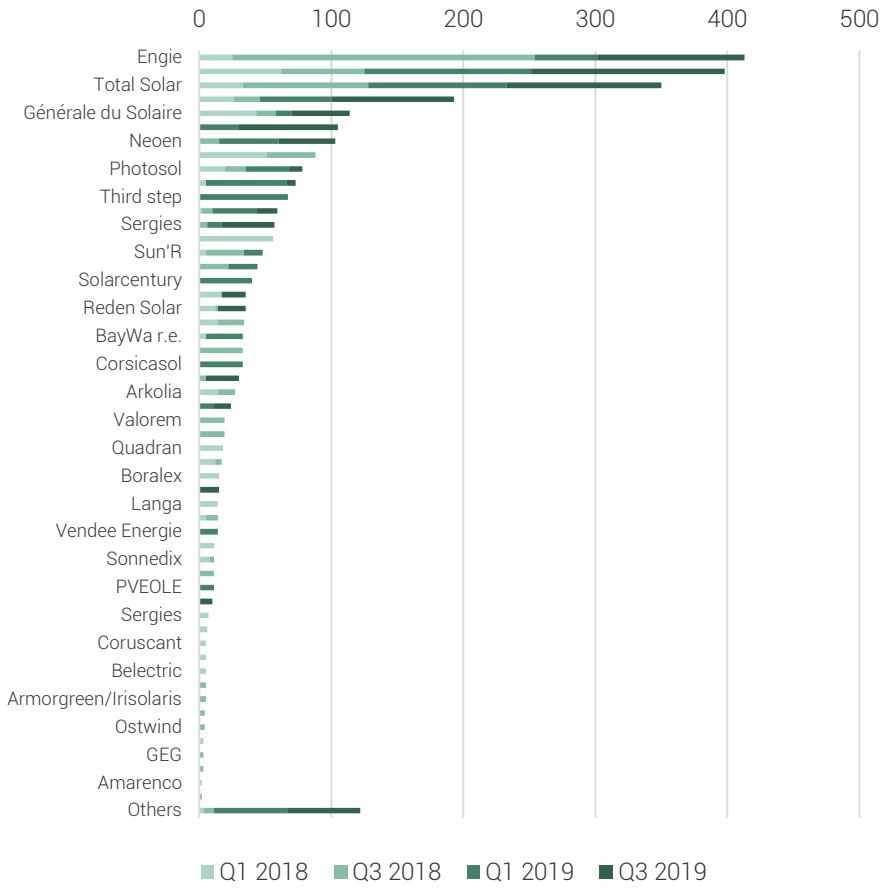
- 5 developers were awarded more than 50% of the attributed capacity
- A total 127 MW capacity was awarded
- Average price is 86.5 EUR/MWh for facilities above 8 MW (vs. 93.0 EUR/MWh in the previous tender) [1]

