ICICI Lombard
Nibhaye Vaade

CORPORATE INDIA RISK INDEX

2022

Intelligence partner FROST & SULLIVAN

SECTOR REPORT 2022

ENERGY


RISK

Table of Contents

Preface....2
Executive Summary....3
1. Introduction....4
2. Bottom-Up Risk Assessment Approach....9
3. Defining the Risk Scale....10
4. India - Emerging Superpower with Optimized Corporate Risk Handling....12
5. India Showcasing an Optimized Risk Handling....14
6. Energy Sector Insights 2022....16
7. Energy Sector Risk Index 2022 Vs 2021....18
8. Key Highlights....19
9. ICICI LOMBARD: Key Solution Offerings....29
Bibliography....32

Table of Figures

Figure 1: India's Growth of manufacturing exports. 12
Figure 2: Corporate India Risk Index 2022 14
Figure 3: Corporate India Risk Index 2022 Sector Score 15
Figure 4: Detailed Comparative Analysis 2021 Vs. 2022 18

Preface

Corporate India Risk Index is primarily an academic exercise to understand the level of risk that companies are facing and also assist in developing a successful risk aversion plan, CIRI is a first-of-its-kind risk measurement tool to gauge the level of a company's risk exposure and preparedness.

This Corporate risk comprises of various aspects of the business–spanning customer, competition, regulatory environment, business operations, technology finances, environmental factors etc. The impact of unprecedented events is significantly higher now.

This Index is a comprehensive framework that draws upon global risk management best practices and comprises of 32 risk elements across 6 broad dimensions. The Risk Index is based on the principles of Lean and Six Sigma that qualify business processes by measuring effectiveness and efficiency.

ICICI Lombard's Corporate India Risk Index provides a crucial tool for assessing and addressing risks, fostering resilience and adaptability in the ever-evolving global landscape. In the current climate of increasing macroeconomic uncertainties, it is essential for corporates to prioritize robust risk management. We believe that a proactive approach to risk management not only fortifies individual businesses but also contributes significantly to India's overall economic growth and stability.

Executive Summary

The energy sector is a large and all-encompassing term that describes a complex and interrelated network of companies, directly and indirectly involved in the production and distribution of energy needed to power the economy and facilitate the means of production and transportation. The risk exposure, risk management and risk index of the energy sector was determined.

The overall Risk Index for energy sector was improved whereas the risk management and exposure was increased. Index was based Due to factors like Inflation, Taxation and Regulatory Risks faced major disruption due to the fuel price hike and post Covid era effects. External macro-economic factors like geopolitical tensions, global rise in inflation and reduced industrial activities led to the difference in the risk exposure.

Indian power sector is undergoing a significant change that has re
industry's future in India is bright, and sustained economic grow
in India with given importance to the effective management of a

Introduction

ICICI Lombard Corporate India Risk Index is a one of its kind, unified, credible, standardized corporate Risk Index that spans over the country level, the industry level, and the company level. The index has a comprehensive sector coverage.

Aerospace and Defense, Agriculture and Food Processing, Automotive and Ancillary, BFSI, Biotech & Life sciences, Chemicals and Petrochemicals, Education Skill Development, Energy, FMCG, Healthcare Delivery, Infra and Realty, IT/ITES, Manufacturing, Media and Gaming, Metals and Mining, New Age & Startup, Pharmaceuticals, Telecom and Communication Technology, Tourism and Hospitality, Transportation and Logistics.

The impact is identified across key business risk (internal and external) under the following 'Strategic Risk Areas', The ICICI Lombard Corporate India Risk Index Framework comprises of 32 risk elements across 6 broad dimensions.

Market and Economic Risk

Corporate Risks arising due to market and economy related factors, such as internal or external political uncertainty, global slowdown, taxation-regulatory changes etc. Market and economy related risks are also identified as 'Systematic Risks', we have further classified the risks into below mentioned categories.

- **Inflation:** Inflation is the general increase in prices within the economy. The rising prices for businesses could result in bigger production spending and a fall in profitability. The companies should be attentive, acute, and responsive to changes in inflation to efficiently manage the prices of final products.
- **Taxation:** In a large democracy like India, complexity of multiple taxes (multiple taxes like GST, custom duties, central excise duty, etc.) is a major concern. The changing legislations, increased scrutiny by tax authorities and increasing public attention are together resulting in tax risks for organizations. There is, thus an increasing urgency for firms to manage their tax affairs efficiently to minimize tax risks.
- **Regulatory Risks:** Regulatory risk is the risk of changes in regulations and laws that might affect an industry or businesses. The regulatory changes can pertain to tariffs and trade policies, business laws pertaining to employment, minimum wage laws, financial regulation, Foreign Direct Investment etc.

- **Foreign Exchange Risk:** The exchange rate plays an important role for firms who export goods and import raw materials. The fluctuations in foreign exchange will have great impacts on the prices of traded goods. For example, if the currency depreciates (devaluation), the exporting firms will benefit. However, the firms importing raw materials will face higher costs on imports. The firms need to hedge their exposure to foreign exchange risks to insulate themselves from the impact from forex changes.
- **Geo-political Tension:** Geopolitical risk means the political and economic risks that are a potential threat to the financial and operational stability of companies.
- **Competitive risk:** Competitive risk is the risk associated with the fact that there are multiple companies competing in the market, each seeking to obtain the highest position and consumer ratings, to gain maximum benefits for themselves. The companies devise different strategies to garner a higher market share and acquire customers from competitors. Any failure in managing the competitive stand could lead to losses in business, thereby making marketing and competition a major risk in market.

Technology Risk

Technology risks are also identified as information technology related risks which may arise due to failure of any installed hardware or software system, spam, viruses or any malicious attack. Also delay/over/under adoption of trending disruptive technologies can lead to technology related risks. We have classified the risks in below mentioned categories.

- **Innovation Risk / Obsolete Technology**: Innovation is the key to success in all the industries. Risk of redundancy and losing out to competition on account of poor R&D is a major concern.
- **Intellectual Property risk:** Dependence on trade secrets and unpatented proprietary know-how.
- **Disruptive Technologies:** These will fundamentally alter the financial prospects of the industry.

Data Compromise: Hardware failure refers to malfunctions within the electronic circuits or electromechanical components (disks, tapes) of a computer system; Software failure refers to an operating system crash. Such failures lead to stoppage of entire computer or operating systems creating substantial losses to business.

Operational and Physical Risk

Risk of losses caused due to faulty or failed processes, systems or human resource related inefficiencies are classified as operational and physical risks. We have classified Operational & Physical risks in below mentioned categories.

- **Critical Infrastructure Failure / Machine Breakdown:** Industries with a heavy dependence on machinery consider any rise in machinery breakdowns a hindrance to their businesses operations. An untimely equipment breakdown can bring businesses to a standstill or be the root cause for fires and explosions. Mostly, human errors and deferred maintenances are the major reasons for such breakdowns. The companies should actively invest in timely maintenance of all machineries.
- **Business Continuity / Sustainability:** Non adoption of Business Continuity/ Sustainability Plans and Lack of Internal Control tools would result in: Failure of businesses, Brand Equity / Loss of reputation, Financial Loss, Business model Failure, Ineffective engagement/communication with stakeholders, Losses in productivity, Lack of opportunity monitoring.
- **Supply chain risk:** Raw Material unavailability and Heavy Dependence on Global Supply Chains / Supplier concentration risk. Unavailability of raw materials owing to disruption in the supply chain or heavy dependency on one source (company/country) which is unable to supply owing to some geo-political tensions, fires, or any other incidents. Transportation is one of the key activities for companies making it an important risk to mitigate. The loss of goods in transit and spillage is one of the major concerns as it accounts for a sizeable loss of revenue to companies.
- **Commodity Price Risk - Volatility in prices of raw materials:** The fluctuations in raw material prices creating a margin pressure / top-line pressure in the scenario of rising input costs.
- **Portfolio Risk:** Loss of key customers, Customer concentration - Key customers accounting for a larger share of revenue, Over-dependence on suppliers, Business Model Risk: Transformative changes in business model, Tail Risks: Ability to overcome or manage extreme worst-case scenarios.
- **Environmental Hazard Risk:** Any environmental hazard having the potential to affect the surrounding environment.
- **Workplace Accident:** Fire and Explosion Hazards, Containment Incidents, Workplace Injuries
- **Human Resource:** Key person risk: This risk occurs when a business or business unit becomes heavily reliant on a key individual. Talent acquisition and retention - The companies require a highly skilled labor force for R&D as well as continuous production. Accessing skilled resources and expertise on an on-going basis is one of the major challenges; moreover, retention of trained staff is imperative. Labor shortages, Union Strikes & Industrial Actions, Employee health, safety, and security (SHE/Sustainability risk).
- **Financial Risk:** Financial Reporting Risk: Material misstatement of Financial Statements, whether due to fraud or error. Interest rates and equity prices: Interest rate risk arising out of working capital borrowings at variable rates. Equity price fluctuations affect the Company's income or the value of its holdings of financial instruments. Liquidity Risk (Credit Risk / Receivables).
- **Breaches of law (local/ international):** Voluntary/ involuntary breaches of law can lead to costly lawsuits.

