

C5 Electricity markets and regulation

PS2 - Changes to Markets and Regulation to Enhance Reliability and Resilience

Paper ID_10750

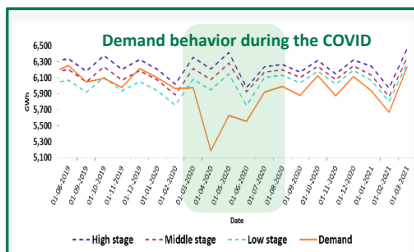
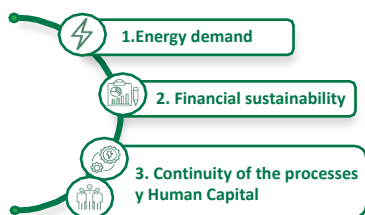


CHALLENGES FOR THE COLOMBIAN ELECTRICITY MARKET DURING COVID-19

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XM S.A. E.S.P.

Main impacts of COVID on the Colombian electricity market



How was the market prepared to face a crisis?

| Technological infrastructure | Good practices |
|--|---|
| <ul style="list-style-type: none"> ✓ Cybersecurity ✓ Communications ✓ Remote access ✓ Process virtuality – Telecommuting ✓ Virtual banking transactions ✓ Reliability-Backup | <ul style="list-style-type: none"> ✓ Business continuity plan ✓ Risk management scheme: <ul style="list-style-type: none"> • Risk Committee • Crisis Committee |

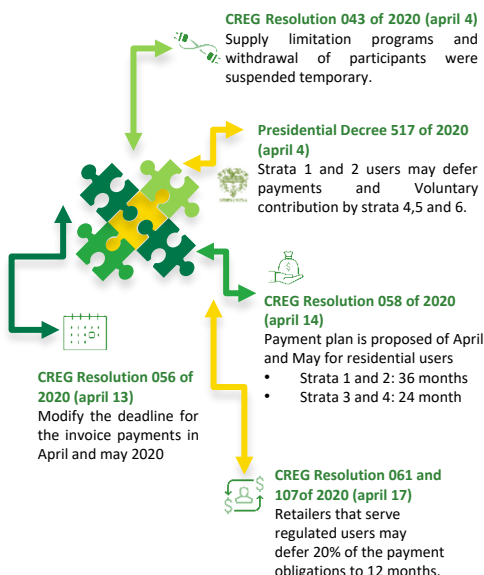
Crisis management

| | |
|--------------------------|---|
| <p>Health</p> | <ul style="list-style-type: none"> • Protection and prevention actions • bio-security standards • Displacement • Lockdown |
| <p>Adaptation</p> | <ul style="list-style-type: none"> • Critical Charges/Backup • Teleworking • accesses and remote management |
| <p>Continuity</p> | <ul style="list-style-type: none"> • Training • Shifts • Retain employees • Supplier management |

Continuity service of electricity supply

| | |
|--|---|
| | <p>Follow-up and monitoring :</p> <p>MME, SSPD, CREG, XM Payment indicators users, financial performance of agents, systemic risk, critical scenarios</p> |
| | <p>Regulation:</p> <p>New and temporary regulations for the emergency period, making the regulations of the sector more flexible</p> |
| | <p>Scenario Analysis:</p> <p>Impact Analysis, Regulation of tariff, Retailers Income</p> |

Implemented actions by Market Regulator and National Government



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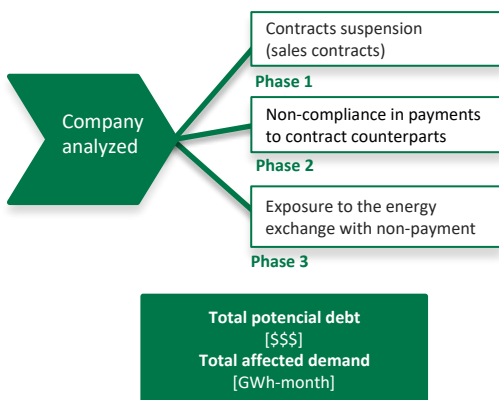
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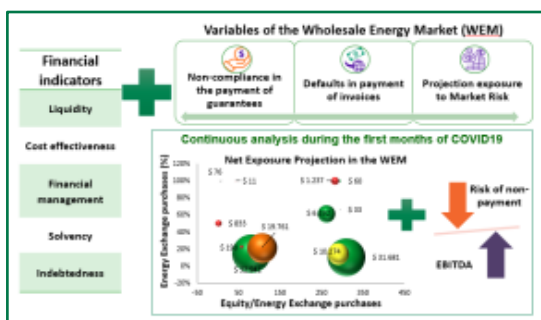
Model implemented to monitor the market during the crisis

The model allows the market to give early signals regarding possible effects on the market, estimating the possible financial impact of systemic risk and affected demand.



