

slow to switch

INDIA'S LARGEST CORPORATES LAGGING ON RENEWABLE
ELECTRICITY



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I. List of Abbreviations

AM/NS India	ArcelorMittal Nippon Steel India
BALCO	Bharat Aluminium Company Limited
BESS	Battery Energy Storage System
BRS	Business Responsibility and Sustainability
BU	Billion Units (Billion kWh)
FMCG	Fast Moving Consumer Goods
FY	Financial Year
GSFC	Gujarat State Fertilizers Chemicals Limited
GW	Gigawatt
HFO	Heavy Fuel Oil
HUL	Hindustan Unilever Limited
IT	Information Technology
MU	Million Units (Million kWh)
NALCO	National Aluminium Company Limited
NDC	Nationally Determined Contribution
PJ	Petajoules
TJ	Terajoules
PPA	Power Purchase Agreement
PV	Photovoltaic (solar)
RCF	Rashtriya Chemicals and Fertilizers
RE	Renewable Energy

REC	Renewable Energy Certificate
RPO	Renewable Purchase Obligation
RTC	Round-The-Clock
SAIL	Steel Authority of India Limited
SBTi	Science Based Targets initiative
TCS	Tata Consultancy Services
WHRS	Waste Heat Recovery Systems

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1.0

Executive Summary



India has set ambitious targets for renewable energy (450 GW by 2030). As of January 2024, India had 45 GW of installed wind and 74 GW of solar capacity. Meeting India's 2030 targets will require an average annual capacity addition of roughly 50 GW. While ambitious and far above current rates, this is by no means unachievable. However, meeting these targets will require leveraging the resources of all sectors and players in the energy space.

This analysis looks at the role played by seven key industries of the economy (and the largest private and public sector companies in each of these industries) in driving India's energy transition.

India's growing industrial sector accounts for over 52% of the country's total energy demand. Around 11% of the energy consumption of heavy industry is derived from electricity, and even less from pure RE

(wind/solar PV). India's RE growth over the last 8–10 years has been predominantly driven by utility scale solar with guaranteed offtake by central and state sector utilities. In contrast, captive RE and Power Purchase Agreements (PPAs) with dedicated consumers account for a relatively tiny proportion of total RE.

While some industries and companies have started to make progress, for the most part, companies' rhetoric and targets are yet to be matched by concrete investments and changes in power sourcing practices.

Compared to traditional fossil fuel reliance, renewable energy now offers significant cost and business planning advantages. Despite this, India's largest companies have been slow to ramp up RE purchases through captive solar/wind installations or RE PPAs.

Addressing this gap and harnessing the financial muscle of India's corporate actors is crucial to speed up the energy transition. Doing so will catalyse demand for RE, which is in turn needed to drive indigenisation of the Indian renewable energy supply chain, lower costs and boost energy security.

This analysis examines 33 companies across seven industries, of which five are energy intensive—cement, steel, aluminium, textiles and fertilisers. The remaining two—the Information Technology (IT) industry and the Fast Moving Consumer Goods (FMCG) industries—have a relatively low energy footprint, but have been considered in this analysis because they contribute significantly to the Indian economy and are relatively easier to transition to renewable energy. These companies are assessed on four dimensions—Reporting and Transparency, Sourcing, Intentions, and Practising.



1.1 Key Findings *and* Recommendations

#01

The heavy industry sector in India has yet to make any serious moves towards decarbonisation. The technological changes necessary are still, for the most part, not cost competitive as most energy consumption is in the form of heat processes, not electricity.

#02

However, heavy industry remains a major consumer of electricity. The heavy industry players considered in this analysis have a combined annual electricity consumption of 169 BU (billion units). However, only 8 BU of this electricity (less than 6%) was from renewable sources. The existing Renewable Purchase Obligations (RPOs) applicable to major electricity consumers are not being met and enforcement on defaulters appears negligible.