Crime & Security Risk

Cybersecurity risks relate to the loss of confidentiality, integrity, or availability of information, data, or information (or control) systems and reflect the potential adverse impacts to organizational operations. These attacks can cause major financial losses, reputational harm, and a loss of client trust. Regarding cybersecurity, the BFSI industry in India has several difficulties, including difficult-to-secure legacy systems, a shortage of qualified cybersecurity personnel, and the requirement for ongoing system and network monitoring. There is a significant investment in cybersecurity tools like network monitoring, endpoint security, access control, and threat intelligence. Many organizations are also implementing cutting-edge technology like artificial intelligence and machine learning to strengthen their security posture. Around 7.4% of the attacks in the Asian region were targeted at India in 2022.

We have classified Crime & Security risks in below mentioned categories.

- **Cyber Crimes:** Data Theft, Spam, scams and phishing, Hacking, Malwares and Viruses, Piracy, Fraud, Corruption, Malicious attacks
- **Counterfeiting:** Counterfeiting of goods/services leads to loss of revenues, profits and ultimately affects the brand equity
- Threat to Women Security
- **Terrorism:** Un-lawful use of violence and intimidation, especially against civilians, in the pursuit of political aims.

Natural Hazard Risk

A natural hazard is the threat of an event that will likely have a negative impact. A natural disaster is the negative impact following an actual occurrence of natural hazard if it significantly harms a community. Due to India's geographical structure, it is one of the most disaster-prone countries in the world. Natural hazards like floods, earthquakes, landslides, and cyclones are common risks faced by India. The situation has worsened due to rise in GHG emissions, loss of biodiversity, deforestation, and degradation of environment. From Surat Gas leak to landslides in the north and cyclones in Bay of Bengal, the year 2022 was no exception. Such natural disasters hamper the day-to-day operations of corporates, and it is important for them to understand that such risks cannot go unheeded. Over the years, Indian corporates have learnt to mitigate such risks by diversifying their supply chains, having multiple logistics partners, diversified geographical presence and multiple vendors.

- **Pandemic and other global epidemic diseases:** Risk to business owing to disruptions caused by COVID-19 pandemic and similar another global epidemic.

Strategic risk

- Strategic risk is the risk that failed business decisions may pose to a company. Strategic risk is often a major factor in determining a company's worth, particularly observable if the company experiences a sharp decline in a short period of time. Several factors, such as unethical or unlawful activities, poor customer service, product recalls, data breaches, or unfavorable media coverage, can lead to strategic risk. An organization's reputation can be severely harmed by a single negative incident, such as a high- profile data breach or fraud scandal, resulting in a loss of clients, income, and market share.

- **Resource scarcity / Misutilization / Overall Utilization:** Difficulties in acquisition of land, water, fuel, or other resources for operations of business.

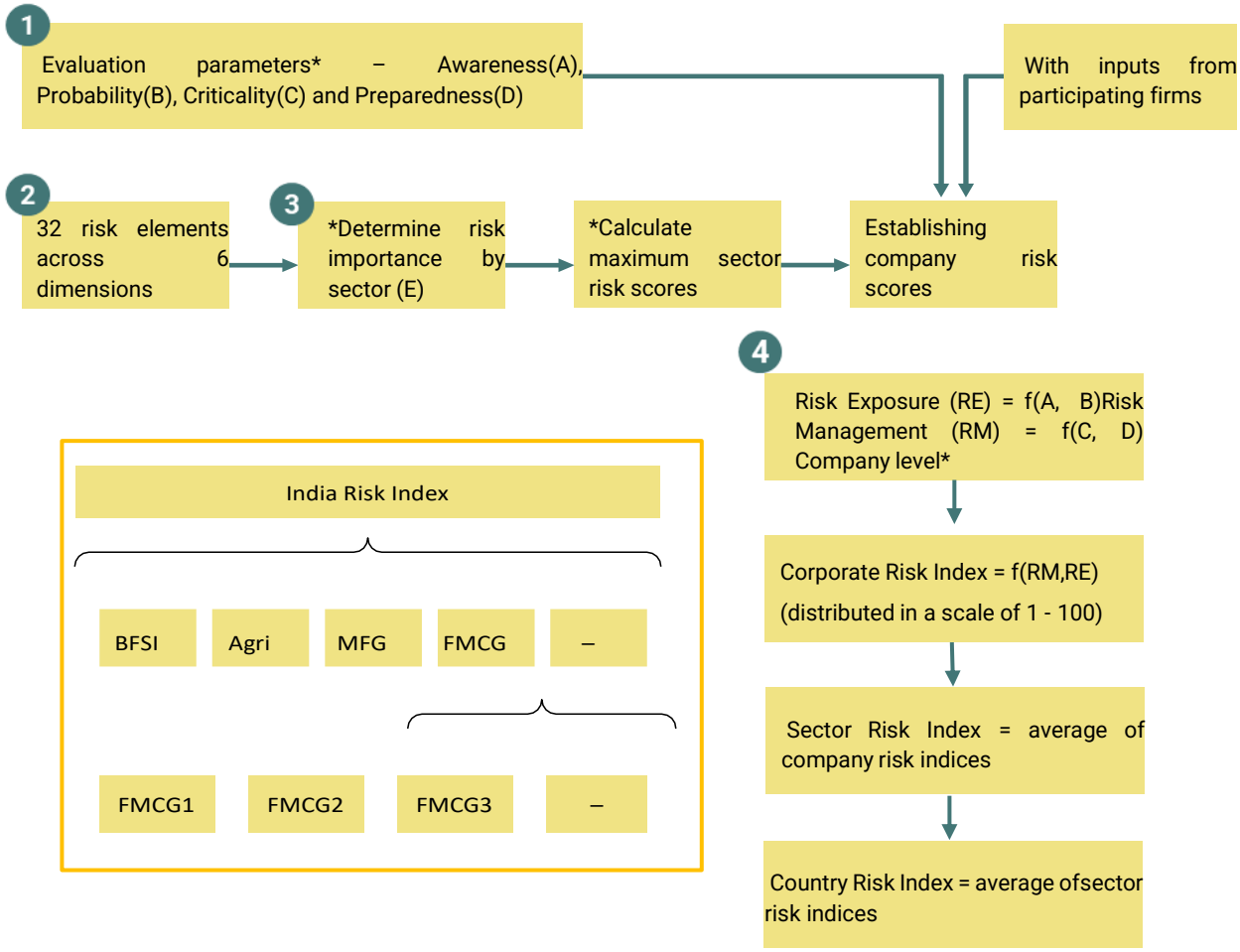
- **Public Sentiment:** Current events playing out in the public scene can change the public sentiment.

- **Delay in execution of projects:** Delays in execution of projects can surge in the capex.

- **Increased number of recalls and quality audits:** Impacts both the brand equity and increased operational expenses.

- **Failed / Hostile Mergers & Acquisitions:** High dependence on inorganic growth.

Bottom-Up Risk Assessment Approach



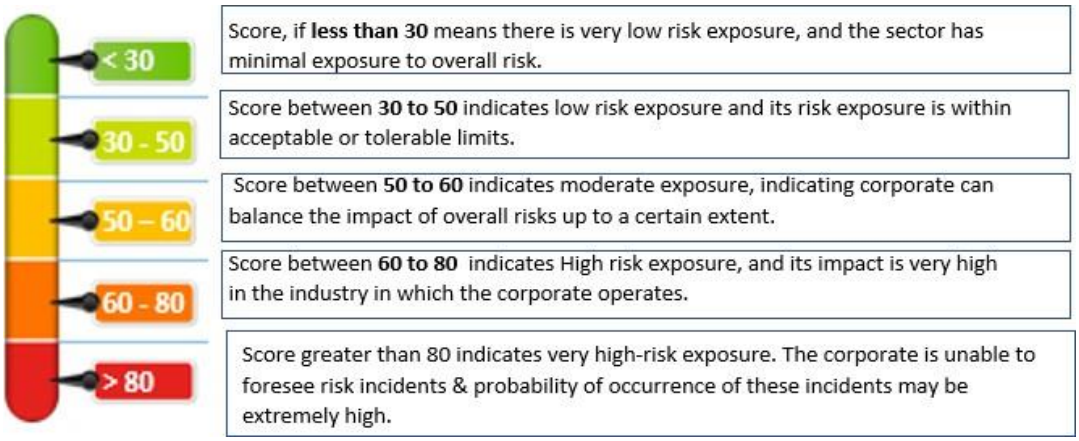
1. **Evaluation Parameters*:** The index maps the risks faced by any enterprise basis of Awareness, Probability, Criticality and Preparedness against the defined Risk elements. The evaluation Parameters are defined as: Awareness - Level of awareness of potential risk affecting the firm. - Likelihood of risk to affect the business goals of the firm adversely. Criticality - Level of impact of the identified risk on the success of business goals. Preparedness - Risk handling practices/ mechanisms already in place to handle the risk.
2. **Determining Risk Importance*:** Importance/Impact of individual risk element is established against individual sector based on the published corporate risk reports, in depth sector understanding by F&S team and SMEs.
3. **Calculating Maximum Sector Risk Score**: Weighted Sum of all risk elements based on their importance to the respective sector.
4. **Company Level*:** All the Risk Index scores for companies in a sector are averaged to represent the sector; and sectors average to India. Risk Exposure is defined as the function of corporate's Risk Awareness and Probability of risk occurrence. Risk Management is defined as the function of an enterprise risk preparedness and criticality risk impact assessment.

