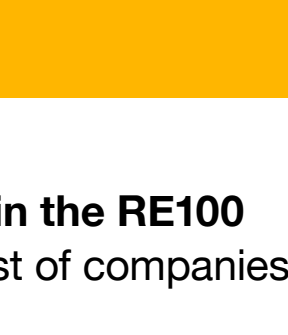


# #energyfacts

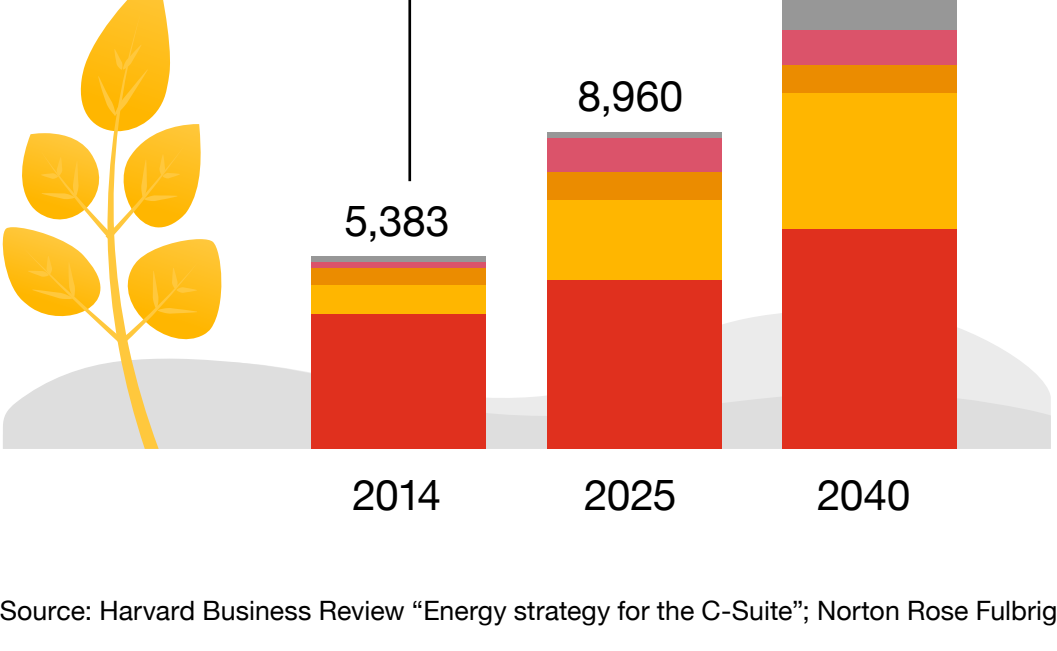
## Power Purchase Agreements – PPA

### Renewable energy on the rise

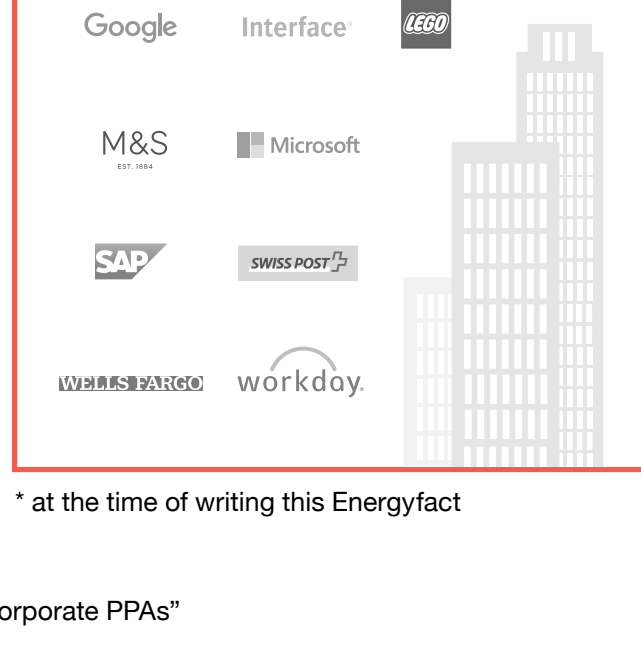
Since the group RE100 made the commitment to run on 100% renewable energy, more corporates are joining the movement globally and seeking to reduce their carbon footprint. The trend for renewable energy will continue to shift upwards as technology development enables more energy generation and the market demands more sustainable practices.



