

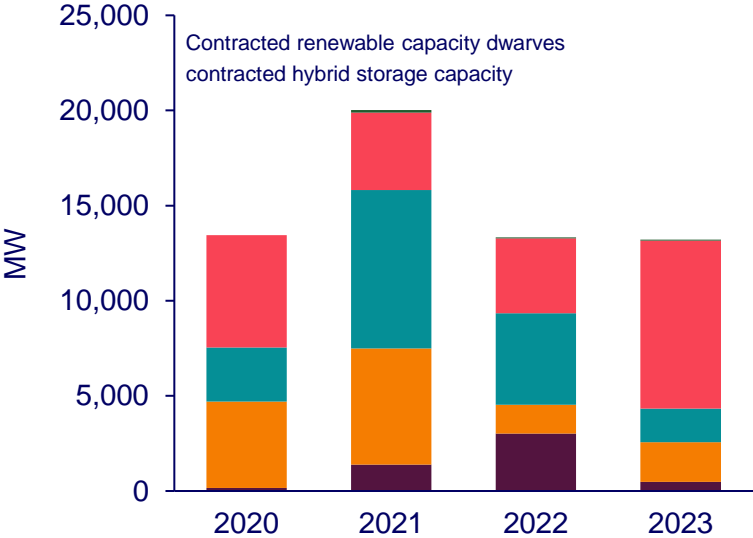
PV magazine



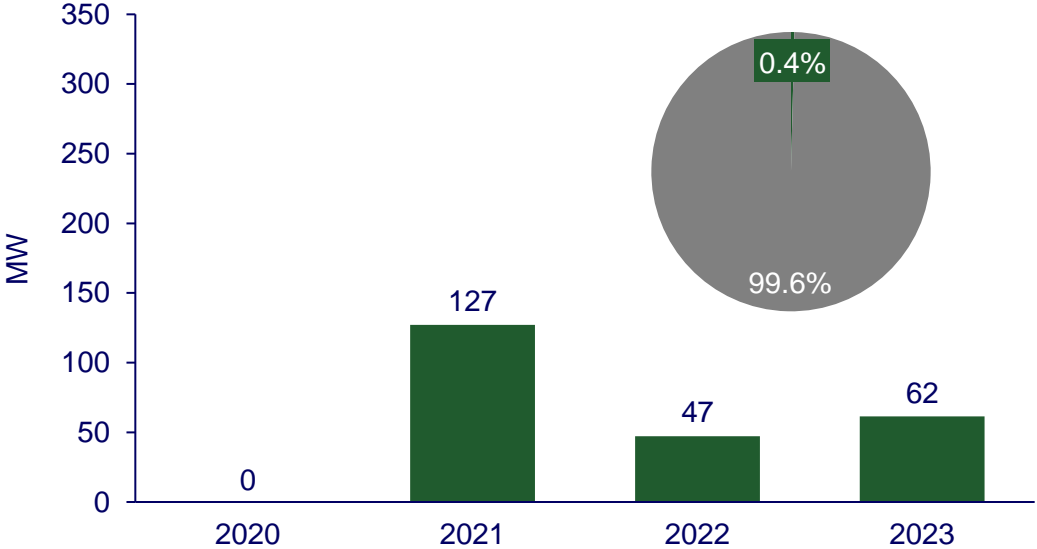
PPAs have been an attractive route to market for renewable projects in Europe