Defining the Risk Scale

We have selected 20 sectors to understand the current stand of our country today in terms of risk. Risk for various sectors is measured on the risk exposure scale and risk management scale.

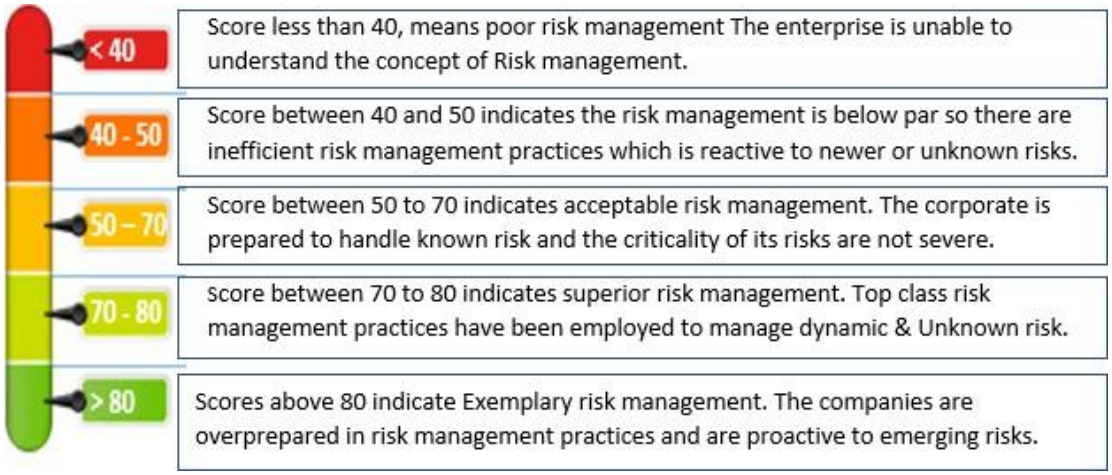
A. ICICI Lombard Corporate Risk Exposure – Scale

Risk Exposure: The impact of any internal, external or strategic occurrence on the financial performance of an organization is defined as the corporate risk exposure. Risk has traditionally been seen as something to be avoided – with the belief that if behavior is risky, it's not something a business should pursue. But the very nature of business is to take risks to attain growth. Risk can be a creator of value and can play a unique role in driving business performance. Let's look at the risk exposure scale.



B. ICICI Lombard Corporate Risk Management – Scale

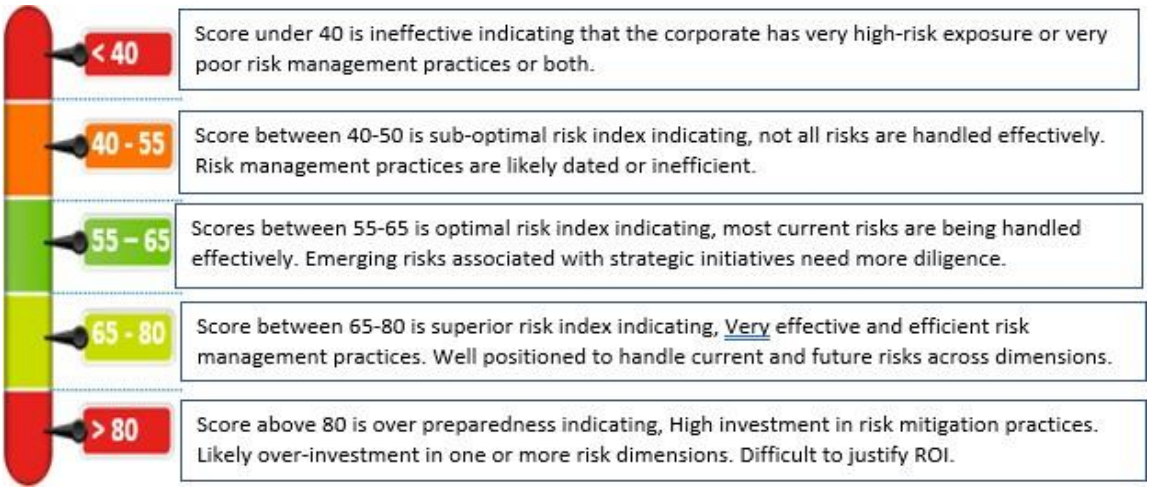
Risk Management: Identification, Evaluation and Prioritization of corporate risks followed by well-coordinated steps to minimize the occurrence of uncertainties in the foreseeable future is defined as the Corporate Risk Management. The risk management scale works in the opposite to that of the risk exposure scale. Let's look at the risk management scale.



C. ICICI Lombard Corporate Risk Index – Scale

Risk Index: Risk Index is a measurement tool to gauge the level of Risk Exposure against Risk Preparedness. The score intends to give companies/Sector/Country access to an extensive and quantifiable metrics of risk management.

Let's look at the risk Index scale.



India - Emerging Superpower with Optimized Corporate Risk Handling

Manufacturing sector contribution to India's GDP in 2022 stands at 17% and is expected to grow to 25% by 2025, the expected growth is attributed to various favorable schemes initiated by Government of India like 'Make in India', 'Digital India', Improved Road Infrastructure, implementation of modern technologies of manufacturing resulting in optimized and effective production, Also the pandemic has made business realize that they cannot just rely on a single manufacturing hub; hence notion of "China+1" is making the world realize the significance of India. China is in a trade war with the USA, which is positively shaping the role India will play in the global arena.

The below chart showcases the gradual increase in India's manufacturing exports.

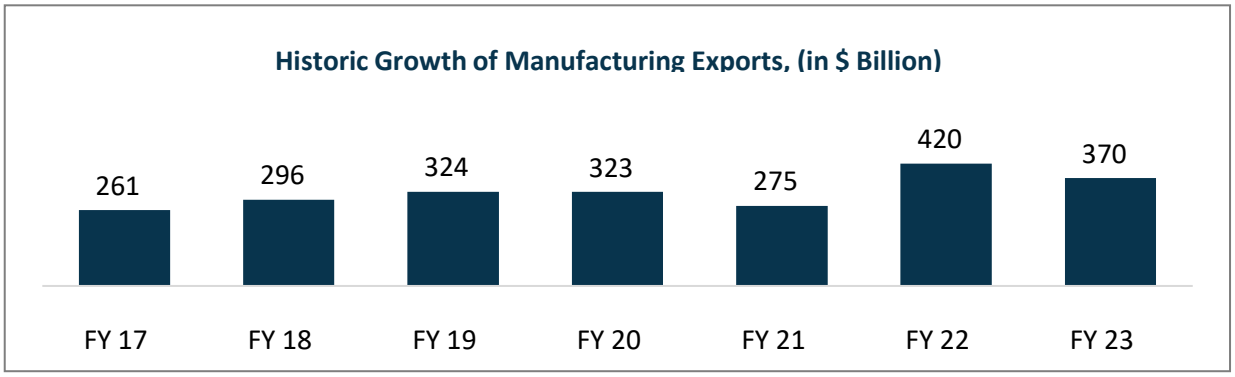


Figure 1: India's Growth of manufacturing exports. (Source: Redseer)

Indian manufacturing sector is also focusing on electronics manufacturing like mobile phones, industrial electronics consumer electronics, etc. due to government initiatives the production has doubled since 2015.

Aerospace and defense sector in India have evolved significantly, Govt. of India have identified A&D as area of focus due to the belligerent neighborhood, steps like Make in India(Atmanirbhar Bharat) is helping the overall defense sector, however India still remains the largest importer of arms and ammunition, favorable policies and ease in regulations is helping the drone industry in India and many new start-ups and big players are entering in this space.

Urbanization is another phenomenon evolving in India and it is estimated that by 2030 more than 400 million people will be living in cities, due to this megatrend huge push towards realty and infra sector is observed which is also the growth of ancillary industries like metals, cement, water availability, sanitation, mobility etc., the government along with the private sector is working on multiple initiatives to manage the huge inflow.

India has observed a steady adoption towards EVs in recent years, though India adoption still remains very low in comparison to Europe, Canada, China, however all big auto players are coming with new lines of EVs, and significant strategic investment have been made. The adoption is primarily due to lower running

costs, lower maintenance, zero tailpipe emissions, tax and financial benefits by the government, convenience of charging.