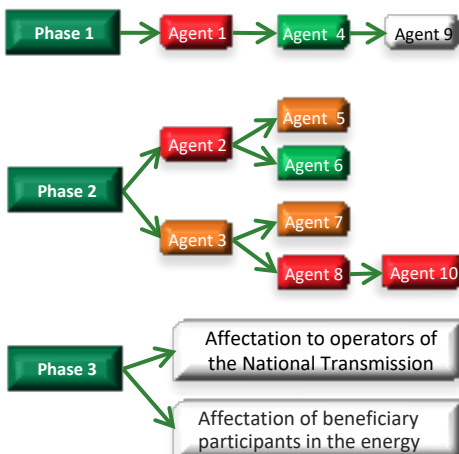
Net Exposure Projection in the Wholesale Energy Market

A Scoring type model is implemented, where the impact of the agent in the market is measured by its exposure to purchases on the energy exchange and the riskiest agents (high default probability) are classified by color with the information of the financial indicators and defaults in the market.



The effects on other agents are identified and the entire model is run again, considering the new effects in order to identify new agents that may be giving negative signals and again notice how do they affect their counterparts. Once the model identifies all the counterparties that may be affected by the cause of the initially identified agents, the total of the potential debt, the total of the possible affected demand and a map of the identified domino effect are calculated.

Domino effect



Domino Effect in the Wholesale Market



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User payment behavior during the critical months of COVID

Follow-up and monitoring of Superintendence of Public and Residential Services - SSPD to assess the level of payments of end users and its evolution, to assess the measures implemented and assess the need for new actions.

| Month (2020) | Payout percentage (Users) |
|--------------|---------------------------|
| February | 96% |
| March | 85% |
| April | 79% |
| May | 94% |
| June | 82% |
| July | 90% |

Results of the model before and after the crisis period

There are not significant changes in the financial risk level for the Wholesale Energy Market

| High Risk | Medium Risk | Moderate Risk | Low Risk |
|-----------|-------------|---------------|----------|
| 0.8% | -5.7% | 16.7% | -5.9% |

* 120 participants evaluated in 2020 and 113 participants evaluated in 2019

Payout level in the Wholesale Energy Market

There was a high level of payments and the impact on the market was not as great as expected, there were no outages to users, there was no impact on the companies participating in the sector and the debts that left the market during 2020 was only 0.003% of the managed amounts.

| Month (2020) | Payout percentage (WEM) |
|--------------|-------------------------|
| January | 100% |
| February | 100% |
| March | 100% |
| April | 99% |
| May | 99% |
| June | 99% |
| July | 100% |
| August | 100% |
| September | 100% |
| October | 100% |
| November | 100% |
| December | 100% |

Five (5) retailers were withdrawn from the Wholesale Energy Market, two (2) already presented negative signals in the market before COVID and the other three (3) were agents who had not traded in the market for a year.

Conclusion

- ✓ The Colombian electricity sector has strengths and good practices that have allowed it to face the emergency of COVID-19, using practices such as continuity plans, risk management, technological infrastructure and its resilience.
- ✓ The actions that have been implemented have worked, and it shows us that proactive actions reduce the impact of these scenarios. These actions have been implemented from the regulation and in the internal processes of the companies.
- ✓ There is no doubt that this situation brings with it important challenges and opportunities for the market in all areas, such as better preparation to face crises by anticipation, monitoring, systemic risk analysis and extreme scenarios.
- ✓ The pandemic left a very positive impact for the sector in terms of digital transformation, a challenge that was being worked on and whose progress was accelerated by the crisis, reducing time to achieve the sector's objectives in this regard.
- ✓ There were no significant impacts on the financial sustainability of the Wholesale Energy Market after the crisis, and it was possible to guarantee the supply of energy to all users in the country.