

The logo for Moody's, featuring the word "MOODY'S" in a blue, serif font. The background of the slide is a low-angle shot of a modern glass skyscraper against a clear blue sky, with a dark blue horizontal band across the middle.





MOODY'S

Cyber Risk to Financial Stability

December 2020

Cyber risk and ratings methodology

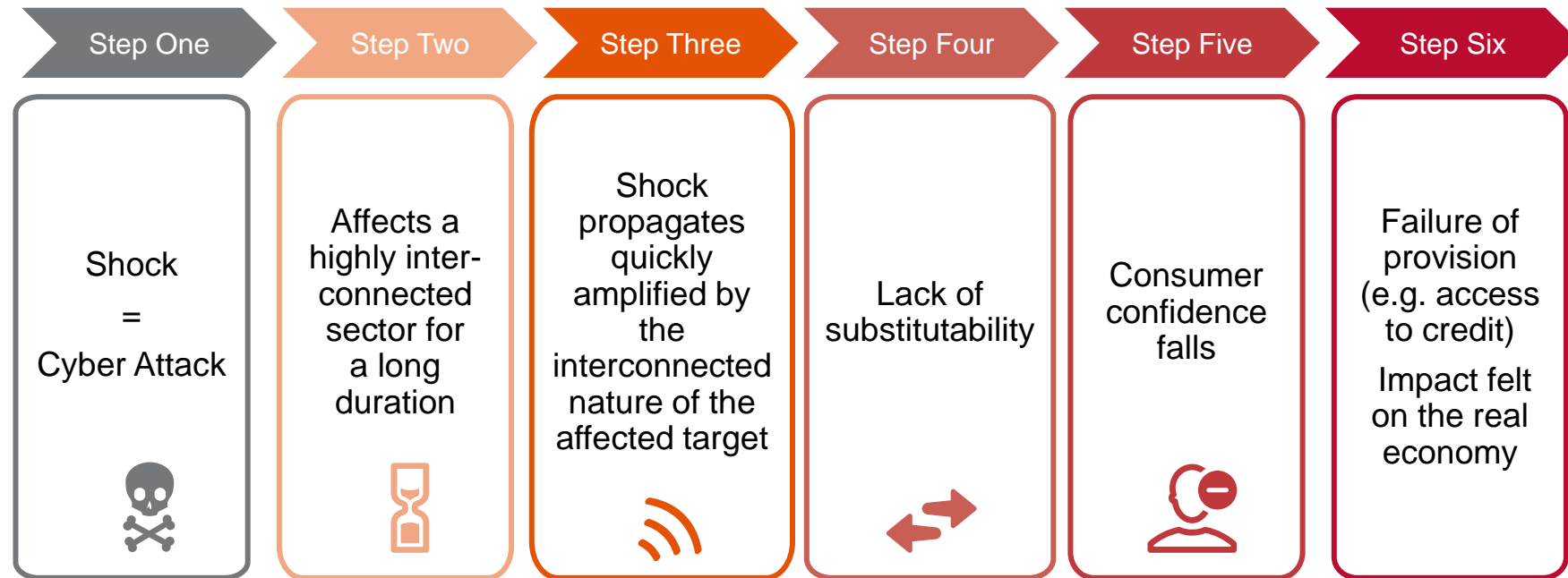
How a cyber event could impact a sovereign's credit profile

Ratings Methodology Factor Scores				
<i>Sovereign</i>	<i>Governments (RLGs)</i>		<i>Hypothetical cyber event</i>	<i>Credit impact</i>
<i>Economic strength</i>	<i>Economic fundamentals</i>		An attack on critical infrastructure could disrupt economic activity, or an attack could be perpetrated on a smaller, less diverse government that relies on a single industry as a source of growth.	Economic growth could slow significantly and economic strength could be impaired.
<i>Institutions & governance strength</i>	<i>Governance & management</i>		A cyberattack could expose sensitive information that reveals institutional arrangements that are weaker than previously thought.	Our assessment of institutional effectiveness and quality of governance could decline materially.
<i>Fiscal strength</i>	<i>Financial performance & debt portfolio</i>		While rare, fiscal costs associated with a cyberattack could be so large that they result in weaker overall fiscal strength for sovereigns, or weaker financial performance and debt profiles for RLGs.	Financial resources and fiscal strength could decline.
<i>Susceptibility to event risk (Political risk)</i>	NA		A cyberattack could attempt to disrupt domestic or geopolitics, including through direct or indirect election interference.	Political risk could rise.