#### Absolute volume of renewable electricity generation worldwide, TWh



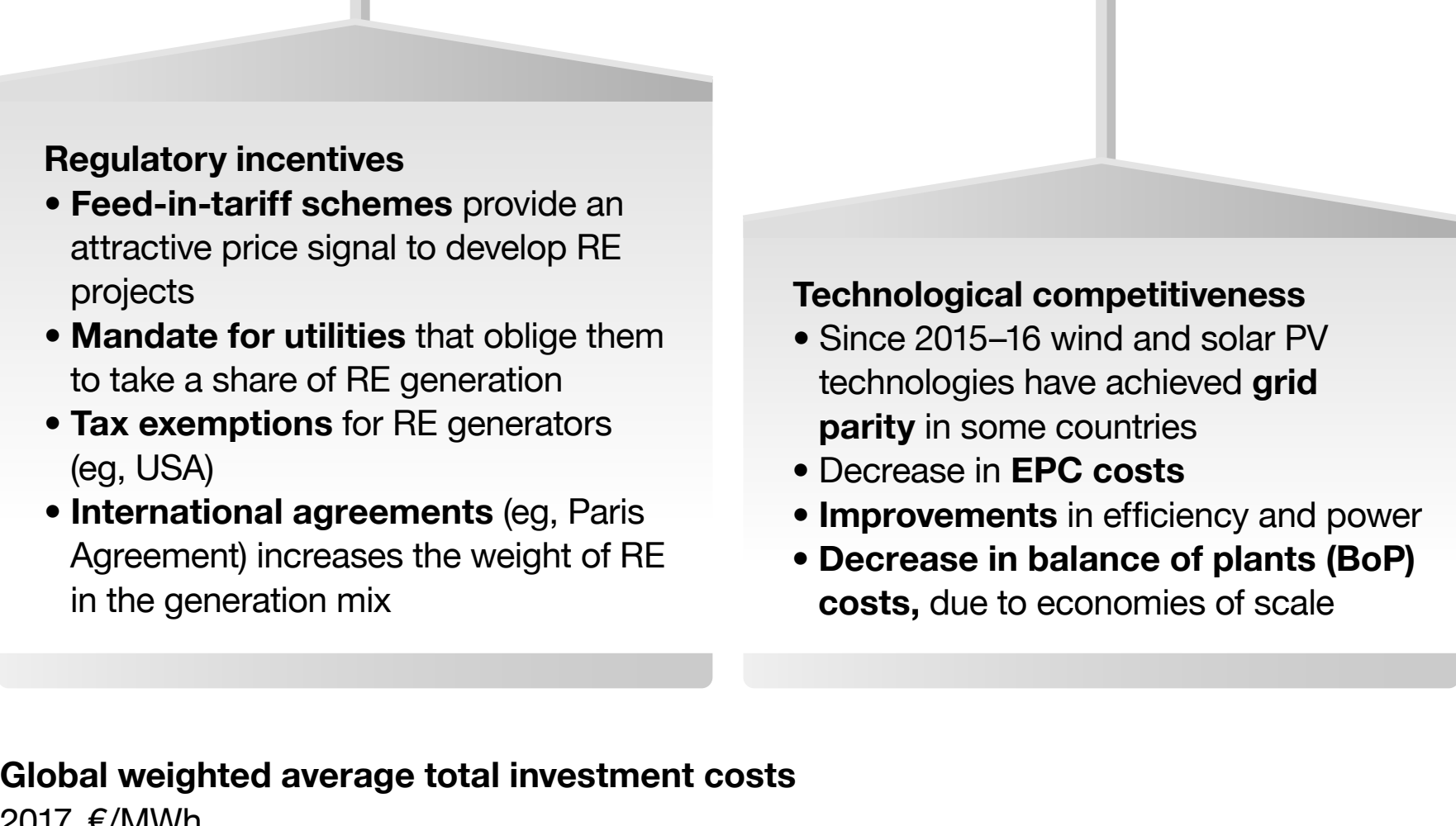
#### 191\* companies in the RE100 (non-exhaustive list of companies)



