



Creating 24/7 Clean Energy Supply

October 13, 2020



EDF Value Proposition

The EDF Group is a **Global Energy Company** Committed to **Helping Corporate Customers**
Access Carbon-Free Energy

Extensive Corporate Contracting Experience and a Commitment to Decarbonization

- 2350 MW of Corporate Contracts across North America, South America and Europe
- 40% Carbon Reduction Goal by 2030

Global Scale and Pipeline in Key Markets

- Pipeline visibility in wind, solar and storage out to 2024 and beyond across North America, the EU and the rest-of the world

A Trusted Partner with Broad Resources

- As of December 2019, nearly €30B current financial assets to weather any storms

Transaction Structuring Flexibility to Accommodate a Broad Range of Market Structures and Needs

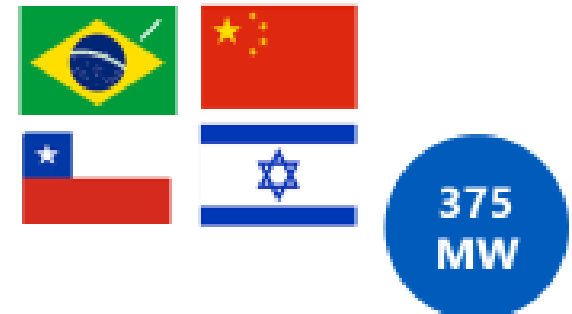
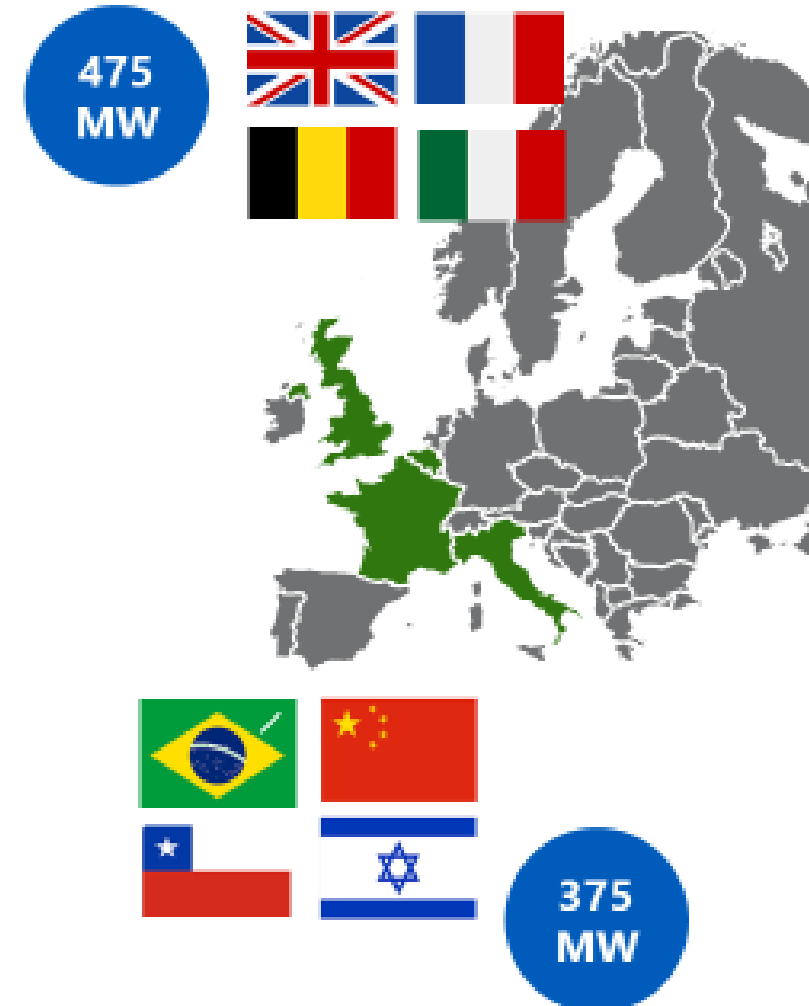
- Retail, Wholesale, Structured Products, Storage