[1] *https://www.ecologique-solidaire.gouv.fr/solaire#e4*

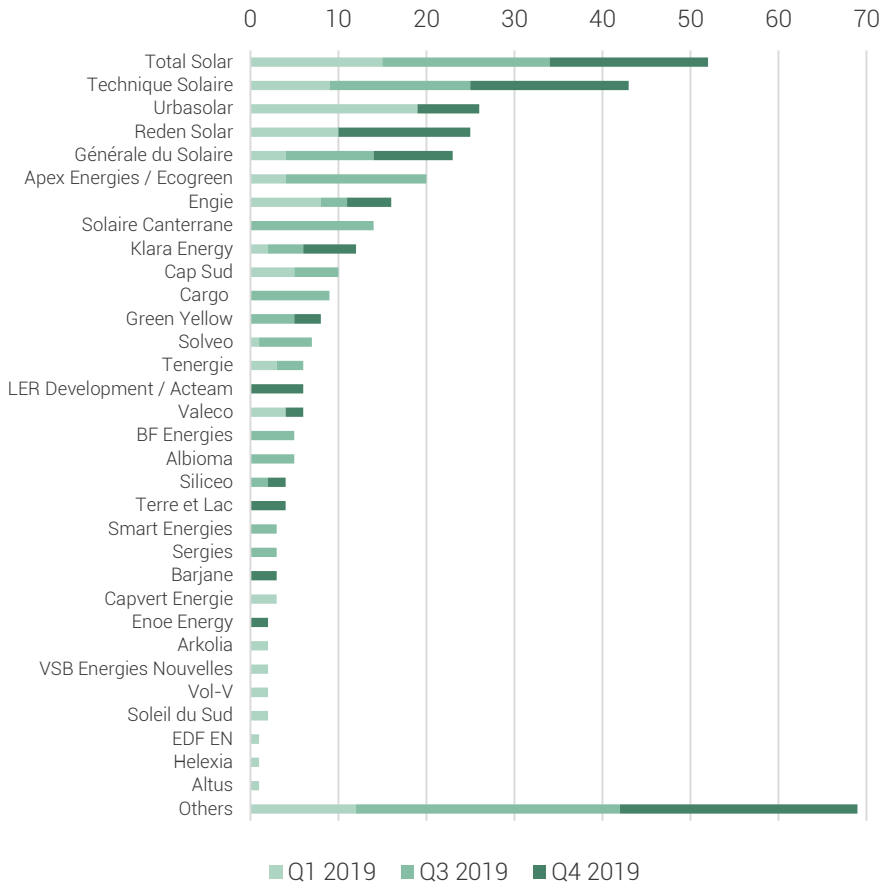
# 1. From FiT to CfD

## Developers and IPPs still dominate French solar tenders

Recent French solar tender results for ground-mounted and parking installations (MW)



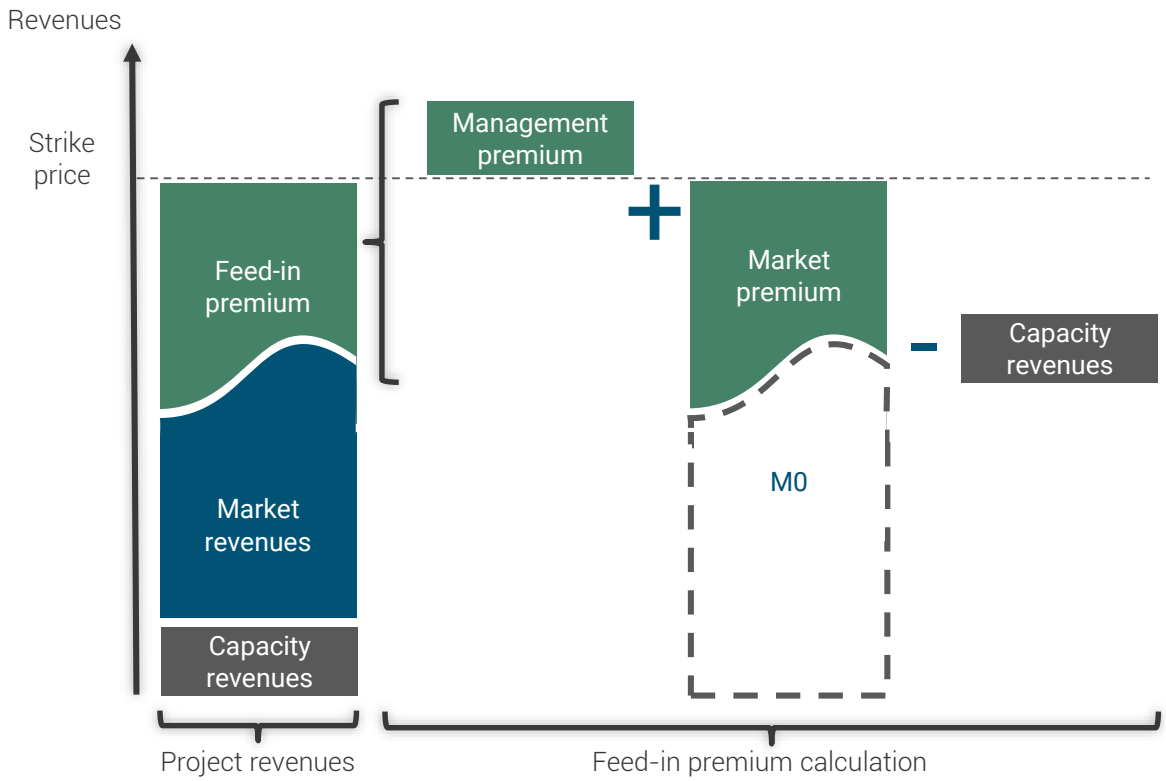

Recent French solar tender results for roof-mounted installations (MW)