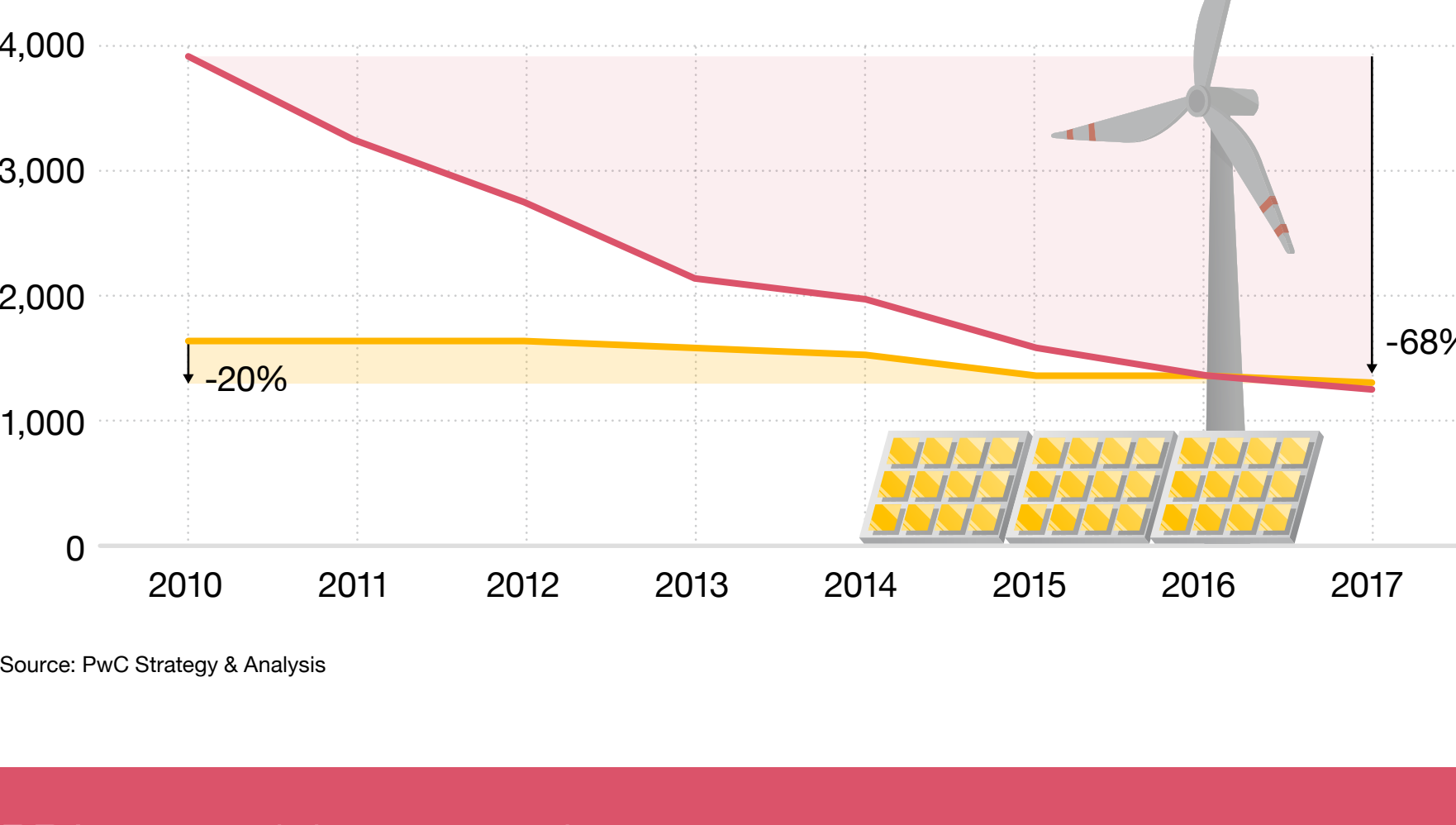
Source: Harvard Business Review "Energy strategy for the C-Suite"; Norton Rose Fulbright "Corporate PPAs"

### From policy push to technology pull

In the past, government policies pushed for the adoption of renewable energy. Today, technology advances make it possible to procure renewable energy at lower costs – even more cheaply than power generated from fossil fuels.