But less than 1% of total PPA capacity contracted include energy storage

PPA capacity contracted per year



Storage PPA capacity contracted per year

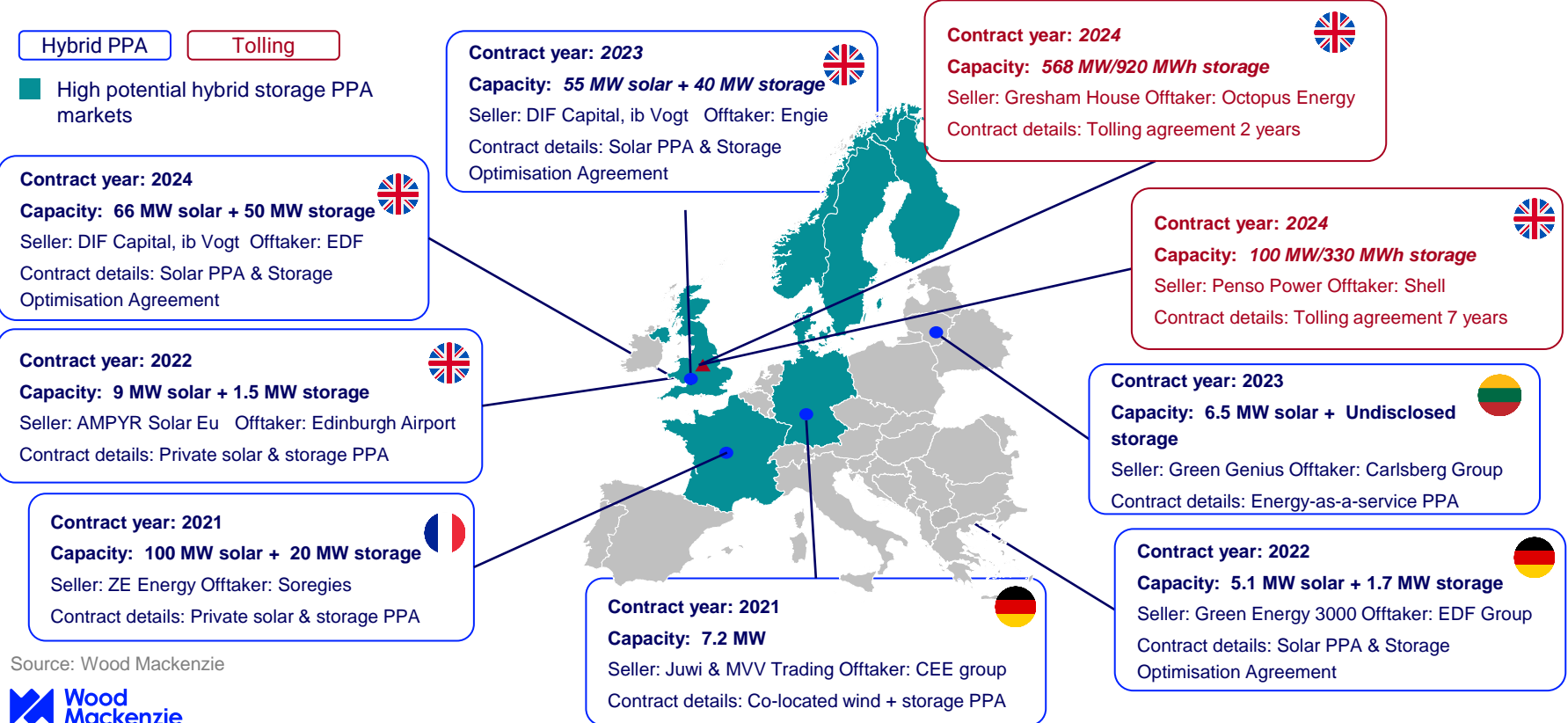


Hybrid storage Solar Onshore wind Offshore wind Portfolio

Source: Wood Mackenzie

So far 7 hybrid PPA contracts are signed across 4 markets, along 2 tolling agreements

That said, contracted capacity is expected to accelerate as the pricing landscape for renewables changes