International Corporate PPA Position

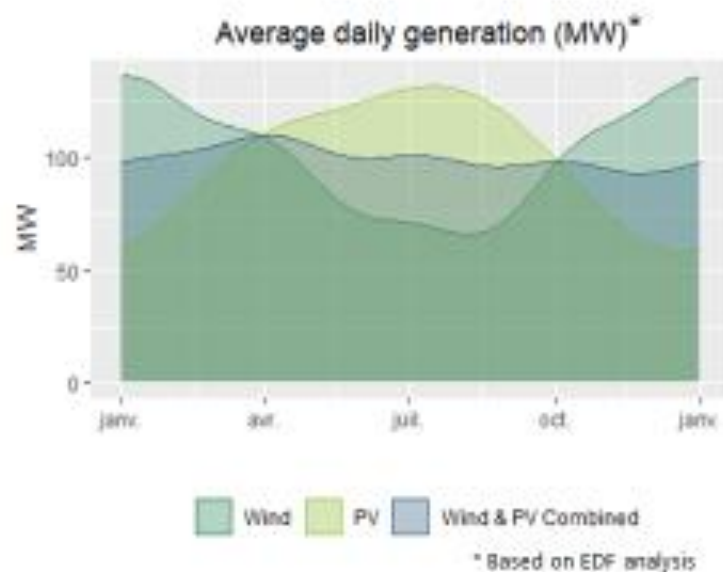


- 2,350 MW contracted with corporates worldwide
- More diverse customers and more MWs with Corporate than any other developer
- C – PPA with all renewable technologies, mainly additional, but also existing assets

The EDF Group has developed a **leading C-PPA portfolio** globally, supported by the development of additional renewable assets and the sale of green energy to our customers through the retailers of the Group in France, USA, Italy, UK and Belgium

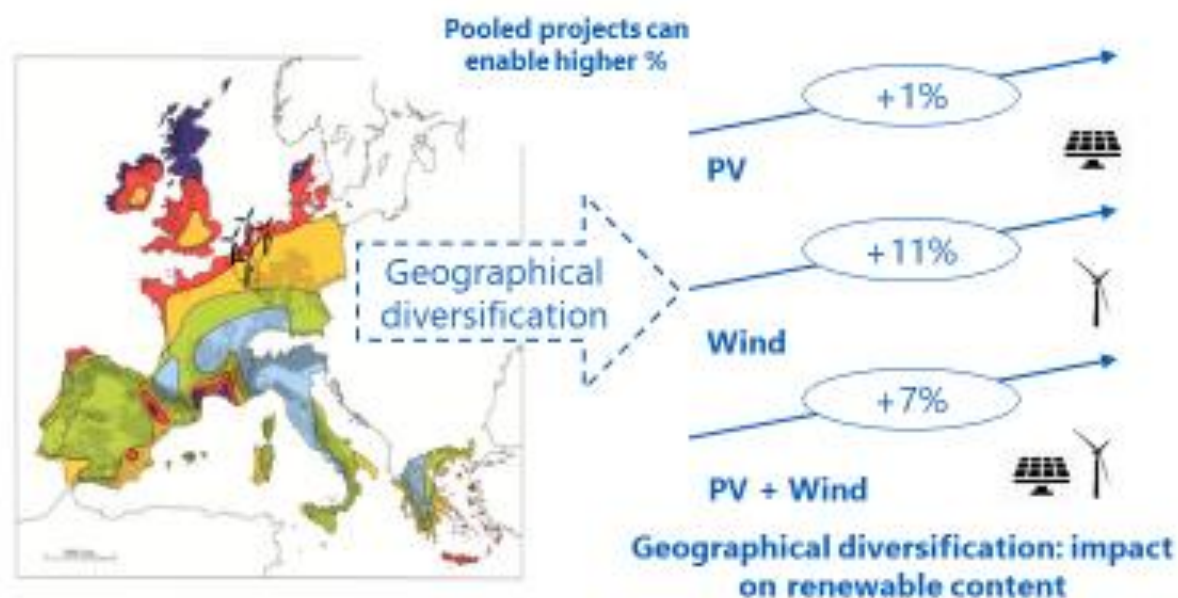


DIVERSIFYING THE SUPPLY TO MAXIMIZE THE CFE CHOOSING THE RIGHT TECHNOLOGIES AND LOCATIONS TO OPTIMIZE CFE OBJECTIVES



Stochastic simulation shows that combining wind and solar into the same defined quantity hedge, reduces the revenue volatility compared to the wind or solar DQ hedge individually