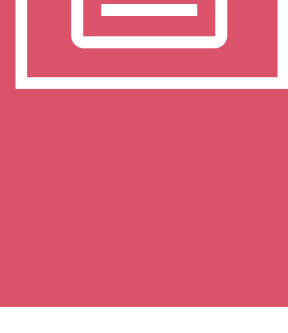
#### Global weighted average total investment costs 2017, €/MWh



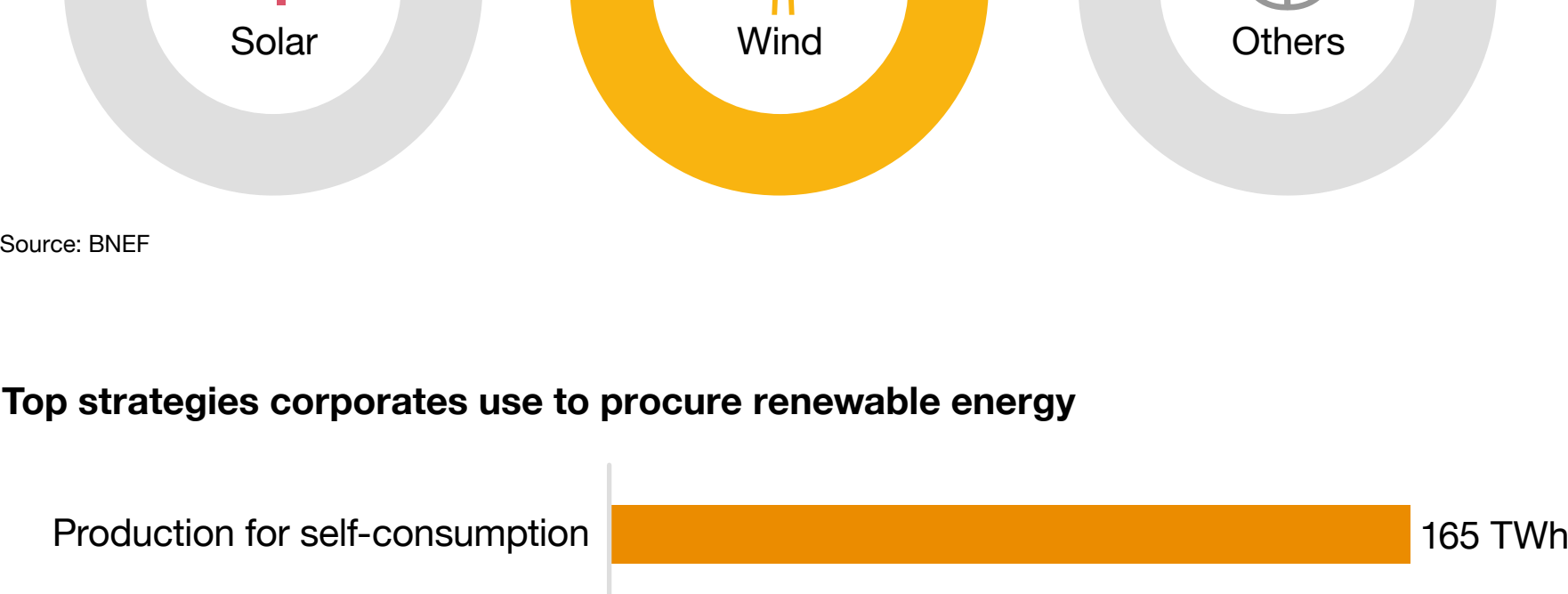
Source: PwC Strategy & Analysis

### PPAs are gaining popularity

There are a variety of strategies to procure renewable energy, but lately power purchase agreements (PPA) have been generating interest among corporations as a vehicle to reduce carbon emissions whilst procuring energy at lower costs. In Europe, most PPA deals are renewable energy generated by wind technology. In 2018, 1.5 GW of new PPA deals with wind farms were signed in Europe, which included the first offshore wind PPA deal. In terms of countries, Norway and Sweden are the countries with the most signed PPA deals in Europe, followed by Denmark, UK and the Netherlands.