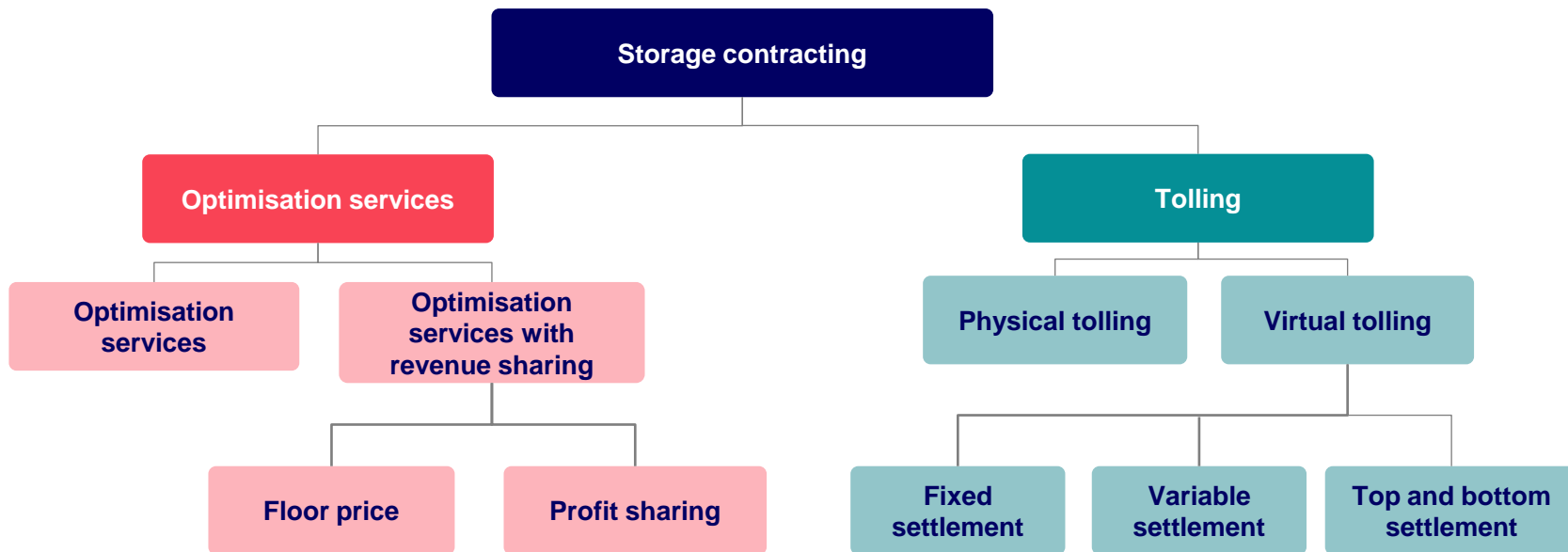


Source: Wood Mackenzie

Storage contracting will become widespread across Europe, after being the main route to the market in the US over the past years

Contract terms depends on use cases as well as the risk appetite of owner and offtaker

Different types of storage contracts

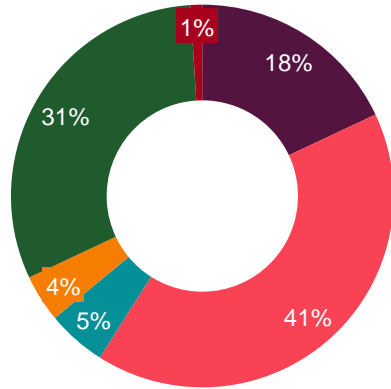


Source: Wood Mackenzie

In Europe, utilities, energy power producers and industrial players will be the most interested parties in energy storage offtake contracts

However, adding energy storage to PPA and offtake contracts comes with different motives

Share of offtaker type (all Europe deals), 2023



- Industry
- Utility
- Technology & data
- Power and energy producers
- Retail and services
- Others

Category	Example	Motivation to include storage	Preferred Contract type
Industry	Manufacturing, chemical	Peak shaving, 24/7 demand matching	Virtual tolling (variable settlement), hybrid PPA
Technology & data	Data centers	Peak shaving, 24/7 demand matching	Virtual tolling (variable settlement), hybrid PPA
Retail and services	Supermarkets	24/7 demand matching	Virtual tolling (fixed settlement), hybrid PPA
Utility	Utility companies	Grid-services, firming and ramp control	Optimisation, physical tolling
Power and energy producers	IPP, Oil and gas companies	Grid-services, firming and ramp control	Optimisation, physical and virtual tolling

Less interest Larger interest

Source: Wood Mackenzie

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