Choosing the **renewable projects to optimize the mix of technologies** in the supply will help to **optimize CFE** at low cost and reduce financial risk

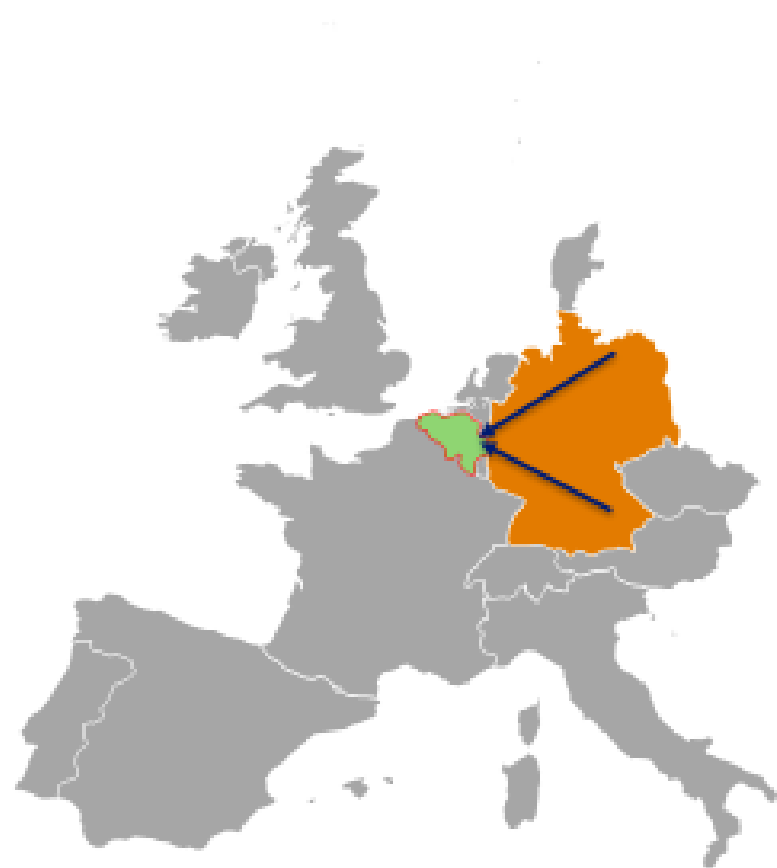


Because European winds are not synchronous, simulation shows that the diversification of the location of the renewable assets can **improve by 10% +** the renewable content of the supply, at a very limited cost

Choosing the **right location of the sourcing** to diversify the complementarity of the weather conditions and optimize CFE

DIVERSIFYING THE SUPPLY IN AREAS WITH HIGHER CARBON INTENSITY TO MAXIMIZE BOTH CFE & CRI

Example: DC in Belgium & PPA diversification in Germany



- Average CFE in Belgium: 55% in 2018 (exceptionally low due to several nuke outages)
- CFE with wind CPPA in Belgium only: 75%
- CFE with wind CPPA in Germany: 82%
- +40% CO2 tons avoided versus CPPA in Belgium