BFSI sector in India is showcasing a significant robustness in the time of global crisis, there is a growing demand for financial services as there is a gradual rise in income across income brackets, with a rapid increase in mobile penetration and internet availability more than 2100 fintech companies have emerged in India, the traditional banks are also adopting the digital technologies at a required pace, investment on making the systems secured from cyber threats is utmost priority. Policy support by the government in the union budget 2021-22 is taking up shape and is helping the BFSI sector in 2022 and coming years, like government approval of 100% FDI for insurance intermediaries have increased the FDI limit to 74% from 49%.

Healthcare sector is also continuously growing healthcare has become the one of the India's largest employers, employing around 4.7 million people, though in 2021-22 India only spends 2.1% of its GDP in healthcare, in the union budget 2022-23, US$ 11.28 billion was allocated to the Ministry of Health and Family Welfare (MoHFW). there is still huge room for improvement in the overall healthcare system in India. Efforts towards having well trained medical professionals in India is top priority. There were exemplary development in the vaccine manufacturing by India, Bharat Biotech Covaxin and Oxford AstraZeneca's Covishield manufactured by SII, helped India get a protection shield against Covid. There is a plan by the government of India to infuse US $ 6 billion to boost the healthcare infrastructure in India.

The IT/ITes sector is a key engine for fueling India's economic growth and contributing to 7.5% of India's GDP in 2021-22, the Big four IT firms in India have recruited over 1 million employees, As the world is moving towards era of digital economy Indian IT-sector will be contributing significantly towards this journey, the rollout of 5G communication technologies and adoption of new age technologies across industries; like AI, Robotics, Internet of Things will further increase the size of Indian IT sector.

Indian enterprises are also concerned about the risks emerging out of the growing economy and the globalization India is heading towards, its observed that Indian enterprises are taking significant steps towards risk management and keeping budget allocated to implement best in class risk mitigation practices.

India Showcasing an Optimized Risk Handling

Figure 2: Corporate India Risk Index 2022

Corporate Risk Index Score of 63 implies that Indian enterprises are handling the risk in an optimal way but still there is scope of improvement to get into superior risk handling territory, Indian enterprises have a well-defined risk management practice in place for inherent risks, however risk management can be improved further as a potential buffer against potential risk events arising from market & economy, operational and technology related Risk events, openness towards adoption of technology and having a well-defined risk management team was observed across enterprises in India.

Sectorial categorization across above stated five categories, it was found that risk management is getting a paramount importance in the growth strategy of every organization and all the organization fell either into 'Superior Risk Management' or 'Optimal Risk Management' category.

From a risk exposure front the intensity of impact due to market and economy related risks increased due to the heightened inflation, global recession, and geopolitical tensions though from a regulation point the sector specific policies by the government helped the industries. Some of the inherent risks exposure due to the operational aspect did not see a significant change as compared to previous year, however companies are adopting diversification, technologically enabling the supply chain, and creating better hedging against financial related risks, whose results will be seen in coming years.

Below is a broader categorization of sectors in terms of risk index:

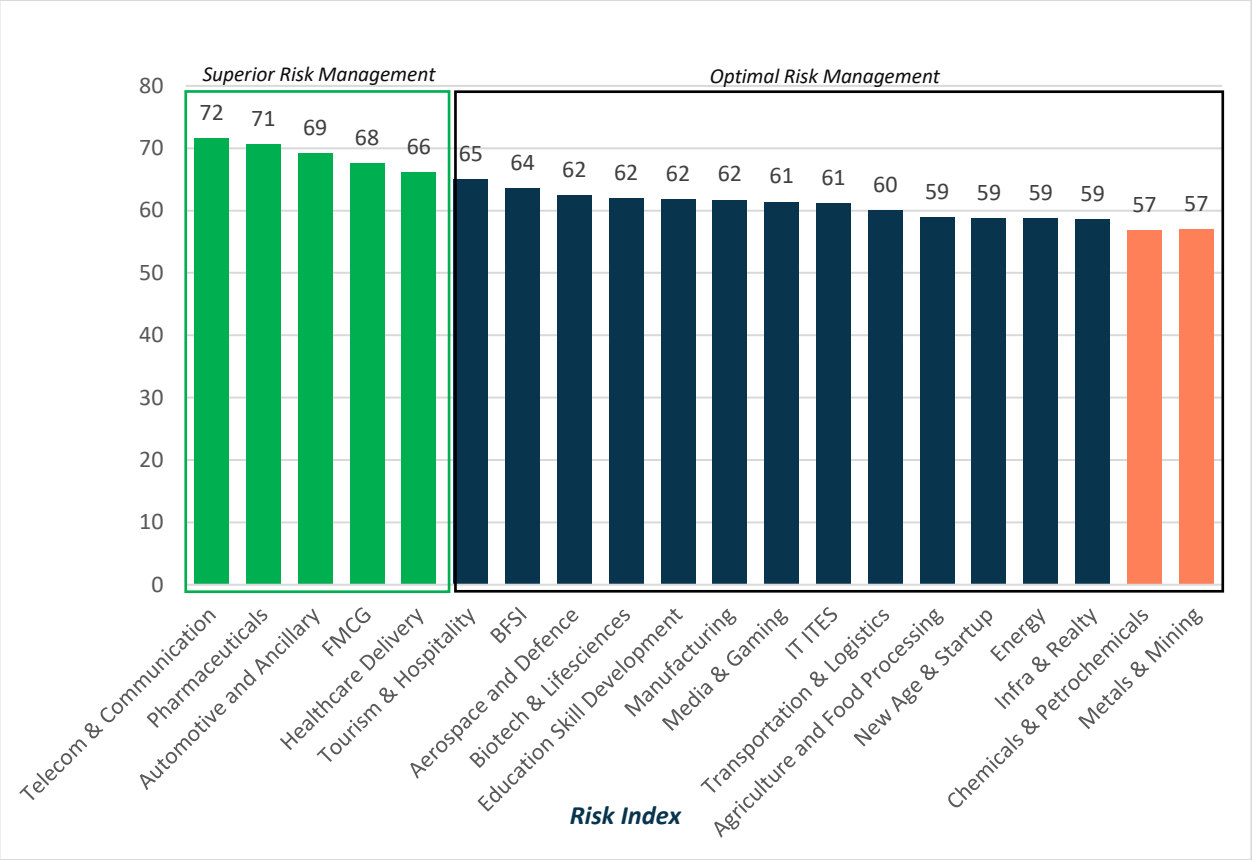


Figure 3: Corporate India Risk Index 2022 Sector Score

Superior Risk Index

Superior risk handling was found in five industrial sectors: Telecom & Communication, Pharmaceuticals, Automotive & Ancillary, FMCG, Healthcare Delivery.

Optimal Risk Index

Optimal risk handling was found in 15 industrial sectors: Tourism & Hospitality, BFSI, Aerospace & Defence, Biotech & Lifesciences, Education Skill Development, Manufacturing, Media and Gaming, IT & ITES, Transportation & Logistics, Agriculture and Food Processing, New Age & Startup, Energy, Infrastructure & Realty, Chemicals & Petrochemicals, Metals & Mining.

Energy Sector Insights 2022

India has a major presence on the world stage. It is currently the world's second-most populous country after the People's Republic of China (hereafter, "China"), and is set to become the most populous in the 2020s. India has been one of the world's fastest-growing economies in recent years, and has become the fifth-largest in nominal terms, behind the United States, China, Japan and Germany. Expressed in terms of purchasing power parity (PPP), which adjusts for Indian buying power relative to other countries, India is the third-largest economy behind China and the United States. However, India continues to be a low-income economy, with a PPP per capita income that is less than half of the world average. With half of India's population under the age of 25, India's economy has the potential to grow very rapidly.

India is characterised by the co-existence of shortage and abundance in several parts of its energy system. India possesses the world's fifth-largest coal reserves, but nonetheless is one of the world's major coal importers. India is a major center for global oil refining, but relies overwhelmingly on imported crude.

While there has been progress on many fronts over these years, the extraordinary disruption caused by the Covid-19 pandemic in 2020 has cast a cloud over the future. To avoid the spread of the virus, the Indian government put in place a series of lockdowns starting in late March 2020, with varying levels of stringency, with the latest estimates showing a contraction in GDP of about 8% in 2020 (IMF, 2021). There was inevitably a considerable impact on energy demand. Full-year estimates see India's primary energy demand falling 5% from 2019 levels, with coal and oil expected to take the largest hit due to far-reaching restrictions on mobility and a reduction in economic activity. Natural gas demand has been resilient, as low prices have offset some of the forces driving down demand. Renewables have also fared relatively well, with generation from wind and solar growing by 15%.

Power is among the most critical components of infrastructure, crucial for the economic growth and welfare of nations. The existence and development of adequate power infrastructure is essential for sustained growth of the Indian economy. Sources of power generation range from conventional sources such as coal, lignite, natural gas, oil, hydro and nuclear power, to viable non-conventional sources such as wind, solar, agricultural and domestic waste. India was ranked fourth in wind power, fifth in solar power and fourth in renewable power installed capacity, as of 2020. 100% FDI allowed in the power sector has boosted FDI inflow in this sector. India's energy firms have made significant progress in the global energy sector.