Recommendation

Policies to ensure that all electricity consumed by heavy industry comes from RE will be transformative for India's energy transition. Adequately enforced, such policies would also support the development of energy storage technologies, lowering costs further and increasing energy security for industries and the economy. Switching heavy industry's electricity consumption to renewable energy would create 169 BU of RE demand. This is achievable within a relatively short time frame of 3–5 years, through a mix of captive RE and RE PPAs.

#03

There are almost no major pilot projects running for the decarbonisation of heavy industry in India.

Recommendation

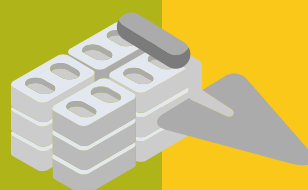
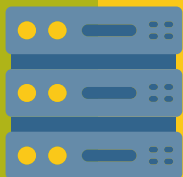
Pilot projects and capital investments are needed, such as Jindal Stainless' green hydrogen pilot to replace ammonia-use in its stainless steel plant.

#04

Companies in the IT and FMCG industries such as Wipro, Infosys, TCS, Godrej and Britannia should be doing much more to guarantee that 100% of their energy consumption comes from RE. These industries appear to outperform heavy industry when it comes to utilisation of renewable energy. However, this is misleading given the relative ease by which they can switch to 100% RE.

Recommendation

The IT and FMCG industries should ensure that 100% of their energy consumption is met by RE by 2030.



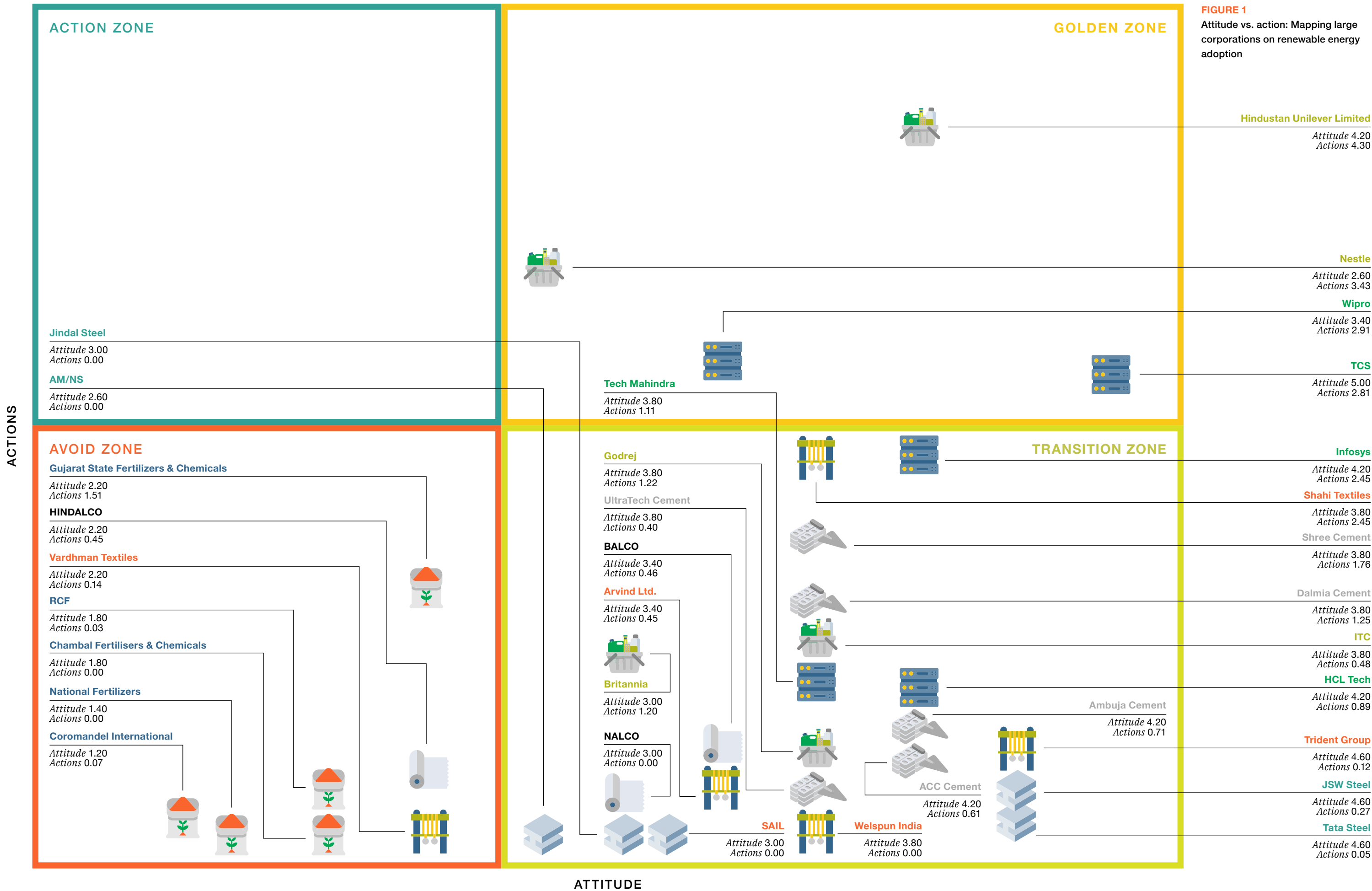
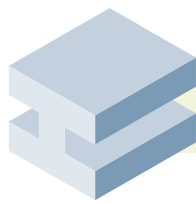