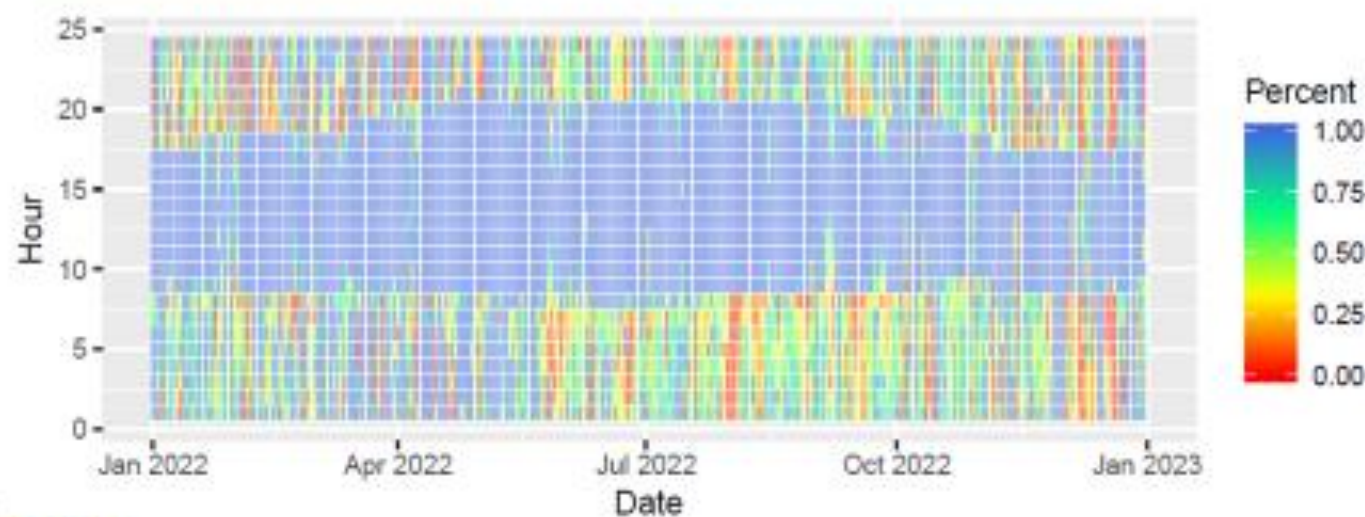
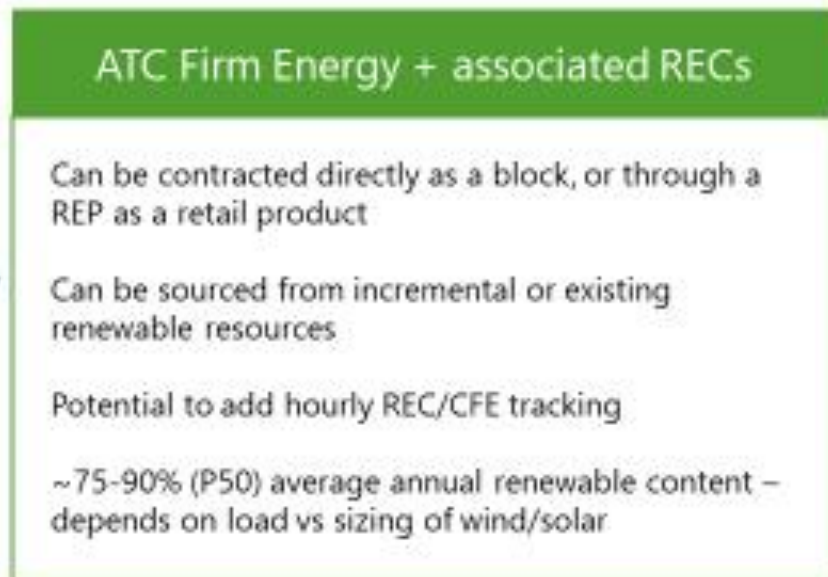
		
Marginal power plant	Gas	Gas / Oil
tCO2 / MWh (average)	0.55	0.76
10 ⁷ tons CO2 avoided	462	694

PRODUCT #EUROPE STRUCTURING ACROSS GEOGRAPHIES

Because Belgium is a low carbon intensity country, contracting CPPA in areas with higher carbon intensity will maximize both CFE and carbon reduction impact

PRODUCT #USA

"FLAT BLOCK" PRODUCT STRUCTURE



Highly liquid power markets such as ERCOT (Texas) allow for two non-located projects to commit offtake to a single structured product

