



**BSE-GREENEX**

i n d e x f a c t s h e e t

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## **About the Index**

The BSE-GREENEX is the 25<sup>th</sup> dynamic index hosted on the Bombay Stock Exchange. It is a first of its kind benchmark index, which assess the 'carbon performance' of stocks based on purely quantitative performance based criteria. Unlike existing global indices that measure environmental performance through various scaled quantitative criteria, the BSE-GREENEX applies sector specific proprietary algorithms, developed in cutting edge research facilities, to assess energy efficiency performance of various companies based on publicly disclosed energy and financial data.

The BSE-GREENEX is a veritable first step in creating an inclusive market based mechanism for the promotion of energy efficient practices amongst the larger business entities in India. BSE Ltd. in close association with gTrade Carbon Ex Ratings Services Private Limited (gTrade) has co-developed the BSE-GREENEX.

The mission of gTrade is to create viable market based solutions for industries, investors and governments, to promote energy efficient practices and encourage impact investing in economically and environmentally sustainable businesses. It seeks to achieve its mission by developing and promoting a "green ethos" in high growth developing nations through market based push and pull factors by providing financial tools to investors. The BSE-GREENEX is the outcome of the joint collaboration which consists of 20 largest and most efficient companies on the carbon emissions front from the BSE-100 Index.

One of the parameters for measurement of environmental performance used in BSE-GREENEX calculation, and received from gTrade, is emissions intensity viz. total emissions upon total revenue (which is assumed to be a close proxy for energy efficiency). Mandatory disclosures on energy usage by assessed companies make it possible to estimate these numbers for listed companies.

Additionally, BSE-GREENEX is the first environmental friendly equity index to be publicly disseminated on a real-time basis, providing a new tool for use by "green" retail and institutional investors to track the performance of India's largest and most liquid, energy efficient stocks. The index can be licensed for the development of green financial products including mutual funds, ETFs and structured products.

BSE-GREENEX is also India's first objective green equity index to employ index constituent weight capping. Index constituent weights are capped at 6 percent during dynamic rebalancing, in an effort to increase the diversification within the index and ensure greater compliance with international regulatory and statutory investment guidelines.

## Carbon Intensity Estimation Methodology

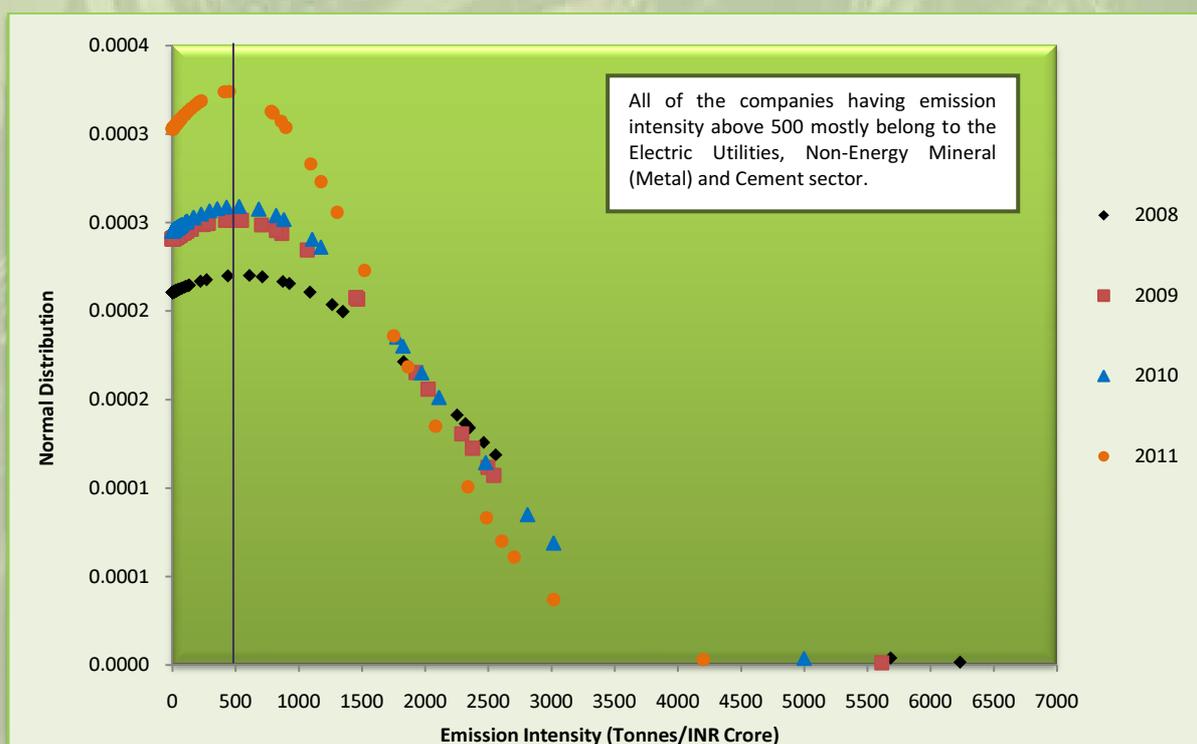
Carbon intensity of a company is estimated as total greenhouse gas emissions from a company divided by its total revenue. This is estimated on an annual basis following internationally accepted methodologies and best practices. Data for BSE-100 companies was extracted from companies' annual reports on multiple parameters. Fuel consumption, electricity consumption (including purchased electricity), energy generation (when generated internally using fuels), and production / raw material data (for the Cement Sector) from Form 'A's (of Directors' report) enclosed within the annual reports of listed companies were extracted for use in the GHG inventorying model developed specifically for this effort.