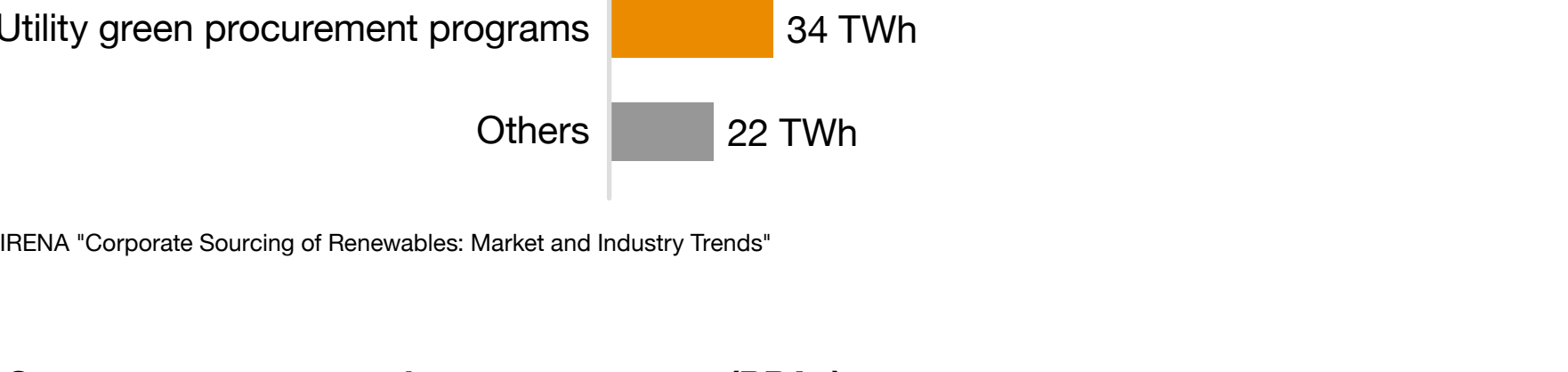


#### Corporate PPAs in the EU by technology



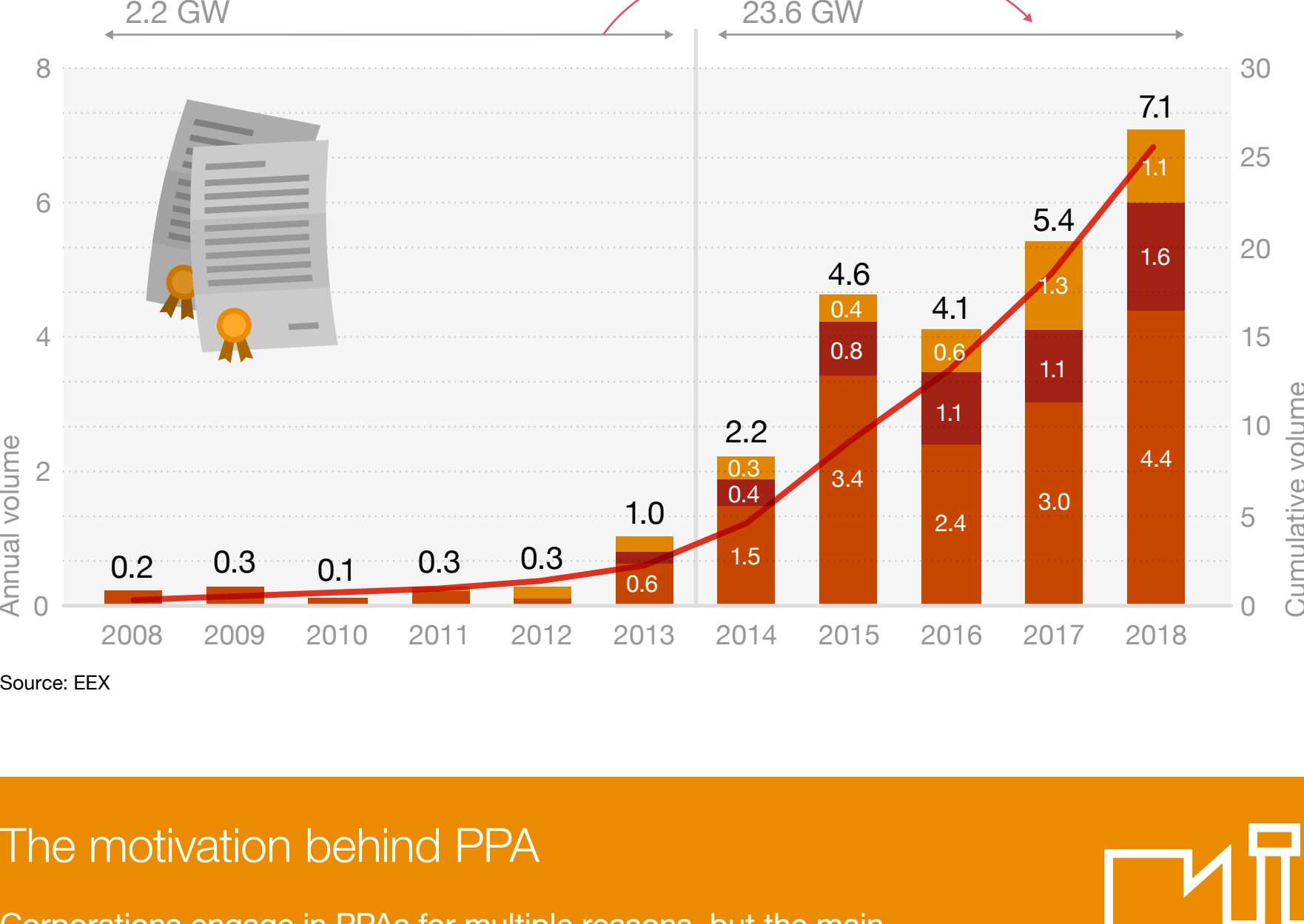
Source: BNEF

#### Top strategies corporates use to procure renewable energy



IRENA "Corporate Sourcing of Renewables: Market and Industry Trends"

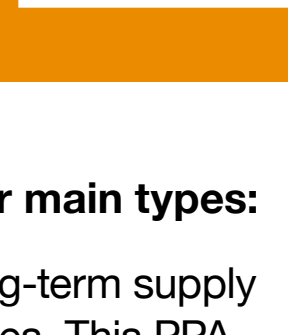
#### Corporate power purchase agreements (PPAs) Worldwide, GW of capacity



Source: EEX

### The motivation behind PPA

Corporations engage in PPAs for multiple reasons, but the main motivation is to meet their sustainability goals and have claim to a green image. In 2018, renewable energy capacity increased due to a boom of companies pursuing renewable energy procurement.