Example: ERCOT CFE Level 85%



• Baseline Grid Conditions

HR	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan2
0	43%	40%	35%	30%	40%	30%	34%	32%	42%	52%	52%	44%	46%
1	43%	50%	55%	50%	50%	38%	34%	31%	41%	52%	52%	44%	46%
2	43%	50%	55%	60%	40%	37%	34%	31%	41%	52%	50%	44%	45%
3	42%	50%	54%	58%	43%	36%	33%	31%	40%	52%	49%	44%	45%
4	42%	40%	52%	57%	47%	34%	32%	29%	38%	50%	48%	44%	43%
5	41%	46%	49%	53%	45%	32%	30%	28%	36%	47%	45%	43%	41%
6	30%	43%	46%	51%	43%	30%	28%	28%	34%	46%	43%	43%	39%
7	30%	42%	45%	50%	40%	29%	26%	25%	32%	44%	42%	40%	36%
8	40%	42%	40%	48%	37%	28%	24%	23%	32%	44%	43%	40%	37%
9	41%	42%	44%	48%	38%	29%	25%	25%	32%	41%	42%	42%	37%
10	38%	39%	44%	40%	39%	30%	23%	23%	32%	41%	40%	39%	37%
11	38%	38%	44%	49%	39%	29%	24%	25%	30%	41%	40%	37%	36%
12	38%	38%	44%	40%	38%	29%	23%	23%	29%	41%	39%	37%	36%
13	38%	38%	43%	49%	38%	29%	23%	25%	28%	40%	39%	36%	36%
14	38%	38%	43%	48%	38%	30%	24%	24%	29%	40%	39%	36%	36%
15	38%	38%	43%	48%	38%	31%	24%	26%	29%	39%	38%	36%	36%
16	38%	38%	43%	48%	39%	32%	23%	24%	29%	39%	38%	33%	36%
17	37%	37%	43%	48%	39%	32%	25%	27%	29%	39%	38%	34%	36%
18	35%	36%	43%	48%	39%	33%	28%	27%	30%	39%	39%	34%	36%
19	37%	36%	42%	48%	39%	34%	27%	26%	32%	41%	41%	36%	37%
20	39%	39%	40%	50%	41%	34%	28%	28%	34%	45%	43%	37%	38%
21	40%	41%	48%	53%	44%	36%	30%	31%	38%	48%	46%	38%	41%
22	42%	44%	51%	56%	47%	38%	33%	32%	40%	51%	48%	40%	43%
23	43%	47%	55%	57%	49%	39%	34%	32%	41%	52%	50%	42%	45%

• Solar Shape

HR	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5	0%	0%	0%	0%	0%	1%	1%	0%	0%	0%	0%	0%
6	0%	0%	0%	34%	65%	82%	69%	41%	22%	7%	0%	0%
7	10%	23%	54%	88%	84%	85%	82%	90%	93%	86%	53%	17%
8	62%	55%	78%	93%	90%	96%	100%	97%	97%	91%	85%	68%
9	75%	84%	90%	93%	93%	100%	99%	98%	98%	92%	88%	73%
10	86%	73%	94%	97%	98%	100%	99%	100%	97%	94%	92%	82%
11	87%	83%	98%	98%	99%	100%	100%	97%	98%	98%	93%	87%
12	88%	81%	96%	99%	99%	99%	100%	100%	95%	100%	92%	83%
13	88%	78%	94%	98%	99%	98%	97%	100%	95%	98%	93%	81%
14	88%	78%	94%	98%	95%	95%	98%	98%	94%	96%	91%	76%
15	82%	73%	91%	94%	94%	93%	97%	96%	89%	93%	90%	77%
16	72%	67%	81%	91%	89%	86%	94%	94%	82%	90%	79%	66%
17	18%	53%	70%	82%	83%	83%	83%	91%	84%	52%	3%	3%
18	0%	0%	10%	22%	38%	66%	62%	37%	3%	0%	0%	0%
19	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%
20	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
21	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