Today, G20 members account for 87% of the global economy, 75% of world trade and nearly two-thirds of the global population. Coal remains the largest energy source for electricity generation, accounting for 43%, while oil products dominate G20 final energy consumption (39%). But disruptions do occur, particularly under strong pressure from geopolitical (e.g. the 1973 oil embargo), political (e.g. targets for rapid renewable energy deployment), structural (e.g. demographic tipping points) or social factors (e.g. a consensus to retire nuclear plants). Solar photovoltaics (PV), electric mobility, energy storage, and particularly the pervasive adoption of information and communication technologies (IEA, 2017) are among the disruptions on the current horizon.

India, the world's fifth-largest economy, imports nearly 85 per cent of its oil and 45 per cent of its gas requirements every year. In FY22, the country witnessed a 100 per cent increase in its oil import bill to $119 billion on the back of a recovery in global demand and the Russia-Ukraine conflict. As well as affecting countless lives, COVID-19 has unleashed a devastating blow to the global economy, disrupting supply chains while choking off demand. Electricity demand is down significantly in many territories and the market for transport fuel has shrunk dramatically as planes are grounded and movement restricted.

The energy sector was grappling with numerous challenges within its supply chain networks even before recent disruptions driven by the pandemic and the Russian invasion of Ukraine. These disruptions ranging from logistics bottlenecks to shortages of raw materials and components and labor shortages have resulted in rising costs and a scarcity of essential electric supplies. They have also widened the gap between demand and supplies of electrical equipment and components, slowing the clean energy transition. As a result, many electric power and renewable energy companies are revisiting supply chain strategies and rebooting their approach to supply chain risk management. And ripple effects are impacting the broader economy, sometimes slowing new home construction due to a lack of electrical equipment especially distribution transformers and smart meters and delaying transportation electrification.

In conjunction with a rising subsidy level and systemic failure to ensure proper revenue collection along the value chain, the financial capacity of energy sector players is significantly undermined. Lack of sufficient capacity to make timely and adequate investments gives reason to fear that India is heading towards energy crises. Indian energy policy cannot be set in isolation and needs to account for rising global interdependence, while simultaneously communicated appropriately to the public and reflected in policy debates.

Energy Sector Risk Index 2022 Vs 2021

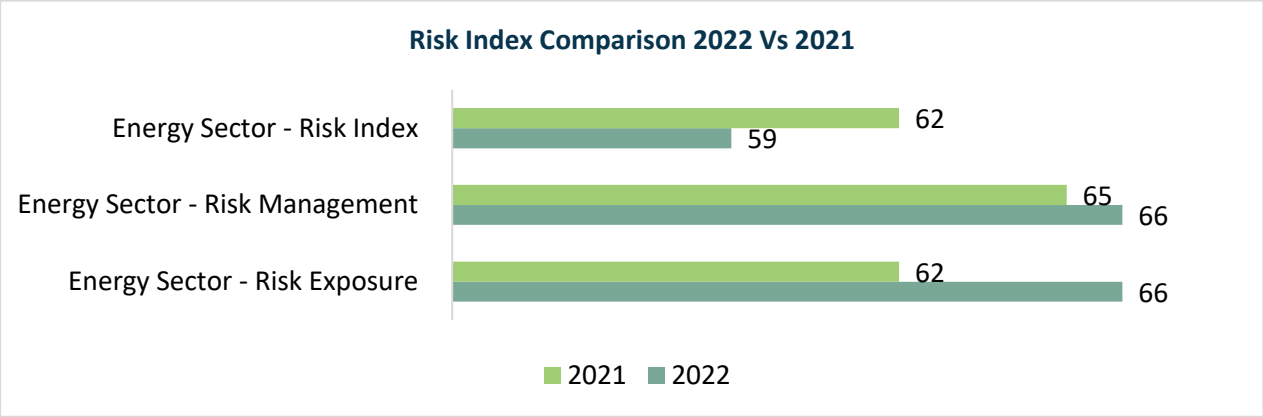


Figure 4: Detailed Comparative Analysis 2021 Vs. 2022

Energy Sector Risk Index 2022 Vs 2021

India Risk Index (Optimal Risk Handling): The overall Risk Index for energy sector improved from 62 to 58 in 2022, this was driven by significant improvement in natural hazard and event risk, crime and security risk and technology risk. The most significant reduction in risk happened due to the reduction in natural hazard risk as 2022 saw the revitalization of business operation in the logistics sector as the economy began recovering from the effects of COVID-19.

There was no significant change in the market and economy risk, operational and physical risk and other risks. This was due to the rising inflation primarily led by the increase in fuel prices and the change in regulations due to the launch of the New Logistics Policy. Operation risk reduced only slightly due to the continued shortage of infrastructure facilities and high risk of worker accidents.

Energy Sector Risk Management 2022 Vs 2021

There was no significant increase in the India Risk Management, however it slightly rose to 66 from 65 in 2022. Factors like Inflation, Taxation and Regulatory Risks faced major disruption due to the fuel price hike and post Covid era effects. A huge dip in the risk management is there due to external macro-economic factors like geopolitical tensions, global rise in inflation and reduced industrial activities.

Energy Sector Risk Exposure 2022 Vs 2021

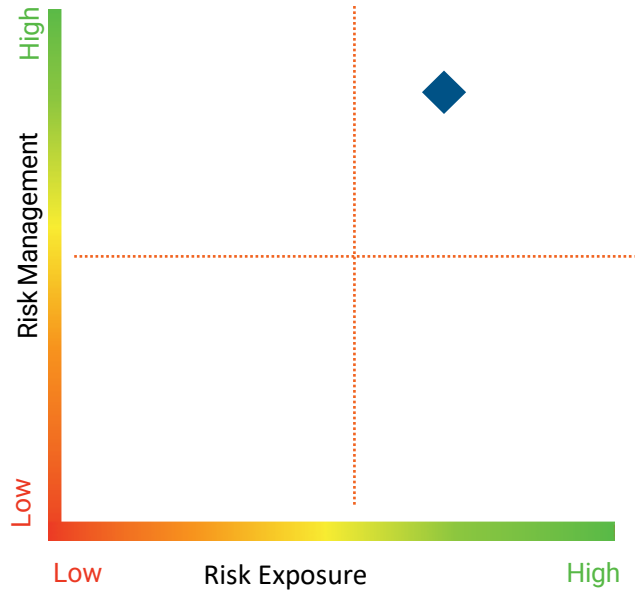
Energy Sector Risk Exposure went up due to heighten geopolitical tensions, global slowdown in GDP growth resulting in reduced industrial activities, all-time low rupee valuation and high CPI inflation. The Risk exposure for Energy Sector went up to 66 vs 62 in 2021. The Market and Economy dimension showed the highest increase in the risk exposure, the major increase is accounted due to the slowed-industrial activities resulting in financial risks and geo-political tensions arising due to the Russia-Ukraine tensions.

Key Highlights

Risk Dimension Analysis: Market and Economy

Risk Exposure Score: 64

Risk Management Score: 67



Inflation

- Fossil fuel related items – transport and household energy, contributed about 20% to India's annual rate of inflation between April and May 2022, according to a report published by Cambridge Econometrics 'Fossil Fuel Prices and Inflation in India'.
- According to the report, between January 2021 and August 2022, fuel and power prices rose nearly five times faster (57%) than overall consumer prices in the country (12%).
- India is one of the fastest growing economies in the world, responsible for over 10% of the increase in total global energy demand and is only expected to grow rapidly over the coming decades
- The strong correlation between energy and inflation in India makes a strong case for India to decarbonise its economy. There definitely is evidence to support the argument that renewable energy can moderate the impact of energy prices on CPI (Consumer Price Index) in the long run.

Taxation

- The energy sector, and in particular, fossil fuels are a significant contributor to the overall revenue of India's central and state governments. This revenue predominantly comes from the petroleum (& natural gas) and coal sectors, which contributed about Rs. 6 lakh crore of the total Rs. 6.5 lakh crore revenue from the energy sector in 2019-20.
- The Centre and states are quite dependent on the energy sector for their taxation revenues, with the Centre's dependence being as high as 25%.
- As part of the central excise regime, the Basic Excise Duty (BED) applies to specified oil and gaseous products.

- The Special Additional Excise Duty (SAED) and the Additional Excise Duty (Road and Infrastructure Cess) additionally apply to gasoline and diesel fuel.
- The Clean Environment Cess applies to coal, lignite and peat consumption.
- Electricity consumption is untaxed at the federal level, with responsibility for the structure and level of taxation lying at the state level.

Regulatory Risks

- India is expected to continue to provide strong regulatory framework with full cost pass through for regulated utilities in its review of tariff framework in 2024 for the next 5- year period.
- High growth and transition capex with leverage of 75:25 will keep the ratio of debt to EBITDA elevated at around 5x for most rated power utilities in India. This is at the upper end of leverage in most of South and Southeast Asia rated utilities.
- To facilitate orderly growth and development of the power sector and also for secure and reliable operation of the grid, adequate margins in transmission system should be created. The transmission capacity would be planned and built to cater to both the redundancy levels and margins keeping in view international standards and practices.

