# Risk management tool

## 1. Introduction

In order to provide retailers with an understanding of their financial resilience in adverse market conditions, EMA has developed a risk management tool in collaboration with Sapere Research Group. The tool measures different financial ratios to provide an indication of the retailer's financial resilience, in each of 6 potential scenarios.

## 2. Description of scenarios

Table 1 shows the summary of the parameters for the 6 potential scenarios. Each scenario comprises of a price-duration pair and seeks to model an extreme but plausible event that retailers may face. Examples include generation plant failures resulting from natural events, engineering failures or cyber-attacks.

**Table 1 Summary table of scenario parameters**

| | $S_1$ | $S_2$ | $S_3$ | $S_4$ | $S_5$ | $S_6$ | Units |
|---|---|---|---|---|---|---|---|
| **Scenario energy price ($P_i$)** | $4,500 | $1,000 | $455 | $254 | $254 | $10 | $/MWh |
| **Scenario duration ($X_i$)** | 10 | 24 | 96 | 360 | 720 | 360 | Duration in hours |

The illustrative descriptions for the 6 potential scenarios are as follows:

**Scenario 1 ($S_1$) a short and sharp critical asset failure**

In this scenario, the market is caught unprepared by a dramatic shock such as a critical asset failure. The duration is short and the price reaches the maximum price cap.

**Scenario 2 ($S_2$) a 24 hour critical asset failure**

In this scenario, the critical asset failure is sustained for 24 hours. An open cycle gas turbine (OCGT) or equivalent sets extreme high prices for 24 hours while the failure is addressed.

**Scenario 3 ($S_3$) a critical asset failure sustained for 4 days**

In this scenario, the critical asset failure cannot be fixed overnight and lasts for 4 days. Alternative supply is available and average prices are high at $455.

**Scenario 4 ($S_4$) a sustained critical asset failure**

In this scenario, a failure of critical assets takes an extended period to repair. An example might be the unplanned loss of 20-30% of gas supply for up to 15 days. Average prices are moderately high.

**Scenario 5 ($S_5$) an extended critical asset failure**

In this scenario, average prices are moderately high for a month before normal market conditions are restored.

**Scenario 6 ($S_6$) a price collapse**

In this scenario, extreme low prices last for 15 days before normal conditions are restored.

## 3. Description of inputs

The key inputs required for the risk management tool (cells D8-D16 of the spreadsheet) are:

- Expected annual net cash flow from operations (NCFO): Excludes earnings not directly related to business activity such as interest, taxes, depreciation and changes to working capital
- Equity (or equivalent)
- Arrears: Past experiences indicate that retailers with high arrears face increased financial pressure in adverse market conditions
- Expected annual sales: Shows the volume of energy expected to be purchased from the market
- Current hedge volume and weighted average hedge price
- Credit support, prepayment amount and working capital

These inputs are required to assess the financial implications of the various scenarios on the retailer.

## 4. Interpretation of the financial ratios

The ratios compare the financial impact on the retailer's annual performance for each scenario, with the expected annual performance in the absence of the scenarios. The ratios provide an indication of the retailer's financial resilience by calculating the change in NCFO and the additional margin call requirements that result from each scenario as follows:

- Change in NCFO / annual NCFO
- Change in NCFO + receivables in arrears / annual NCFO
- Change in NCFO / equity
- Change in NCFO + receivables in arrears / equity
- Margin call[1] / working capital

Table 2 details the interpretation of the ratios.

**Table 2 A guide to the implications of ratios that result from the tests**

| Ratio | Implication |
|---|---|
| **Greater than 0** | The retailer would benefit in the scenario where the ratio is above 0. |
| **-1 to 0 (inclusive)** | Where the ratio is negative but greater than -1 the retailer is financially exposed relative to annual NCFO or equity in the event of the scenario occurring once in a year. This case would not necessarily be critical because annual NCFO or equity would still be positive. |
| **Less than -1** | A ratio of less than -1 indicates a retailer is vulnerable if the scenario was to occur. In this case the retailer stands to lose all of their annual NCFO and more, or more than their equity in the scenario. |
| **Margin call relative to working capital** | The significance of the proportion of margin call to working capital will depend on the individual circumstances of each retailer. |

[1] The margin call calculation for the estimated scenario net exposure is based on the overall scenario price impact up to a maximum period of 20 calendar days (in line with EMC's settlement period).