• Wind Shape

HR	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	62%	59%	77%	76%	75%	75%	68%	70%	62%	66%	63%	68%
1	63%	59%	75%	74%	72%	70%	66%	69%	60%	62%	63%	69%
2	63%	62%	78%	71%	70%	65%	63%	61%	56%	59%	62%	60%
3	62%	64%	74%	69%	65%	58%	57%	53%	52%	57%	61%	55%
4	63%	57%	73%	70%	61%	50%	54%	59%	49%	57%	64%	56%
5	62%	59%	75%	70%	58%	48%	53%	53%	43%	57%	65%	55%
6	58%	63%	70%	70%	49%	44%	46%	44%	33%	55%	62%	52%
7	57%	60%	63%	67%	47%	38%	34%	35%	30%	50%	59%	50%
8	55%	56%	56%	58%	46%	39%	28%	26%	23%	46%	53%	49%
9	55%	51%	45%	54%	49%	39%	23%	23%	22%	42%	52%	44%
10	48%	48%	44%	55%	48%	38%	20%	18%	21%	38%	45%	38%
11	44%	51%	43%	55%	46%	34%	19%	19%	19%	34%	41%	35%
12	39%	46%	38%	55%	46%	32%	19%	10%	19%	32%	40%	32%
13	38%	45%	34%	56%	48%	32%	19%	10%	18%	32%	42%	34%
14	39%	43%	37%	55%	53%	34%	20%	11%	19%	32%	43%	37%
15	40%	40%	38%	54%	53%	37%	21%	13%	16%	33%	43%	37%
16	38%	37%	40%	59%	55%	40%	23%	17%	20%	35%	44%	38%
17	41%	42%	38%	59%	55%	40%	24%	19%	18%	43%	47%	42%
18	50%	48%	38%	61%	56%	52%	38%	30%	23%	51%	49%	50%
19	57%	52%	44%	78%	60%	63%	45%	43%	38%	63%	52%	59%
20	60%	63%	52%	82%	73%	66%	57%	56%	52%	66%	59%	65%
21	62%	66%	60%	86%	76%	73%	64%	64%	57%	73%	62%	69%
22	60%	66%	68%	86%	79%	78%	67%	69%	63%	72%	65%	69%
23	59%	59%	73%	82%	77%	74%	67%	71%	64%	76%	65%	70%

• NET Hourly CFE

HR	1	2	3	4	5	6	7	8	9	10	11	12
0	34%	76%	88%	88%	84%	81%	77%	78%	78%	81%	79%	79%
1	75%	77%	87%	88%	83%	78%	75%	78%	76%	80%	80%	78%
2	75%	79%	87%	88%	83%	75%	74%	72%	74%	78%	79%	77%
3	74%	79%	86%	85%	81%	71%	70%	67%	72%	78%	79%	73%
4	75%	77%	84%	85%	78%	66%	68%	66%	69%	77%	80%	74%
5	74%	77%	82%	84%	76%	63%	67%	66%	68%	76%	80%	73%
6	73%	77%	85%	91%	92%	91%	91%	84%	72%	77%	77%	70%
7	76%	84%	92%	99%	97%	94%	97%	99%	98%	95%	91%	77%
8	87%	89%	97%	100%	98%	98%	100%	100%	96%	98%	98%	94%
9	92%	91%	99%	99%	98%	100%	100%	100%	100%	97%	98%	95%
10	95%	92%	99%	100%	100%	100%	100%	100%	99%	98%	98%	95%
11	95%	97%	100%	100%	100%	100%	100%	98%	99%	100%	98%	96%
12	96%	96%	99%	100%	99%	99%	100%	100%	98%	100%	98%	94%
13	96%	94%	100%	100%	100%	99%	100%	97%	99%	99%	98%	93%
14	98%	95%	99%	100%	99%	99%	100%	98%	98%	98%	97%	90%
15	94%	90%	98%	99%	98%	97%	99%	97%	95%	97%	97%	93%
16	92%	88%	95%	99%	98%	93%	96%	98%	92%	98%	93%	87%
17	71%	96%	90%	97%	99%	93%	90%	96%	85%	78%	68%	62%
18	67%	63%	69%	84%	88%	89%	88%	78%	51%	68%	68%	67%
19	73%	67%	68%	84%	74%	71%	80%	58%	57%	74%	70%	72%
20	73%	73%	72%	88%	80%	75%	67%	68%	68%	78%	74%	75%
21	74%	77%	77%	90%	83%	79%	73%	74%	72%	82%	78%	78%
22	74%	78%	82%	93%	84%	81%	75%	77%	77%	83%	78%	74%
23	73%	76%	82%	90%	84%	81%	76%	78%	78%	83%	80%	80%