# 2. CfD mechanism in France

## Revenues streams in a CfD system

$$\text{Feed-in premium} = \underbrace{\sum_{i=1}^{n} E_i \cdot \rho_{man}}_{\text{Management premium +}} + \underbrace{\sum_{i=1}^{n} E_i \cdot (Te - MOi)}_{\text{Market premium -}} - \underbrace{(Nb_{capa} \cdot \rho_{ref\ capa})}_{\text{Capacity revenues}}$$




### CfD system

- The operator receives a feed-in premium from EDF, calculated ex-post, which tops-up the direct sale of electricity on the wholesale market or to an aggregator

### The feed-in premium is the sum of

- The market premium, which is the difference between the strike price and the M0 (the monthly average of market prices in the sector)
- The management premium, which covers the costs to introduce the electricity on the market
- Less capacity revenues, which are received independently (pre-existing system) and remunerate the ability to generate electricity during peak-demand periods

# 2. CfD mechanism in France

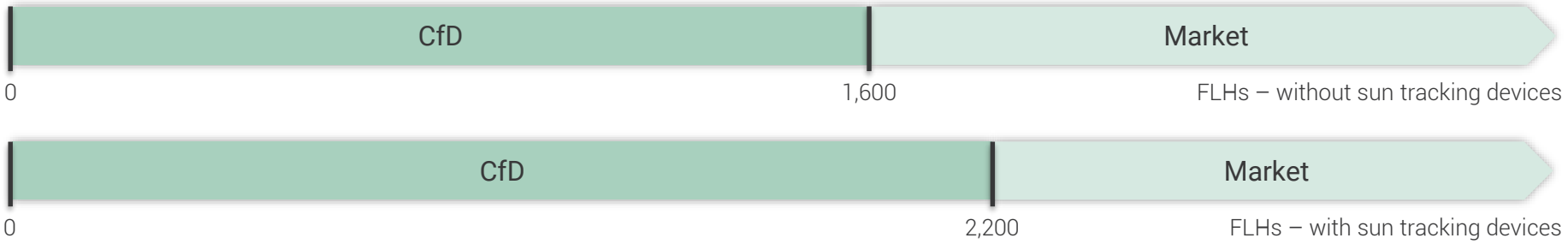
## Solar – CfD with tender process

The feed-in premium calculation is simplified in the case of a tender process as offered strike prices directly include management and capacity premiums. As a result, feed-in premium is equal to the difference between strike price and reference market price

Yearly productions taken into account for the calculation of the feed-in premium are capped at the following load factors

- 1,600 full load hours ("FLHs") for projects without sun tracking devices
- 2,200 FLHs for projects with sun tracking devices
- The electricity generated above that cap is sold directly on the market at market prices

A 3 EUR/MWh premium above the strike price is paid if at least 40% of the project is financed through crowdfunding



# OFATE – Debt financing in the PV tenders context

## Table of contents



# 3. Bankability challenges

## Balancing and M0 mismatch

**The feed-in-premium paid to the project is based on the M0 which may deviates from the project monthly average price**

- Each wind or solar farm has its own M which deviates from the national M0 depending on the production profile of the project. Some projects may outperform the M0 while others may have a lower M
- Projects generally choose to sell their production to an aggregator which commits to purchase the production at the M0 price
- Therefore, the risk of deviation to the M0 is transferred to the aggregator. This risk is taken into account in the **risk premium** paid to the aggregator

**As aggregation contracts duration usually lasts from 3 to 5 years, the long term prevision of this risk premium is uncertain**

- In 5 years, the aggregators may choose to increase the risk premium depending on the project variation to the M0 or on new market conditions

**A potential solution would consist in a gradual increase in the risk premium over the project lifetime**

# 3. Bankability challenges

## Counterparty risk

Under the CfD, the project will have two counterparties: the state-owned utility EDF for the CfD and the aggregator for the market revenues