The 2006 IPCC Guidelines for National Greenhouse Gas Inventories were followed for energy and process related emissions for listed companies. In case this data was not disclosed by a company, its financial data such as power and fuel expenditure was used through appropriate econometric modeling to estimate its GHG emissions.

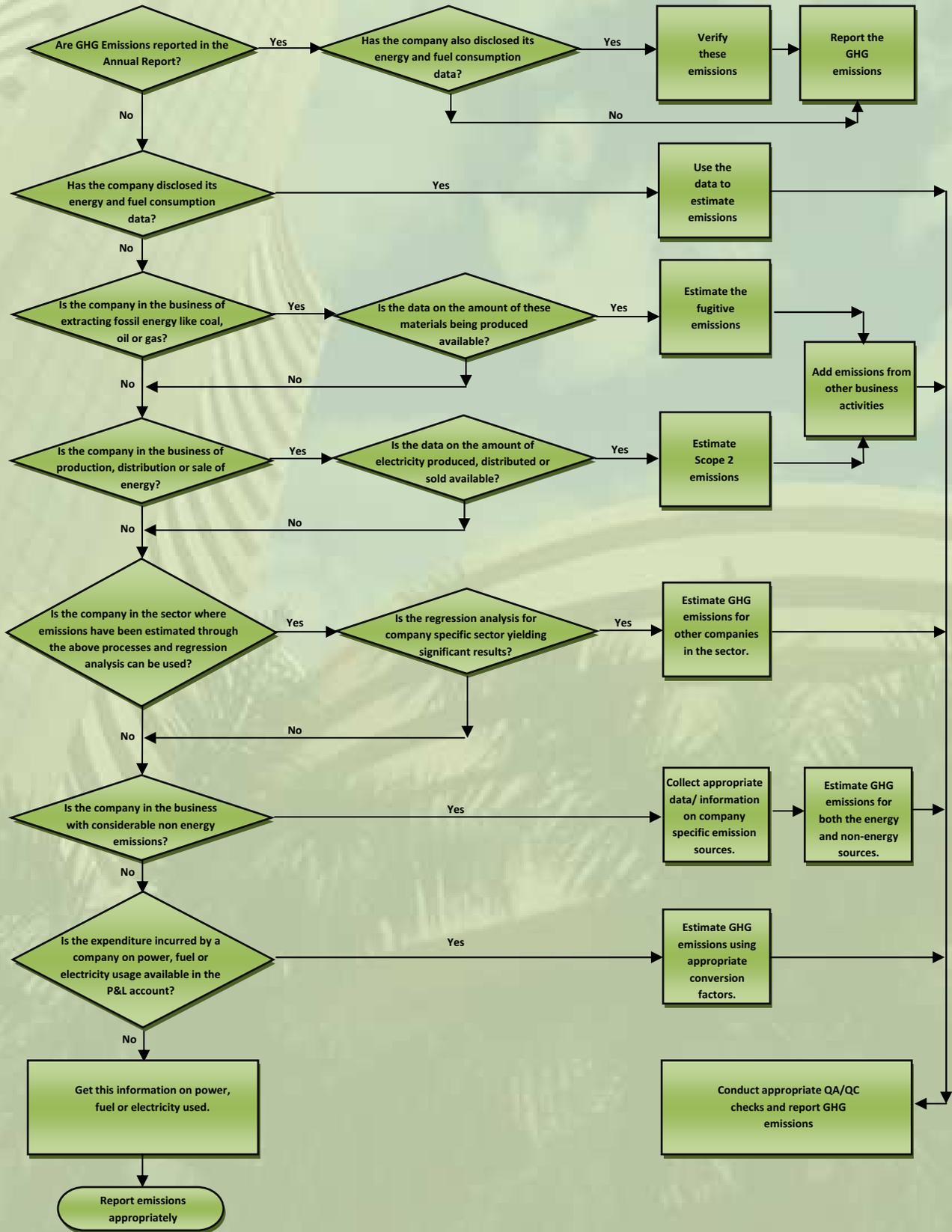
The data for standalone part (Form A) was extrapolated appropriately for estimating GHG emissions on a consolidated basis.