Full Requirement Supply



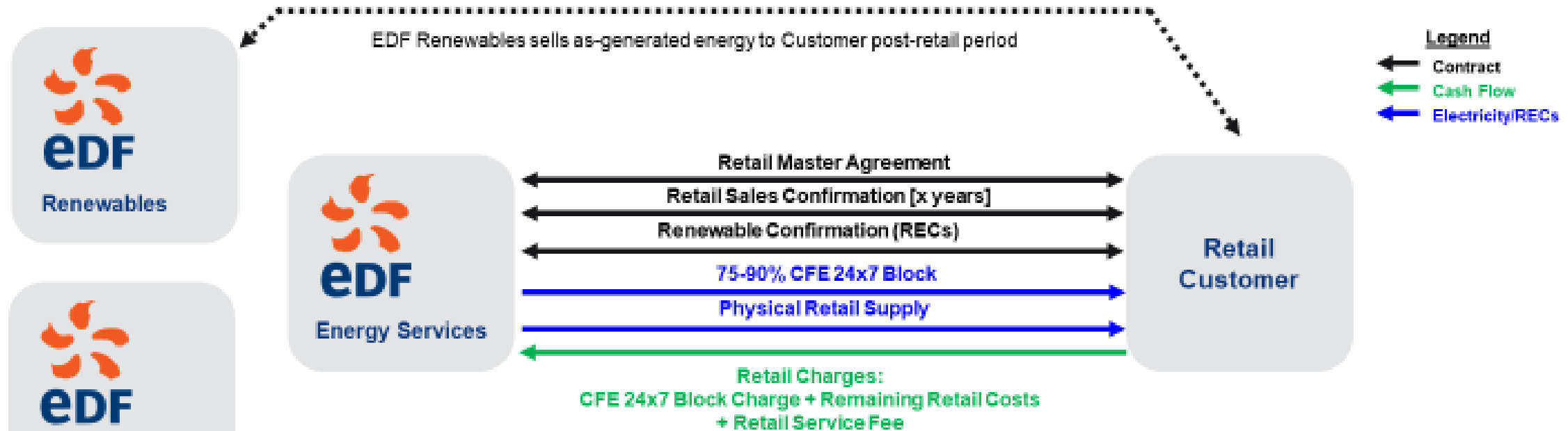
- EDF ES can offer retail contracts in nearly all competitive markets.
- In other States, the power will be delivered **at the hub**, and a **sleeved PPA** is implemented



- EDF can offer retail contracts in 4 countries in Europe, where our commercial positions are strongest
- In other countries, the power will be delivered **at the hub**, and a **sleeved PPA** is implemented

The electricity can be delivered either **through retail contracts where EDF is a retailer** or **sleeved into an existing retail contract**