- The aggregator counterparty risk has to be considered
- Banks will request a creditworthy counterparty or parent company (typically European utilities)

Potential solution: the aggregator will provide a first demand guarantee

- A guarantee covering 3 months of revenues is market standard
- 3 months is the expected time required to terminate the contract with the defaulting aggregator and to enter into a new contract with another aggregator

A last resort buyer mechanism is offered but banks discard it in their risk analysis

# 3. Bankability challenges

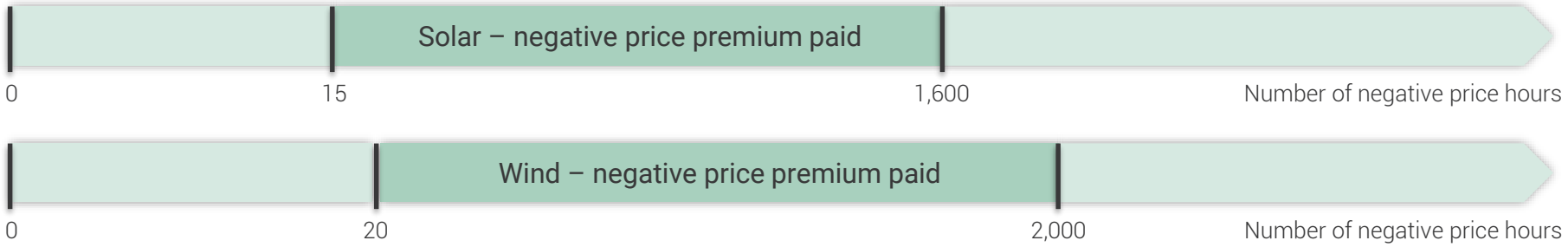
## Negative market price risk (1/2)

**When electricity prices are negative, projects are not paid a feed-in premium**

- The incentive not to produce is very strong as this is applied from the 1st hour of negative price
- This directly penalises the power producer but aims to rebalance the market rapidly
- As a comparison, projects in Germany do not receive CfD from the 6th consecutive hour of negative price

**Project may receive a negative price premium if they stop producing during these periods**

- This compensation is paid from the (i) 15th and (ii) 20th hour of negative price in a civil year for (i) solar and (ii) onshore wind projects respectively
- However, the number of indemnified hours is capped so that highly producing projects do not get any compensation
- This cap is set as 1,600 FLHs per year for solar projects and 2,000 FLHs for onshore wind projects




## Negative price compensation is conditioned to a production cap that most project will exceed

# 3. Bankability challenges

## Negative market price risk (2/2)

**The negative price risk fully remain within the project**

- An hour of negative price directly entails a loss in revenue if the project stops producing. If it does not, the aggregator usually requires the project to pay a financially penalty

**Lenders request long term forecasts of negative price hour per annum from an independent advisor**

- Analyses differ dramatically between advisors, from 15 to 300 hours lost per year
- Technical advisors offer that service but usually from external consultants, which banks tend to dislike
- Banks prefer merchant advisors (surprisingly the most optimistic thus far)

**How the base case is changed from this new risk structure (Green Giraffe proprietary home made secret)**

- The debt is sized on the basis of a reasonable number of negative price hours curve
- During the project life, if in a given year the project materially deviates from the original forecast a lock-up is triggered
- If the lock-up is activated for more than 2 years in a row, the amount on the lock-up account will be used to prepaid the debt to restore the project LLCR (pro-rata cash sweep)