Source: Moody's Investors Service

Factor 1: Economic strength

Example of how a number of conditions would need to be met for an attack to impact the economy:



Source: Bank of England

- Economy's size and diversity can reduce the impact.
- Duration of the attack is key, as well as interconnectivity of the targeted infrastructure.
- Risk is higher for small local and regional governments.

Survey provides consistency

1

Survey designed to raise analytical expertise

Primary objective is to raise analyst knowledge, to help engage issuers in better discussion of risk – in turn, this increases value of analyst opinion to capital markets

2

Research based on anonymized and aggregated survey results is the #1 thing issuers ask us when we raise the survey

First “insight” publication in Q4 2020 – Project and Infrastructure Finance, followed by Financial Institutions Group, Corporate Finance Group sub-sectors, and the Public Finance Group

3

Best Practices!

Reminder → Analysts are obligated to request and gather data and information that we deem important to getting the rating right!

Cyber Risk Insight Continues to Develop



February 2019

Cybersecurity Heat Map

In this report, we assess the inherent cyber risk exposure of 35 broad sectors. We determined that infrastructure debt issuers have medium-high exposure to cyber risk, mostly because of the high vulnerability of electric utilities to cyberattacks.

Cross-Sector - Global

[“Credit implications of cyber risk will hinge on business disruptions, reputational effects”](#)



November 2020

Cyber Risk of PPIF

We conducted our inaugural cyber risk survey of infrastructure issuers to gauge cybersecurity preparedness among infrastructure issuers