Foreign Exchange Rates

- India is the fourth-largest global energy consumer today, after China, the United States and the European Union, and in the STEPS it overtakes the European Union by 2030 to move up to third position. This is underpinned by a rate of GDP growth that adds the equivalent of another Japan to the world economy by 2040.
- Non-conventional energy sector received FDI inflow of US$ 12.57 billion between April 2000-June 2022.
- Rising foreign investment in the renewable sector (such as the US$ 75 billion investment from the UAE) is expected to promote further investments in the country.

Geo Political Risks

- Under Prime Minister Narendra Modi, the country has announced an ambitious target of achieving 500 GW of renewable energy capacity by 2030 and turning a carbon-neutral country by 2070.
- Like every crisis spawns an opportunity, similarly, the present geopolitical situation presents the country with a unique opportunity to achieve self-reliance, by harnessing its abundant natural resources, both in terms of minerals and manpower. Becoming Atmanirbhar in these metals, especially copper, can be the first in a series of milestones in India's journey towards being a self-reliant global power.

- The Government has displayed its intent of augmenting manufacturing capacities in those industries which are critical for India's clean energy transition. However, the real challenge lies in managing the environmental activism against processing rare earth as was seen in Sterlite Copper, which has remained close for four years now.

Competitive Risk

- The Centre is aiming to bring in consumer choice through new distribution entities to compete against the incumbent monopoly public sector discoms.

- Three-quarters of electricity prices are for power procurement, and not only Inda has a legacy generator power purchase agreement (PPAs), it also has enormous distortions and price variations across generators based on location, vintage, and type.

- Wholesale power markets (through power exchanges) today handle only some five per cent of power. Wholesale competition suffers from the structural distortions, and until we have liquidity in fuel markets and flexibility in PPAs, those with cheaper power will again be those who gain superior fuel and offtake contracts.

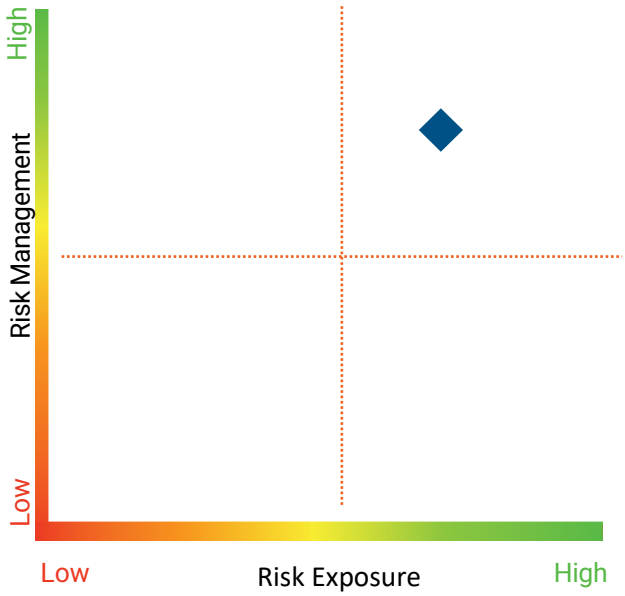
- The challenge is creating a liquid, competitive market with multiple players. Equally challenging, on the retail side, is the fact that a new entrant would want to cherry-pick consumers.

- Aggressive targets such as universal smart metering in three years risk not just failures to scale but the risks of discom unpreparedness (especially for the underlying databases of consumers and assets), high costs, and missing functionality. Smart meters are a powerful tool, but they should be driven by the individual business case per utility, which should drive the design.

Risk Dimension Analysis: Technology

Risk Exposure Score: 62

Risk Management Score: 65



Disruptive Technology

- Technology innovations such as machine learning algorithms and artificial intelligence are entering the power distribution business at a drastic pace. Among other innovations, battery storage and internet of things are showing the promise of transforming the power business in the near future.
- Disruptors such as IoT and energy storage are transforming the electric power sector at a rapid pace; this transformation has led to many traditional power company leaders to rethink and plan for adopting these digital technologies to stay competitive.

- To address the disruptive forces affecting the sector, the energy industry must establish their strategic priorities in four areas.

1. Enable New Revenue Streams
2. Improve Customer Engagement
3. Increase B2B value
4. Innovate to Manage Costs
5. The future of energy is renewable

Intellectual Property

- The Innovation index indicates that approx. 15% of India's high-value patents are related to green tech. In 2013, Indian Patent Office received 1,140 patent applications in the domain of high-value green patents.
- India has an established industry in low-carbon environmental goods and services (LCEGS). It has the third-highest LCEGS sales in Asia (second-highest in terms of proportion of gross domestic product).

- The Indian Patent Office database shows approx. 6000 patent applications published, as of date, in the domain of solar energy, while 10,000 patent applications published in the domain relates to renewable energy covering wind energy, the process for converting hydrostatic pressure into electrical energy, energy generation, hydro wind electric power generation system, solar thermal systems for domestic applications etc.

- A strong IP protection regime encourages business to invest in protection of technology, enter into licensing arrangement and invest in R&D locally. Therefore, the Indian government need to address duty imposed on products that are targeted towards building eco system for renewal products manufacturing.

Data Compromise

- Over the last few years, the energy sector is found to be highly susceptible to ransomware attacks. A ransomware attack could cause panic, if not a real shortage of fuel supplies.

- Some of the ransomware is now capable of lateral movement and digging deeper into the victims' networks to identify critical data and fend for ways and means to increase monetization.

- Ransomware has emerged as a prominent cyber risk for the energy sector as well. In recent times, ransomware attacks have targeted big entities, improved their extortion techniques, and their consequences are far reaching, well beyond the immediate victim(s).

- The ongoing geopolitical conflict between Russia and Ukraine has already sent fuel prices skyrocketing in almost every part of the world. The conflict itself calls for a heightened state of preparedness in the face of escalating cyber offensive between Russia and Ukraine, more so for the energy sector.

Counterfeiting

- Counterfeit goods are no longer limited to luxury goods, but have made their way into an array of products ranging from fake oil being sold to fake auto parts

R&D/ Innovation Failure

- As of September 2012, India had an installed power generation capacity of 207GW, the world's fifth largest. Yet the country still witnesses frequent power outages and in many areas, electrical supply is rationed.

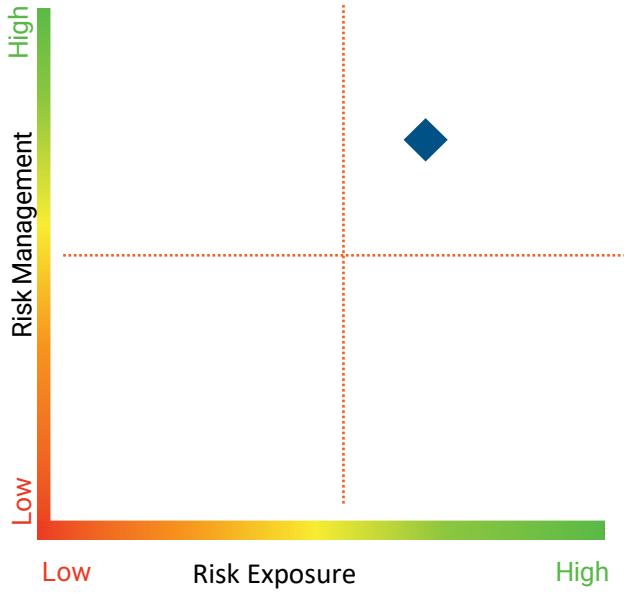
- The original target for installed power generation capacity under India's 11th Five Year Plan (April 2007 to March 2012) was 78,000MW, but the country could only add about 55,000MW, against the revised target of 62,000MW. In fact, India has missed every capacity addition target since 1951.

- The country has missed investment targets for the last 60 years and according to figures from the International Energy Agency, another $1.62 trillion will be needed for supply infrastructure between 2012 and 2035.

Risk Dimension Analysis: Operational and Physical

Risk Exposure Score: 62

Risk Management Score: 65



Accidents/ Fire Safety

- A state-wise analysis of accidents due to electricity has indicated that 85 per cent of them occur in 11 states.
- As per the 2020 ADSI report, 15,258 people died between January and December 2020 due to electrical shock and fire, while CEA reports 7717 fatal human accidents between April 2019 and March 2020.
- According to the National Crime Records Bureau (NCRB), India witnessed close to 63,557 fire-related accidents resulting in 62,832 tragic deaths between 2016-2020, which on an average translates to 35 people getting killed by fire every dat during the five years period.

Strikes/Closure/Unrest

- As the Parliamentary Standing Committee on Energy, headed by veteran BJP MP Jagdambika Pal, is scheduled to hold its first meeting on the controversial Electricity (Amendment) Bill, workers in the power sector - production and distribution companies and departments - have threatened an indefinite strike if the Bill were passed in Parliament.
- The National Coordination Committee of Electricity Employees and Engineers (NCCOEEE), an umbrella organisation of trade unions representing 27 lakh employees in the sector, has also decided to send a memorandum to Mr. Pal, to hear them before pushing the Bill in the committee.