The analysis adopts multiple methods for calculating GHG emissions for companies depending on the industry segment and business operations of company, and also availability of appropriate information for those sectors. The flow chart captures the stepwise estimation of GHG emissions for companies.

The emission intensity distributions of BSE-100 companies are shown below for FY 2008, 2009, 2010 & 2011 in Normal Distribution. These are moving towards left indicating that the total carbon emission by total revenue of the companies is generally reducing over the years, which is a positive for the Indian economy. The reasons may be many, such as energy and economy decoupling, carbon and energy decoupling, newer technology penetration, economies of scale and sector consolidation.



# Flow Chart for Estimation of Emissions



## Index Methodology

BSE-GREENEX includes the top 20 companies from the BSE-100 Index, which are good in terms of Carbon Emissions, Free-Float Market Capitalization and Market Turnover. The Index is a Cap Weighted Free-Float Market Capitalization weighted Index.

BSE Ltd. should have the recent Carbon Intensity Number calculated by gTrade prior to the rebalancing date i.e. every year in September. In case BSE Ltd. doesn't have the recent Carbon Intensity Number for a company, the company will be deemed in-eligible for the Index.

Once the Carbon Intensity Numbers are available from gTrade, the process utilized by BSE Ltd. to arrive at the final selection of stocks in to the BSE-GREENEX is as follows:

1. Scale the Carbon Intensity (C), Average Free-Float Market Capitalization (M) & Average Turnover (T), from 0 to 100 within the sector.
2. Assign points to the above mentioned numbers from 1 -50 within the sector.
  - For C: For 0-2, assign 1; for 2-4, assign 2; and so on.
  - For M & T: For 0-2, assign 50; for 2-4, assign 49; and so on.
3. Calculate the composite point for a company by taking the summation of the points multiplied by their respective weights, where C is weighted 50%, M is weighted 40% and T is weighted 10%.
4. Rank the companies on the basis of the composite point.
5. For base composition take top 20 companies.
6. Review frequency: Bi-Annual (September & March)
  - For September review, recent Carbon Intensity numbers received from gTrade, Average Market Capitalization and Average Turnover for quarter ended September will be taken into account.
  - For March review, the Carbon Intensity numbers with BSE Ltd. received in September of the previous year from gTrade, Average Market Capitalization and Average Turnover for quarter ended March will be taken into account.
7. On-going review:
  - **Mandatory Exclusions:** If the existing constituent ranks beyond 28 (i.e. 29, 30....) by final rank the company will be excluded.
  - **Mandatory Inclusions:** If a non constituent ranks within 12 (i.e. 1 to 11) than the company will be included.
8. Capping individual stock at 6%. Capping is done at each rebalancing or inclusion/exclusion from the index between two rebalancing.
9. In case a company is excluded from BSE-100, the same will also be excluded from this index.