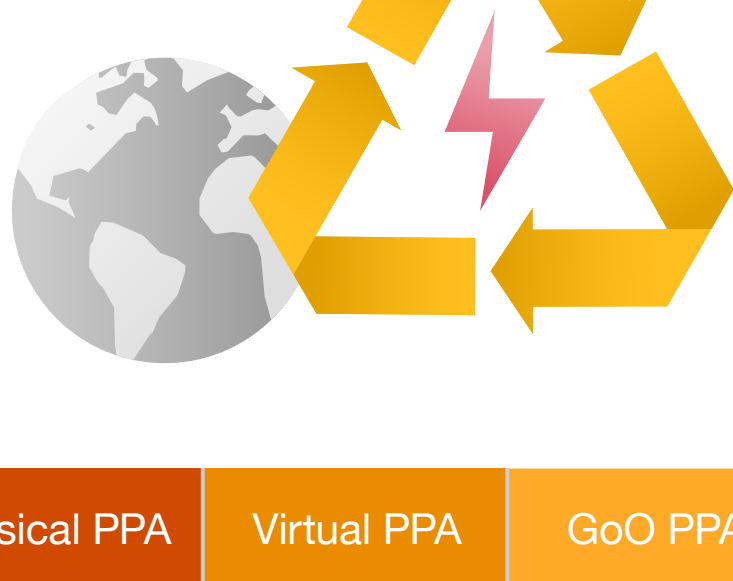
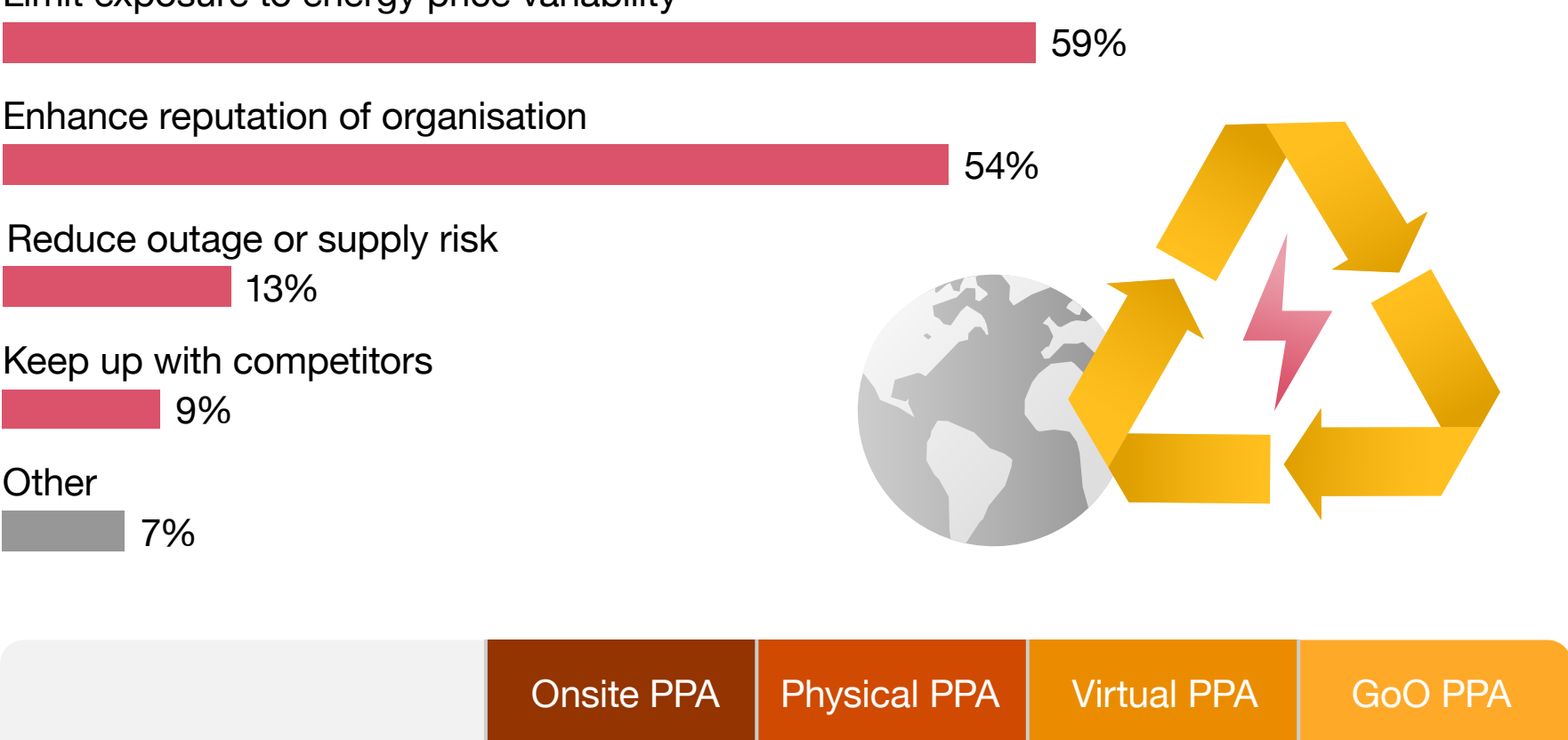


#### There are various structures for PPAs, but they can be classified into four main types:

- **Onsite PPA**, a direct physical supply of power where the plant site is in the proximity of the off-taker (behind the metering of the off-taker).
- **Physical PPA**, physical power supply where the power is delivered through the grid and the plant site does not need to be in the off-taker's operating location.
- **Virtual PPA**, an indirect power supply that focuses on financial settlement using a contract for difference between the off-taker and the asset owner.
- **Guarantees of origin PPA**, long-term supply of renewable energy certificates. This PPA can be bundled with other PPA structures.

Choosing the right PPA structure depends on many variables, which should be aligned with the main motivation for companies to engage in PPA.

