

## Update from the Field

November 2023

**ONLINE SESSION** 

November 23<sup>rd</sup>, 2023 - 10 am - 11 am (CEST)



### **Update From The Field**

#### November 2023

Every month, Clean Horizon's team of energy storage experts delivers an analysis of key data and trends affecting the energy storage industry worldwide. This monthly report updates and analyzes new relevant regulations, monitors commissioned and announced projects, and provides a specific focus on key market trends which are likely to have a direct impact on industry stakeholders.

### **Table of Contents**

| Executiv | e summary   | 5            |
|----------|---|--------------|
| 1.       | New regulations and initiatives discussed this month  | 6            |
| 1.1.     | America   | 6            |
| 1.2.     | Europe  | 7            |
| 2.       | Project updates and announcements   | 8            |
| 2.1.     | Overview of the 2022 and 2023 markets for utility-scale energy storage projects               | 9            |
| 2.2.     | Projects announced or contracted this month   | 9            |
| 2.3.     | Projects commissioned this month  | 11           |
| 3.       | Focus of the month: Intraday markets in Europe: Auction and Continuous. Depth and op 12       | portunities? |
| 3.1.     | Introduction to the intraday markets  | 12           |
| 3.2.     | Generating revenues on the intraday market  | 13           |
| 3.2.1.   | Intraday auction  | 13           |
| 3.2.1.1. | Introduction  | 13           |
| 3.2.1.2. | How much can a battery earn on the intraday auction?  | 14           |
| 3.2.2.   | Intraday continuous   | 16           |
| 3.2.2.1. | Introduction  | 16           |
| 3.2.2.2. | How to generate revenues with a battery storage system on intraday continuous?                | 17           |
| 3.2.2.3. | How to place bids on the intraday continuous market?  | 19           |
| 3.2.2.4. | Asset backed trading enables traders to have more flexibility and to generate higher revenues | 20           |
| 3.2.2.5. | Example of intraday continuous revenue calculation for 2021 in Germany                        | 21           |
| 3.3.     | Expected evolutions of the intraday market  | 23           |
| 3.3.1.   | Coupling between countries  | 23           |
| 3.3.2.   | Renewable penetration impacts intraday continuous volumes                                     | 24           |
| 3.3.3.   | Intraday continuous volatility and prices are correlated with day ahead prices                | 26           |



# Table of Figures

| Figure 1: Utility-scale energy storage projects announced/contracted and commissioned in 2022 and 2023 (ongoin           |     |
|--|-----|
| Figure 2 - Intraday auction exchanged volume on EPEX for France, Belgium, Netherlands, Germany, and Austi                |     |
| between 2020 and 2022  | 14  |
| Figure 3 - Revenues generated on the ID auction in Germany in 2022 and 2023  | 15  |
| Figure 4 - Spread on the ID auction and Day ahead markets in 2022 in Germany   | 15  |
| Figure 5 – Example of a book of orders on ID continuous  | 17  |
| Figure 6 - Evolution of the intraday continuous price three hours before delivery  | 18  |
| Figure 7 - Example of virtual cycling on ID continuous (for delivery timeslot 01/01/2021 00:00 – 00:15 in German         | ıy) |
|  | 18  |
| Figure 8 - Example of transactions on ID continuous market   | 19  |
| Figure 9 - Example of virtual cycling on ID continuous with thresholds (for delivery timeslot $01/01/2021$ $00:00-00:00$ | 15  |
| in Germany) – no SOC management accounted for  | 20  |
| Figure 10 - Example of virtual cycling on ID continuous (for delivery timeslot $01/01/2021$ $00:00-00:15$ in German      | ıy) |
| with thresholds based on past operations   | 20  |
| Figure 11 – Transaction volumes on ID continuous (for delivery timeslot $01/01/2021$ $00:00$ – $00:15$ in German         | ıy) |
| Error! Bookmark not define   | d.  |
| Figure 12 - Monthly revenues generated on ID continuous in Germany in 2021   | 21  |
| Figure 13 - Total yearly revenues for various battery sizes  | 22  |
| Figure 14 Exchanged volume in SDIC (Sell side) from July to December 2022 in both Germany and France                     | 24  |
| Figure 12: Intermittent daily renewable energy production and daily ID1 volumes between 01/03/2023 at                    | nd  |
| 31/05/2023   | 25  |
| Figure 13 - Correlation R between renewable energy production volume and ID continuous volume traded (15 m               | nin |
| contracts) in Germany 1 hour before delivery   | 26  |
| Figure 14: Day-ahead and continuous markets daily average prices between 01/03/2023 and 31/05/2023                       | 27  |
| Figure 15:Correlation R between day-ahead and continuous intraday average prices   | 27  |
| Figure 16:Correlation R between day-ahead and continuous intraday daily price spreadError! Bookmark n                    | ot  |
| defined.   |     |
| Figure 17:Correlation R between day-ahead daily price spread and the continuous intraday price differenceErro            | r!  |
| Bookmark not defined.  |     |
| Figure 18:Correlation R hetween imbalance and continuous intraday average prices Front Rookmark not define               | hd  |





#### www.cleanhorizon.com

12 rue de la Chaussée d'Antin

75009 Paris. France

contact@cleanhorizon.com

Tél: +33 (0)1 78 76 57 04

Clean Horizon Americas

1200 BRICKELL AVE, SUITE 1960

MIAMI, FL33131, USA

reports@cleanhorizon.com