10. If an index constituent is traded under the 'Ex-Entitlement' basis it will be excluded from the Index. This is done because during this period BSE is unable to ascertain the valuation of the constituent and valuation of a constituent is required for Index calculation.
11. Upon re-listing from suspension or from ex-entitlement, the company becomes part of the regular stock universe that can be considered for inclusion in the index upon subsequent review.
12. Rebalancing dates post Index review are:
  - 2<sup>nd</sup> Monday of October for the September review.
  - 2<sup>nd</sup> Monday of April for the March review.

## Index Performance

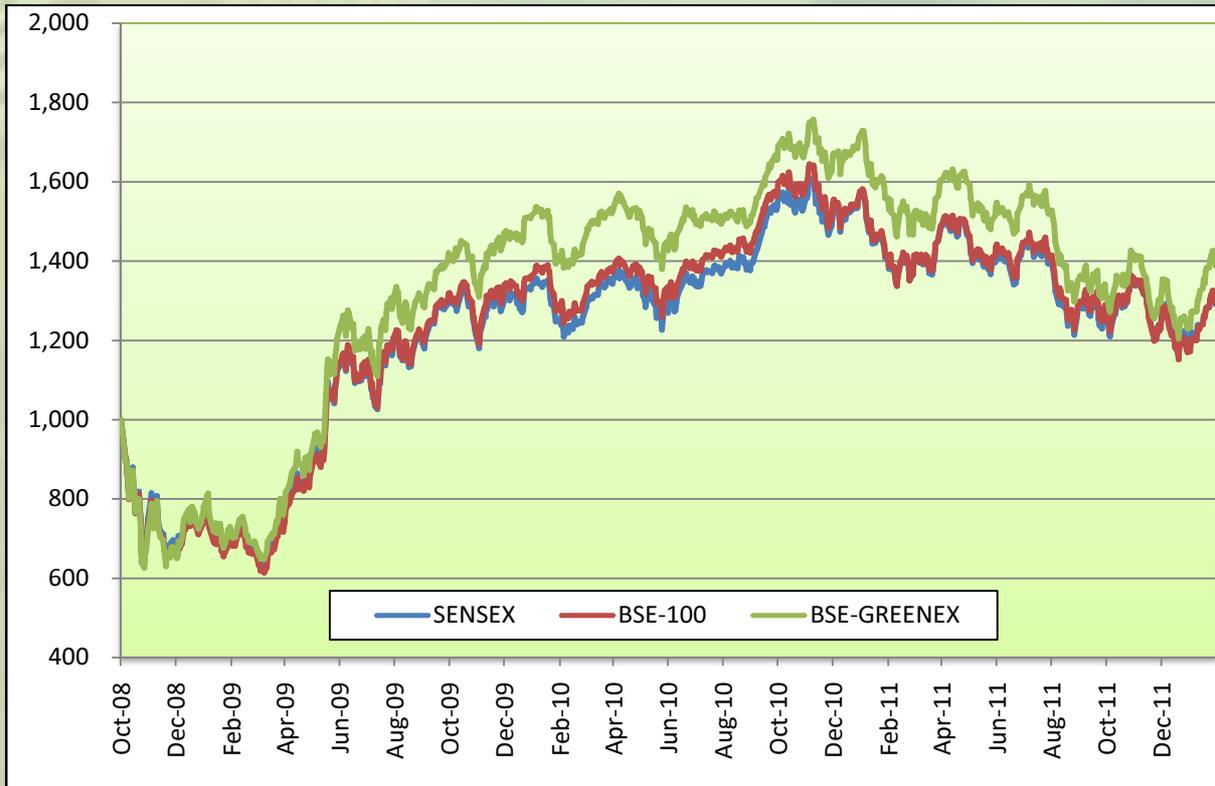
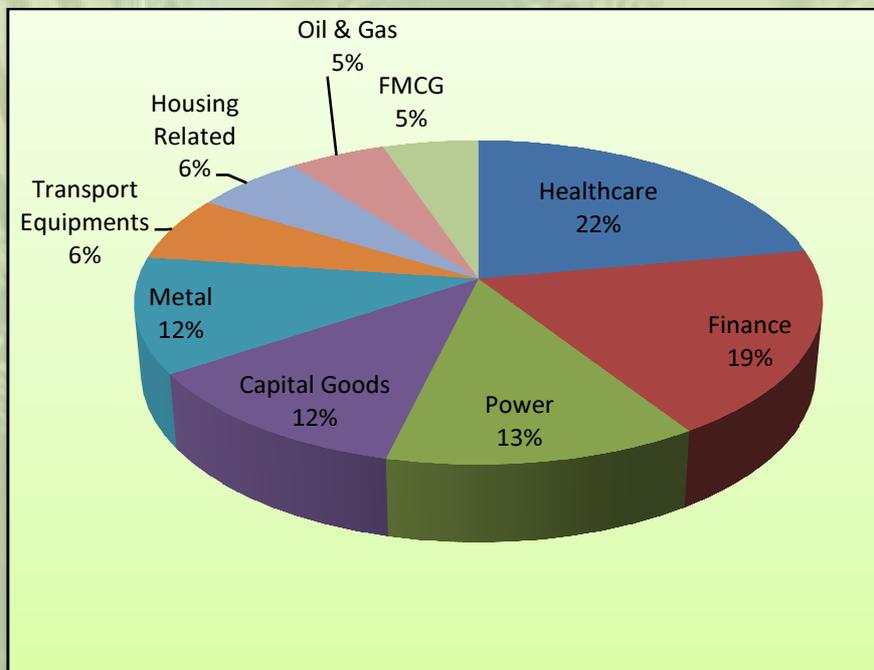