Survey Questionnaire



Governance



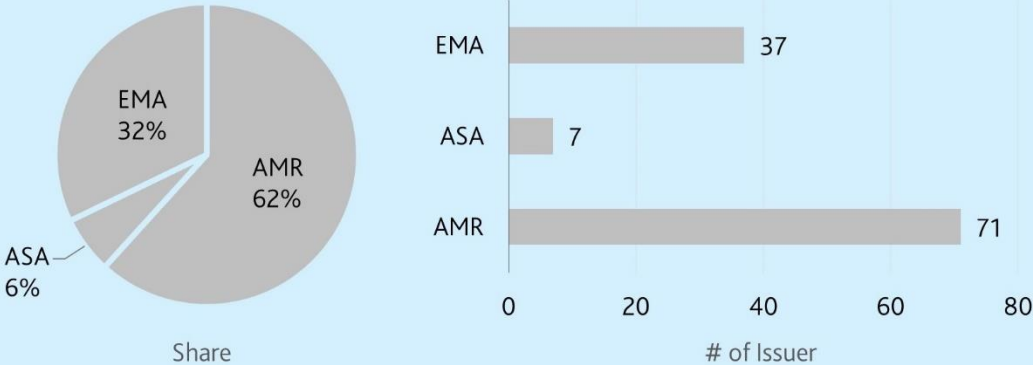
Management



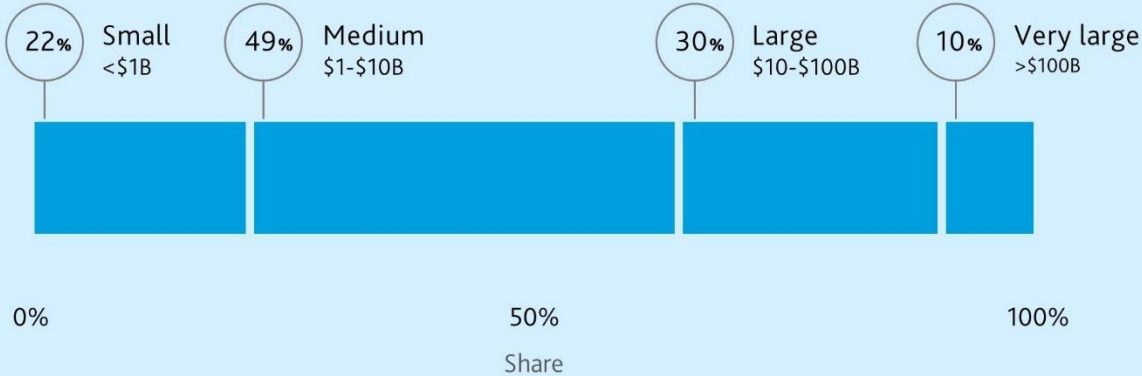
Transfer

Cybersecurity Survey – Global Electric Utilities

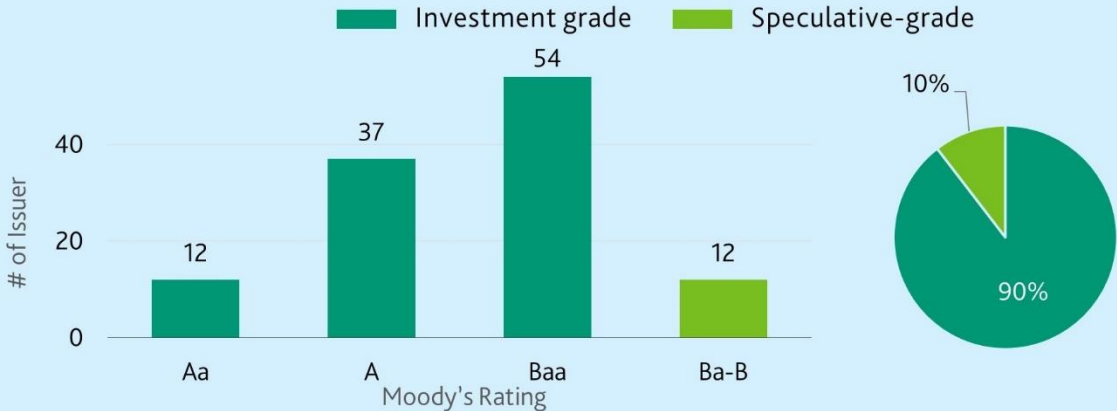
Survey Group by region



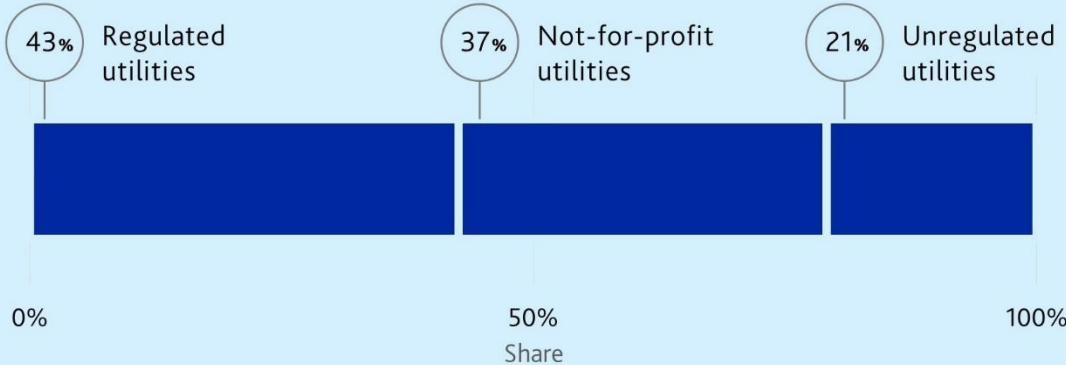
Survey Group by size



Survey Group by rating



Survey Group by sector

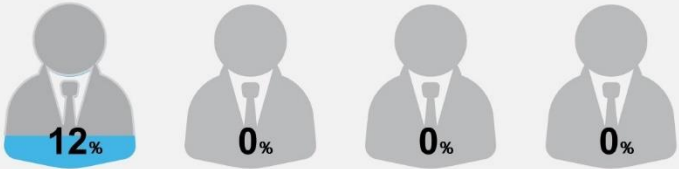


Greater financial resources give very large utilities an edge over smaller counterparts

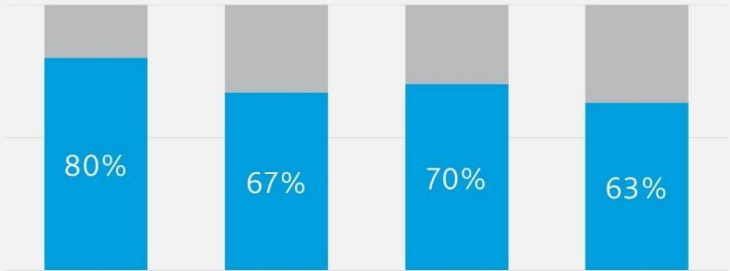
Governance

Cybersecurity reporting & background

Board of directors has at least one with cyber expertise



Very large ≥\$100B Large ≥\$10-\$100B Medium ≥\$1-\$10B Small <\$1B



One-level reporting directly to C-suite

Management

Cybersecurity resilience

% that completed tabletop simulation last 12 months



Very large ≥\$100B Large ≥\$10B-\$100B Medium ≥\$1B-\$10B Small <\$1B



% that completed red team testing last 12 months

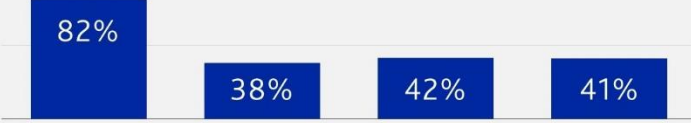
Supply chain management & Insurance

Cyber Risk Assessments of Current Vendors

Very large ≥\$100B Large ≥\$10B-\$100B Medium ≥\$1B-\$10B Small <\$1B



Cyber Risk Assessments of New Vendors



% with explicit cyber coverage through insurance policy



State-owned utilities use of cyber defense tools lags that of their privately owned counterparts