Supply Chain Risk

- The sector was grappling with numerous challenges within its supply chain networks even before recent disruptions driven by the pandemic and the Russian invasion of Ukraine.
- These disruptions—ranging from logistics bottlenecks to shortages of raw materials and components and labor shortages—have resulted in rising costs and a scarcity of essential electric supplies.
- The impact of these disruptors on the electric power sector has been wide-ranging—from increased costs to project delays. They're not only impacting grid modernization efforts and clean energy deployment, but also causing service-related delays.

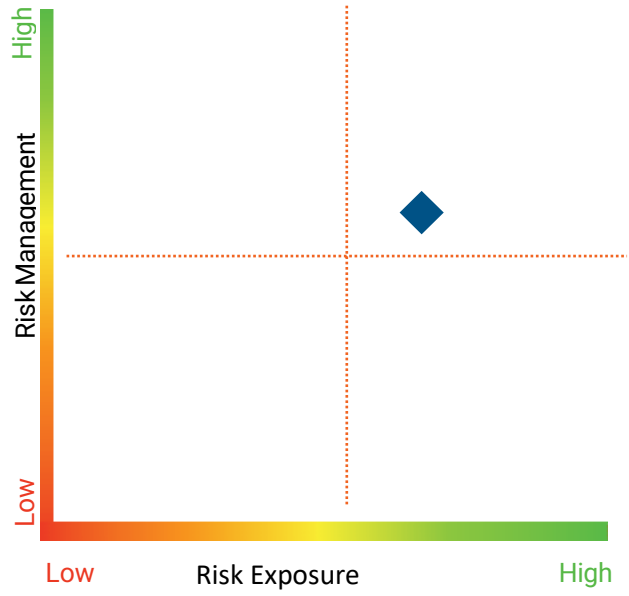
Environmental Risk

- India's financial sector is highly exposed to the risks of the economy transitioning from being largely dependent on fossil fuel to clean energy.
- An analysis of individual loans and bonds found that 60% of lending to the mining sector was for oil and gas extraction, while one-fifth of manufacturing sector debt is for petroleum refining and related industries.
- Electricity production – by far the largest source of carbon emissions – accounted for 5.2% of outstanding credit, but only 17.5% of this lending is to pure-play renewables.

Risk Dimension Analysis: Crime and Security

Risk Exposure Score: 59

Risk Management Score: 62



Cyber Crimes

- There are growing concerns that the country's power infrastructure could be the next target of terrorists looking to cripple India's economy.
- The Indian government has highlighted the cybersecurity of the country's nationwide electricity network as a challenge in its public statements. A report by U.S.-based cybersecurity company Recorded Future in April alleged that Chinese state-sponsored hackers had targeted the Indian power sector in a long-term project.

Harassment/Bribing

- Corruption has caused a huge misallocation of resources, including capital, and consequently ineffectiveness, in a system that would otherwise have delivered energy to millions more of India's population.
- Electricity theft is substantial in magnitude but that the extent of theft varies with the electoral cycle of the state. In years when elections to the State Assembly are held, electricity theft is significantly greater than in other years. Most theft is by relatively well-off farmers rather than by industry or ordinary households.

Executive threat/ Impersonation

- Bad governance is a key cause of chronic electricity shortages, but almost one-third of the power generated in India is lost to damaged equipment or theft.
- Indian state utility Dakshin Haryana Bijli Vitran Nigam detected 1,920 cases of power theft in Gurgaon in the current financial year, while Hisar reported 2,400 cases.

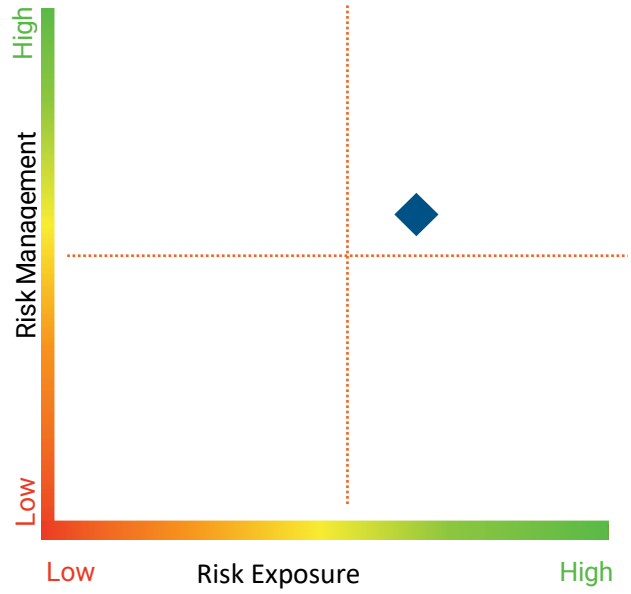
Physical violence/ abuse

- Reforms in the power sector and changes in management responsibility of the distribution segment have coincided with higher power tariffs without a simultaneous increase in reliability and continuity of power supply.

Risk Dimension Analysis: Natural Hazard and Event

Risk Exposure Score: 60

Risk Management Score: 63



Natural Hazards:

- India is one of the ten most disaster-prone countries of the world.
- The natural geological setting of the country is the primary basic reason for its increased vulnerability. The geo-tectonic features of the Himalayan region and adjacent alluvial plains make the region susceptible to earthquakes, landslides, water erosion, etc.
- Natural disasters and reduced energy consumption are crucial in regions of severe and recurring natural disasters. Several characteristics, such as higher population density, vulnerable land, and the total population affected by a disaster, are likely to influence an area's energy demand.
- While states with a low flood magnitude do not affect energy consumption, states with a high flood magnitude significantly influence energy consumption across states

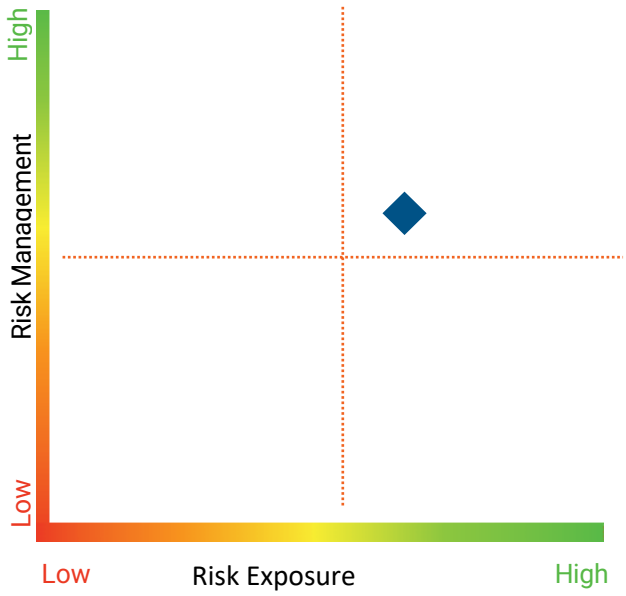
Pandemic and other global epidemic diseases:

- The Indian renewable sector deals with rising uncertainties in the wake of the COVID-19 pandemic and subsequent lockdowns.
- As electricity cannot be stored in large amount, the power generation and supply for a given day are planned based on the forecast for demand. The total power supply saw a decrease of about 25% (year-on-year).
- Energy deficit indicates the shortfall in energy supply against the demand during the day. The average energy deficit between March 25 and April 19 has been 0.42% while the corresponding figure was 0.33% between March 1 and March 24.
- Peak deficit indicates the shortfall in supply against demand during highest consumption period in a day.

Risk Dimension Analysis: Strategic Risk

Risk Exposure Score: 56

Risk Management Score: 58



Resources scarcity and/or misutilization

- As the economy recovers from the impact of the pandemic, a massive surge in energy demand has triggered an unprecedented fuel shortage at the country's coal-fired stations. According to data from the Central Electricity Authority of India, nearly 80% of the country's coal-fired plants are in the critical, or "supercritical" stage, meaning their stocks could run out in a few days.
- There are new issues of lack of capacity-building to withstand shocks, inability to manage resources in tandem with demand and inaccessibility to people.
- The current trouble highlights, a lack of foresight in exploiting conventional energy and not backing it up with alternatives can prove catastrophic.

Public Sentiment

- Electricity demand is increasing rapidly in India, although, at 910 kWh, per capita consumption is less than a third of the global average
- Household electrification has been a strong driver of electricity demand growth, reflecting a strong policy push: over half a billion people have gained electricity access since 2000.
- Higher income levels have allowed households to purchase more appliances: almost 40% of Indian households now own a refrigerator compared to 25% in 2010. Cooling systems are also a major driver of increasing electricity demand.

Failed/ Hostile M&A

- Gautam Adani-controlled Adani Power signed a deal on August 18, 2022, to take over the thermal power assets of DB Power Limited (DBPL) from the Dainik Bhaskar Group for around Rs 7,017 crore enterprise valuation.
- It was announced that Adani Power will be completing the deal by October 31, 2022. But the deadline was later extended multiple times, with the last extension of the deadline to February 15, 2023.
- The deal was called off within weeks after US-based short seller Hindenburg Research accused the Gautam Adani-led Adani Group of “brazen stock manipulation” and “accounting fraud”.