## We consider negative prices to be the main risk for projects under French CfD

# OFATE – Debt financing in the PV tenders context

## Table of contents

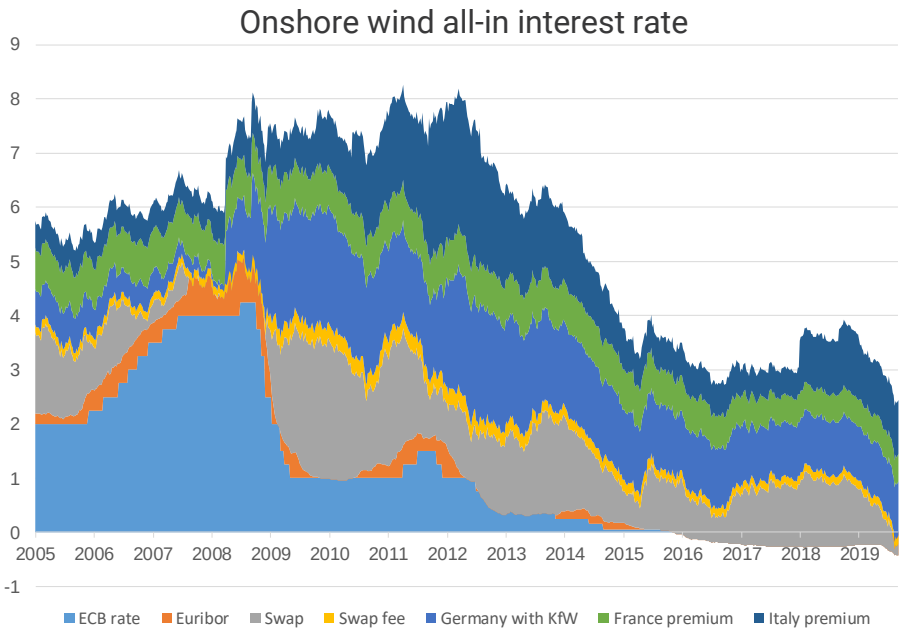


# 3. Current debt market trends

## All-in interest rate is plummeting

All-in interest rates have decreased since 2014

- Were relatively stable until 2014, base rate and margins being compensated by ECB rate
- Have decreased since 2014 to an all-time low today
- Onshore wind risk margin remained around 70 bps




*Source: BloombergNEF*

## Active lenders

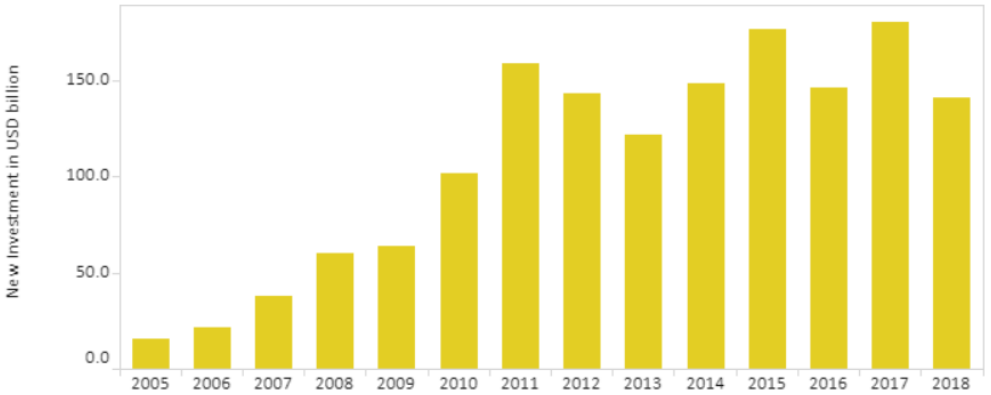
| | Lenders |
|---|---|
| Small projects<br>< 30 MW | French regional banks<br>• CIC<br>• CEPAC<br>• Natixis Energeco<br>• Crédit Agricole regional banks<br>• Auxifip<br>• Crédit coopératif<br>German banks<br>• Saar LB<br>• Nord LB<br>• Hamburg CB |
| Big projects<br>> 30 MW | French banks<br>• Natixis<br>• Société Générale<br>• BNP Paribas<br>• Crédit Agricole<br>International banks |