Management

Cybersecurity resilience

% that have completed a tabletop simulation in last 12 months

% that require cyber risk assessments of M&A targets

% of online applications subject to a penetration test in the last 12 months

% that have completed red team testing in the last 12 months

% that have a formalized process to address issues found during red team testing

Supply chain

% that require cyber risk assessments of new vendors

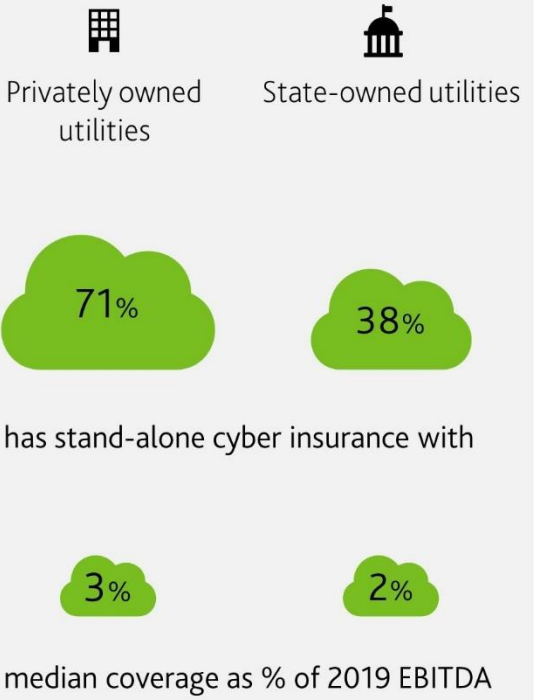
% that require periodic cyber risk assessments of current vendors

% that receive timely notification of incidents and vulnerabilities that affect vendors



Transfer

Insurance



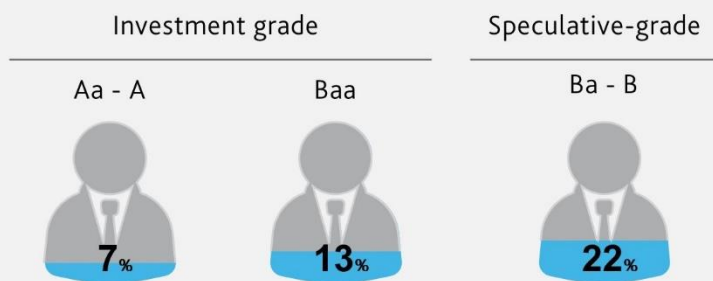
Rating levels and regional differences are not major distinguishing factors



Governance

Cybersecurity experience

Board of directors has at least one with cyber expertise



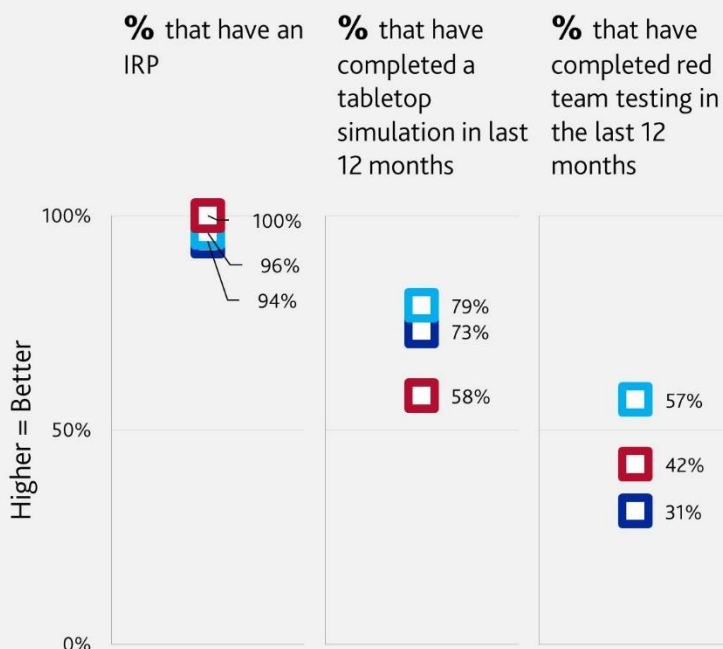
Cybersecurity-related compensation



Management

Cybersecurity resilience

- Investment grade: Aa/A
- Investment grade: Baa
- Speculative-grade: Ba-B



Transfer

% with stand-alone cyber insurance



Timely notification of cybersecurity



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