ICICI LOMBARD: Key Solution Offerings

Property

a. Businesses are always prone to risks and fire eruption and fire insurance provides a comprehensive protection against damages caused due to fire explosion and other risks. Besides fire related perils, it also protect damages caused due to any natural calamity, bursting of water tanks, theft etc. The built in covers include alterations or extensions, stocks on floater basis, temporary removal of stock, cover for specific contents, start-up expenses, professional fees, costs for removal of debris etc

b. **Solutions**

i. **Property Loss Prevention exercise** - We have developed the methodology of Property Value Added Services for corporate customers which focuses on technical engagement with detail risk visit, followed by benchmarking of the risk (Industry Risk Profiling).

ii. **Fire Hydrant IoT** - Fire hydrant online monitoring devices use IoT to monitor fire hydrants and assure their availability in emergencies. We've helped multiple corporate customers maintain and monitor this important fire safety component in real time.

Marine

a. We offer specially curated plans for covering the risk of theft, malicious damage, shortage, and non-delivery of goods, damages during loading and unloading, and mishandling of goods/cargo

b. Marine Cargo insurance primarily covers loss during transit caused due to fire, explosion, hijacks, accidents, collisions, and overturning

c. **Solutions**

i. **GPS Device Tracking**: With the help of our advance GPS devices we can have bird eye view on the consignment and vehicle from anywhere in the world. OurSAAS allows us to track and get the visibility of the vehicle on the basis of our requirements which is fully customizable

Liability

a. **Comprehensive general liability:**

i. This policy is important for every small and medium sized businesses to protect the insured entity against claims arising out of legal liability where they are heldresponsible for third party bodily injury or property damage due to insured's business, premises or products. It should be taken by every new business as it covers all risk a business may face.

b. **Cyber** - With cyber risk steadily increasing, security/ data breaches affect millions of records a year. Cyber Risk insurance coverage is designed to help an organization mitigate its risk exposure by offsetting costs involved with recovery after a cyber-related security breach or similar event.

c. **Solutions**

i. **Simulated phishing tests** - Simulated real looking phishing tests andrecord employee behavior to phishing attacks along with training collateral in form of co-brandable posters, infographics and videos

ii. **Cyber maturity assessments** - Assess the security posture of your organization and identify the potential risks with our assessment based on ISO 27001 Control measures for Information security

iii. **D&O** - The need of Directors & Officers Insurance is more than ever before. Any breachor non-performance in the duties can result in claims against directors, officers and employees by reason of wrongful act and need to incur various expenses like defense costs, damages or compensation and other incidental costs. This can affect company's growth and performance.

Group Health

a. Employees are the backbone of an organization and the most valued asset. OurGroup health insurance product is designed to offer health coverage to suit employees of all business types ranging from small & medium enterprises to large organizations.

b. Solutions:

i. **IL Take Care -** AI enabled mobile app for employees

ii. **Health assistance services -** Health Assistance is a dedicated medical care service that assists you in all your health related queries for identifying specialist/hospital/fixing an appointment with doctors/nutritionist /facilitating2nd opinion

iii. **Tele Consultation** – Hello Doctor

iv. The insured is eligible to avail unlimited General Physician consultations for routine health issues over the phone by aqualified doctor

v. **Diagnostics & pharmacy services** – Book a lab test or home delivery of medicines

Bibliography

https://iea.blob.core.windows.net/assets/1de6d91e-e23f-4e02-b1fb-51fdd6283b22/India_Energy_Outlook_2021.pdf
https://indianexpress.com/article/india/fossil-fuel-contribute-india-annual-inflation-8450960/
https://indianexpress.com/article/india/fossil-fuel-contribute-india-annual-inflation-8450960/
https://energy.prayaspune.org/our-work/research-report/energy-taxes-and-transition-in-india
https://www.oecd.org/tax/tax-policy/taxing-energy-use-india.pdf
https://energy.economictimes.indiatimes.com/news/power/strong-regulations-demand-to-mitigate-receivables-and-leverage-risks-for-power-utilities-in-2023/96759056
https://powermin.gov.in/en/content/national-electricity-policy
https://www.ibef.org/industry/renewable-energy
https://energy.economictimes.indiatimes.com/energy-speak/geopolitical-risks-can-scuttle-india-s-renewable-energy-ambitions/5229
https://www.hindustantimes.com/opinion/enhancing-competition-in-india-s-power-sector-101613486817789.html
https://www.power-technology.com/comment/disruptive-technologies-power-sector/
https://www.legal500.com/developments/thought-leadership/renewable-energy-and-patents-in-india/
Trend Micro, "What We Know About the DarkSide Ransomware and the US Pipeline Attack", at
https://www.trendmicro.com/en_in/research/21/e/what-we-know-about-darkside-ransomware-and-the-us- .pipeline-attac.html.
https://www.dsci.in/sites/default/files/Securing%20Energy%20Sector%20from%20Ransomware%20Attacks.pdf
https://www.power-technology.com/features/featurepower-struggle-india-controversial-energy-industry/
https://www.livemint.com/industry/energy/how-cyber-attacks-are-increasing-in-india-s-power-sector-1568107532851.html
https://techcrunch.com/2022/10/14/india-power-company-tata-power-cyber-attack/
https://www.researchgate.net/publication/228155890_Corruption_and_Theft_of_Electricity_in_an_Indian_State
https://energy.economictimes.indiatimes.com/news/power/as-many-as-85-per-cent-accidents-due-to-electricity-occur-in-11-states/92121738
https://realty.economictimes.indiatimes.com/blog/fire-safety-over-cost-indias-path-to-sustainable-growth/97909115
https://www.thehindu.com/news/national/power-sector-employees-threaten-nationwide-strike-over-electricity-amendment-bill/article66184714.ece
Jim Thomson and Marlene Motyka, "Global supply chain disruptions could slow grid modernization and decarbonization," POWERGRID International, October 27, 2021.
https://www.thehindu.com/sci-tech/energy-and-environment/study-warns-of-risk-to-indian-financial-institutions-from-transition-to-clean-energy-economy/article66419679.ece
https://erl.scholasticahq.com/article/27017-impact-of-natural-disasters-on-energy-consumption-evidence-from-indian-states
https://prsindia.org/theprsblog/impact-of-covid-19-on-the-power-sector
https://www.businessworld.in/article/Energy-Crisis-In-India-Observations-And-The-Path-Ahead/26-01-2022-418763/
https://iea.blob.core.windows.net/assets/2571ae38-c895-430e-8b62-bc19019c6807/India_2020_Energy_Policy_Review.pdf

Notes:

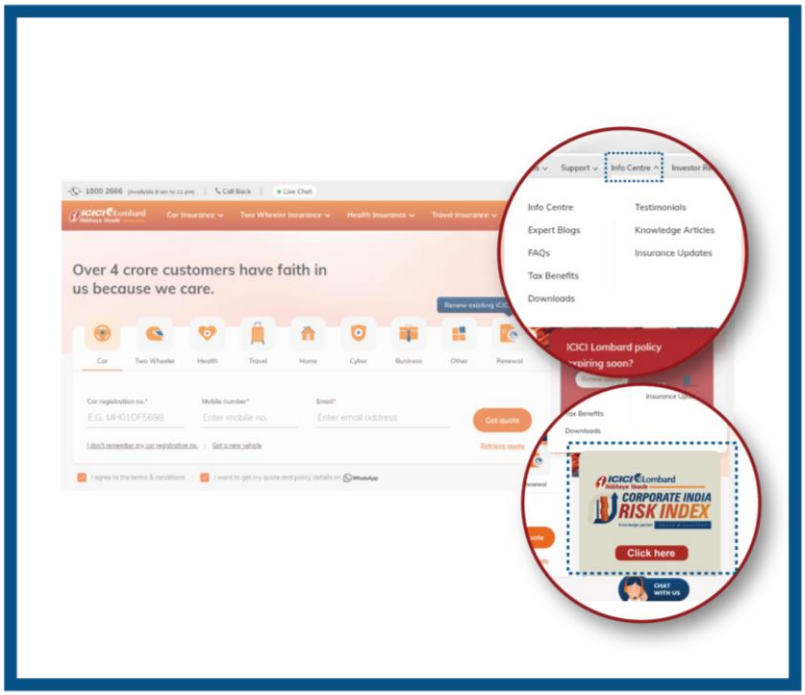
ICICI Lombard
Nibhaye Vaade

CORPORATE INDIA RISK INDEX

Intelligence partner FROST & SULLIVAN

Now accessible at

www.icicilombard.com/corporate-india-risk-index



Please send a mail to ciri@icicilombard.com to get your customized ICICI Lombard Corporate India Risk Index Report

ICICI Lombard
Nibhaye Vaade

CORPORATE INDIA RISK INDEX

Intelligence partner FROST & SULLIVAN