



# Market Segment Watch

## Energy Storage in Mexico

### Table of contents

<b>Contents .....</b>	4
<b>Executive summary: Key take-away on energy storage .....</b>	5
<b>1. Introduction.....</b>	6
<b>2. Overview: the Mexican Electricity Sector .....</b>	7
2.1. Regulatory framework .....	7
2.2. The electricity supply chain .....	8
2.2.1. Generation.....	9
2.2.2. Transmission .....	13
2.2.3. Distribution – Consumption.....	16
<b>3. The Mexican Wholesale Electricity Market.....</b>	21
3.1. Long-Term Auctions .....	22
3.2. Medium-Term Auctions .....	24
3.3. Short-Term Markets.....	24
3.4. Investments and the Development Program of the National Electric System .....	27
<b>4. Evolving regulatory and market structures open the way for energy storage development in Mexico</b> 31	
4.1. Current standards and policies regarding energy storage.....	32
4.2. Evolution of the regulatory framework .....	32
4.3. Regulatory gaps and barriers for battery energy storage.....	33
<b>5. Energy storage in Mexico: short-term outlook and rationale for more developments .....</b>	35
<b>5.1. Usages of BESS in Mexico .....</b>	35
<b>5.2. An imperfectly interconnected system witnessing price dichotomies .....</b>	37
<b>6. Glossary .....</b>	40
<b>7. Addendum .....</b>	42
7.1. List of contracts awarded in the three long-term auctions .....	42
7.2. List of operational solar and wind power projects .....	44
7.3. Operational costs per generation technology .....	45
7.4. USD/MXN exchange rate on a one-year period .....	45



## List of Figures

Figure 1. Electrical control regions .....	9
Figure 2. The Mexican energy mix .....	9
Figure 3. Installed generation capacity (2018) .....	10
Figure 4: Planned renewable generation capacity additions over the 2018-2032 period .....	12
Figure 5. Mexico's energy mix targets (2018-2032).....	12
Figure 6. Planned capacity retirements for the 2018-2032 period .....	13
Figure 7. Transmission regions .....	14
Figure 8. Cross-border interconnections .....	15
Figure 9. Control regions and energy consumption (TWh, 2016).....	16
Figure 10. SEN total demand (TWh) .....	16
Figure 11. Evolution of distribution energy losses (2002-2022).....	18
Figure 12. The Mexican power supply chain .....	21
Figure 13. Pre and post-reform structure of the electricity market.....	22
Figure 14: Mexican wholesale electricity market .....	27
Figure 15. Estimated investment per activity (2018-2032, billion USD).....	28
Figure 16: Map of Mexico's electricity network .....	37
Figure 17: Average LMP by region (2016).....	38
Figure 18: Daily Average Local Marginal Price (2018) .....	38
Figure 19: Daily Local Marginal Price spread (2018).....	39

## List of Tables

Table 1. CFE subsidiaries and affiliate companies .....	7
Table 2. Governmental bodies related to the electricity sector.....	8
Table 3. Installed Generation Capacity (MW).....	10
Table 4. Generated energy (GWh).....	11
Table 5. Energy generation share by participant type and modality (2018) .....	11
Table 6. Renewable energy potential in Mexico.....	12
Table 7. Peak load (MW).....	16
Table 8. Energy losses on the national level.....	18
Table 9. Distribution grid reliability indices .....	18
Table 10. Previous and awaited reliability goals.....	19
Table 11. Electricity tariff categories .....	20
Table 12. Electricity tariffs .....	20
Table 13. Maximal and minimal recorded LMPs for 2016 & 2017 .....	25
Table 14. Mexican long-term electricity auction phases and requirements .....	26
Table 15. Mexican entities' efforts to deploy storage: obstacles and benefits .....	34