Chart from October 1, 2008 till January 31, 2012



Sectoral Representation as on January 31, 2012

## Index Returns

Returns	BSE-GREENEX	SENSEX	BSE-100
1 Year	-6.26%	-9.17%	-6.19%
2 Year	3.01%	0.62%	5.11%
3 Year	87.25%	94.23%	82.44%
Since Inception	32.36%	41.59%	31.69%

~ Returns up to 31-Jan-2012; Inception Date - 01-Oct-2008

## Index Volatility

Volatility (Annualised )	BSE-GREENEX	SENSEX	BSE-100
1 Year	20.6%	20.9%	20.1%
2 Year	18.1%	18.7%	18.1%
3 Year	23.9%	24.1%	23.5%
Since Inception	29.8%	29.4%	28.6%

~ Annualised Volatility up to 31-Jan-2012; Inception Date - 01-Oct-2008

## Constituents as on January 31, 2012

SR No	Name	Market Capitalization*	Weight
1	Tata Steel Ltd.	24,211.12	6.70%
2	State Bank Of India	24,040.43	6.65%
3	Larsen & Toubro Ltd.	23,603.11	6.53%
4	ICICI Bank Ltd.	23,566.41	6.52%
5	Tata Motors Ltd.	23,308.38	6.45%
6	Sun Pharmaceutical Inds. Ltd.	21,315.29	5.90%
7	NTPC Ltd.	21,298.11	5.90%
8	Dr Reddys Laboratories Ltd.	20,484.17	5.67%
9	Housing Development Finance Corporation Ltd.	20,312.97	5.62%
10	Bharat Heavy Electricals Ltd.	19,468.49	5.39%
11	GAIL (India) Ltd.	18,918.07	5.24%
12	Hindustan Unilever Ltd.	18,657.39	5.16%
13	Cipla Ltd.	18,222.10	5.04%
14	Sterlite Industries (India) Ltd.	17,489.93	4.84%
15	Tata Power Company Ltd.	17,251.05	4.78%
16	Ambuja Cements Ltd.	12,321.64	3.41%
17	Lupin Ltd.	11,633.80	3.22%
18	DLF Ltd.	9,166.12	2.54%
19	Glaxosmithkline Pharmaceuticals Ltd.	8,188.03	2.27%
20	Reliance Infrastructure Ltd	7,804.71	2.16%

\*Capped Free Float Market Capitalization in the index in INR CRS.

## **Frequently Asked Questions**

### **1. What is climate change?**

Climate change refers to a statistically significant variation in either the mean state of the climate or in its variability, persisting for an extended period (typically decades or longer). Climate change may be caused due to natural internal processes or external force, or due to persistent anthropogenic changes in the composition of the atmosphere or in land use.

### **2. What are greenhouse gases?**

Greenhouse gases are those gaseous constituents of the atmosphere, both natural and anthropogenic, that absorb and emit radiation at specific wavelengths within the spectrum of infrared radiation emitted by the Earth's surface, the atmosphere and clouds. This property causes the greenhouse effect. Water vapour (H<sub>2</sub>O), carbon dioxide (CO<sub>2</sub>), nitrous oxide (N<sub>2</sub>O), methane (CH<sub>4</sub>) and ozone (O<sub>3</sub>) are the primary greenhouse gases in the Earth's atmosphere.

### **3. What is greenhouse gas (GHG) emission?**

The emission of green house gasses, both natural and anthropogenic, into the atmosphere is known as greenhouse gas emission.

### **4. What are the types of GHG emissions?**

GHG emissions are of two types, direct and indirect emissions. Direct emissions are physical emissions from sources that are owned or controlled by a company/individual e.g. from captive power plants. Indirect emissions are a consequence of the activities of a company/individual and occur at sources owned or controlled by another entity, e.g. electricity purchased from the grid.

To facilitate accounting of GHG emissions there are operational boundaries defined by "scope":

- **Scope1:** Reporting organization's direct GHG emissions for e.g. fossil fuel combustion, company owned vehicles.
- **Scope 2:** Indirect emissions from electricity/ heat/ steam used for own consumption.

- **Scope 3:** This is an optional reporting category. Includes all other indirect emissions not covered under Scope 2.

5. **What is emissions intensity?**

Emissions intensity for a company is defined as the total GHG emissions (excluding scope-3 emissions) divided by the total revenue of the company.

6. **What are the guidelines for the emission intensity estimation?**

The 2006 IPCC Guidelines for National Greenhouse Gas Inventories are followed by gTrade to estimate GHG Emissions. Disclosures by listed companies of their fuel consumption, energy consumption (when purchased from outside sources), energy generation (when generated internally using fuels), and in the case of specific industrial sectors - emissions from Industrial Processes and Product Use (IPPU) are used in estimating emissions. In cases, where energy data is not available or sufficient, data on usage of other energy related materials like power and fuel is used appropriately. Emissions are estimated using internationally established methodologies and statistical tools like econometric regressions etc. In cases where companies clearly report renewable credentials in quantifiable numbers, the numbers are appropriately considered. Subsequently, emission intensity is calculated for each assessed company.

7. **Why are stock weights capped?**

BSE-GREENEX is the third Real Time Index to utilize stock-level capping, which increases diversification and makes related products more attractive to investors subject to regulatory and statutory diversification requirements.

8. **What is the benefit of green compliant Index?**

Over the years sizable funds and finances will increasingly find their way into green businesses. The creation of this Index will enable such investment flows.

## Contact

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