#### Drivers of intent to purchase renewable energy

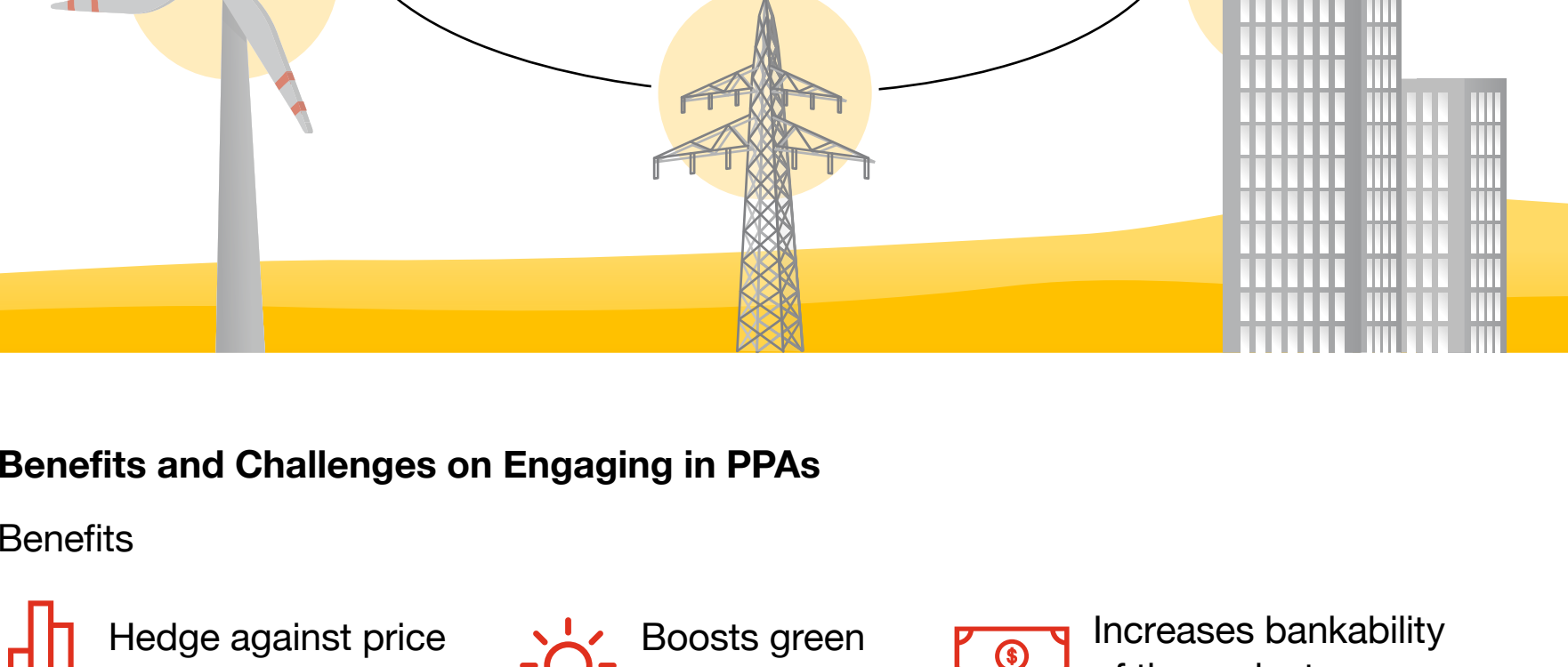


	Onsite PPA	Physical PPA	Virtual PPA	GoO PPA
Sustainability goals	✓	✓	✓	✓
Attractive ROI	✓	✓	✓	✓
Risk management/hedge price	✓	✓	✓	
Stay competitive	✓	✓	✓	

Source: PwC Analysis

### Power purchase agreement – definition

Power Purchase Agreement (PPA) is a long-term agreement between an off-taker and an asset owner that allows the off-taker to purchase power on a long-term basis for a price level agreed by the parties. Asset owners can be power developers or suppliers. Depending on the contract structure and the capability of the corporate, the physical delivery of power can either be transmitted directly to the off-taker's grid, or indirectly, where the off-taker receives power from its supplier.



#### Benefits and Challenges on Engaging in PPAs

- #### Benefits

  - Hedge against price and volume volatility
  - Provides price certainty
  - Boosts green image
  - Enables more flexibility
  - Increases bankability of the project
  - Builds strong relationships between the parties involved

#### Challenges

  - Unstandardised contracts
  - Determining the terms
  - Multiple counterparties involved, leading to long negotiations
  - Exposure to weather risks, leading to higher uncertainty in forecasts
  - Selecting counterparties
  - Managing risks and complexity

Source: PwC Analysis

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