# 3. Current debt market trends

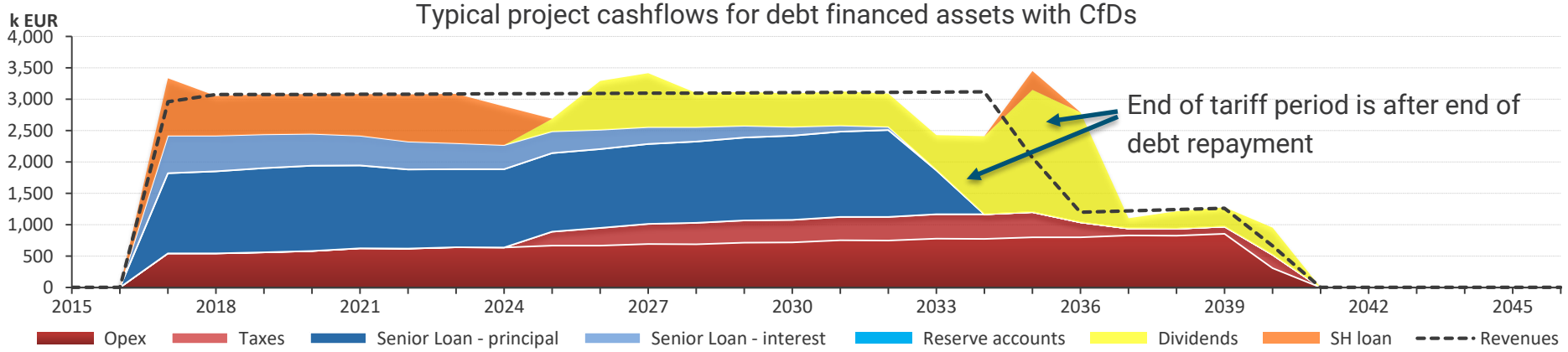
## How we see the current debt market for assets with CfDs

| | Debt terms |
|---|---|
| Margin | 95–105 bps |
| Sizing min. P90 DSCR | 1.15x |
| Max. gearing | 90% |
| Debt tenor | CfD – 1 year |

New solar financing globally (IRENA data)

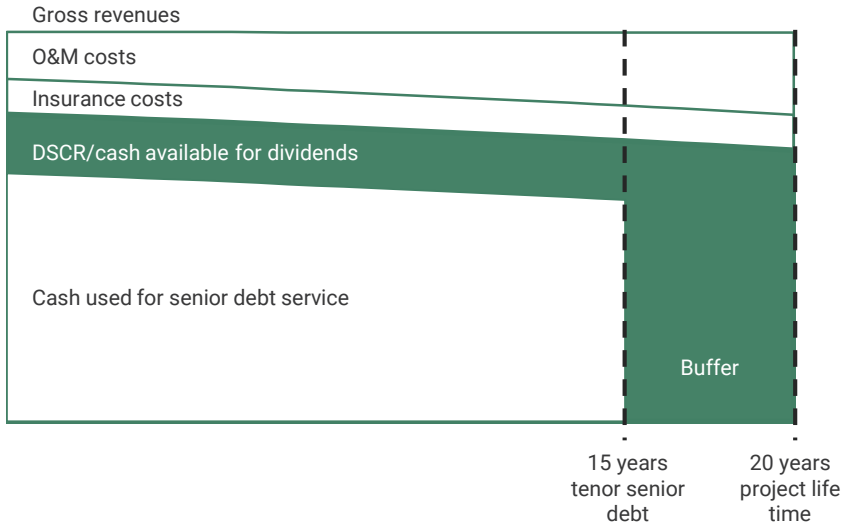



Typical project cashflows for debt financed assets with CfDs



# 3. Current debt market trends

## Revenue side constraint – Low/no tariff




## Capex constraint – Current tariffs

| | | |
|---|---|---|
| Total capital expenditures | | |
| Construction | Modules | Or EPC wrap |
| | Structures | |
| | Electricals | |
| | Inverters | |
| | Insurance | |
| | Construction management | |
| | Development costs | |
| Finance | MLA and DD costs | |
| | Debt fees (arranging & commitment) | |
| | Interest during construction | |
| | DSRA/DSRF costs | |

Equity and quasi equity

Senior debt

P90 DSCR constraint on fixed-price revenues: 1.15x

- Same under CfD as under previous FiT
- Discussions on LT O&M and inverter replacement budget
- Contracted O&M & insurance cost assumptions

Higher DSCR constraint for merchant price revenues

Debt : Equity < 90:10

- No tolerance for junior debt mechanisms
- Usually equity can be paid pro-rata debt drawdowns

Gearing is no longer a constraint on a refinancing


# Green Giraffe

The renewable energy financial advisors

BOSTON • CAPE TOWN • HAMBURG • LONDON • PARIS • UTRECHT

green-giraffe.eu