Retail Structure: [x] year 75-90+% CFE 24x7 Block including retail agreement

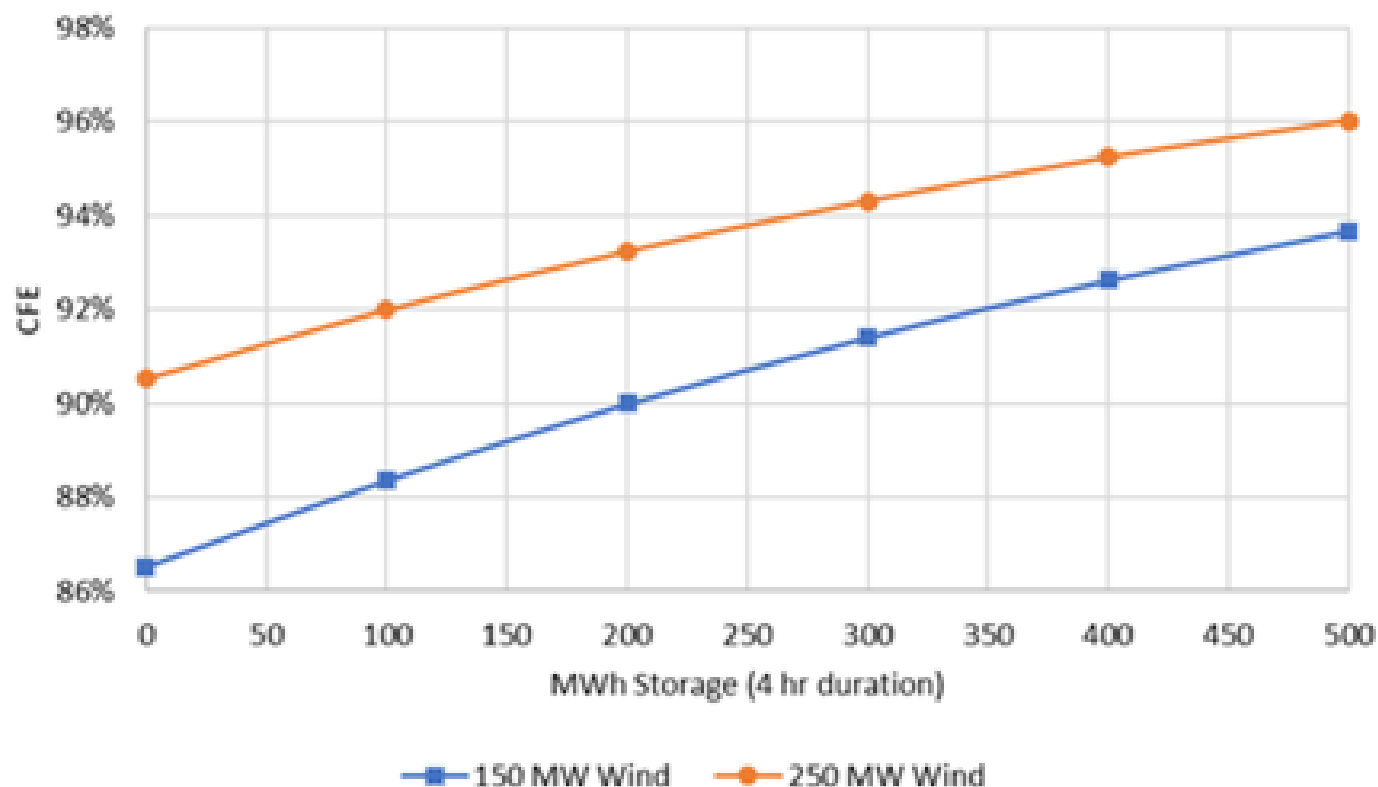


- Additional considerations:
- portability, ability to change REP
 - Security
 - Accounting treatments
 - Timing of project CODs
 - Market rules

Paired storage can increase CFE



Increasing CFE by varying storage and wind:



- In wholesale markets such as France and Texas EDF's analysis shows that adding a battery to increase CFE will come at 3-10% increase to product cost.
 - This is because CFE "gaps" are not correlated to market price peaks.
- In certain bilateral markets and California however, storage can be added to solar to increase CFE to create a "peak block" at marginal cost.

Holistic approach to achieve 24x7 CFE targets



ASSET DEVELOPMENT



- On-site/Off-site renewable and storage assets development (design, build, operate, maintain)
- Energy management systems to maximise CFE

GREEN SUPPLY



- Renewable Sourcing (C-PPA)
- Sourcing diversification
- Product structuring
- Full requirement supply

MARKET STRUCTURING



- 24x7 CFE optimisation
- Hedging facility with access to Trading floor
- Aggregation services (renewables, storages, DSR)

ENERGY SERVICES



- Eco-design
- Zero carbon strategy development & implementation
- Continuous supply
- PUE optimisation (human expertise, Artificial Intelligence, digital twins)
- Mechanical & electrical engineering
- Technical maintenance and Systems integration



Thank You

brilliance, revealed