FIGURE 1
Attitude vs. action: Mapping large corporations on renewable energy adoption

Note: This figure maps how a company's stated attitude on renewable energy fares when compared to its actions. By combining reporting, sourcing, and intentions dimensions (see methodology section) we assess a company's 'attitude' towards renewable electricity adoption. The Practising dimension measures the actions of the company in real time.

1.2 Industry-wise Findings

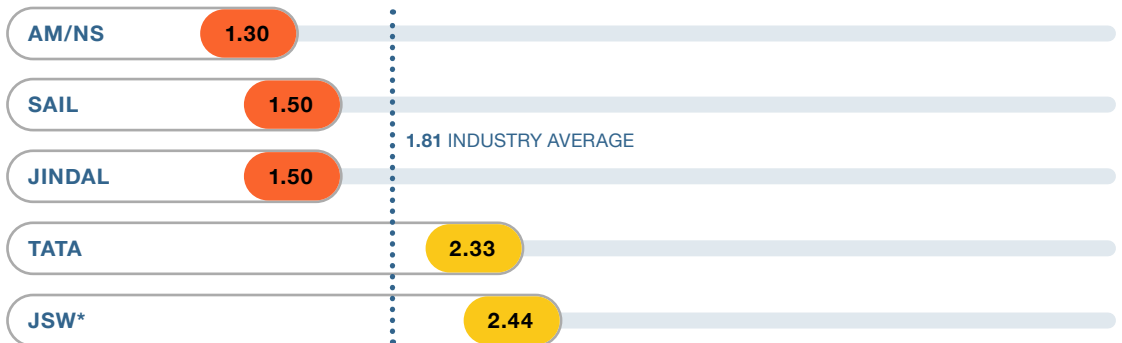


STEEL

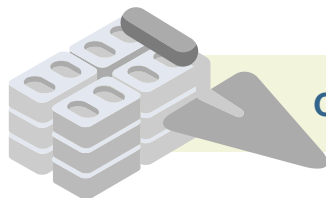
The five steel companies assessed in the report consumed about 656 BU of energy in 2022–23. Electricity accounted for 14% of the total energy consumption, equivalent to 94 BU. Only about 0.11% of the total energy

consumed was in the form of renewable electricity. While all companies assessed have targets in place, only TATA and JSW are aligned with the SBTi. None of the companies have made significant progress in terms of their utilisation of RE.

FIGURE 2
Company scores and industry average: steel



*A previous version of this report incorrectly stated that JSW stood second among the companies assessed in Steel industry. JSW in fact stands in first place, ahead of Tata Steel, due to a higher use of renewable energy. The error is regretted.

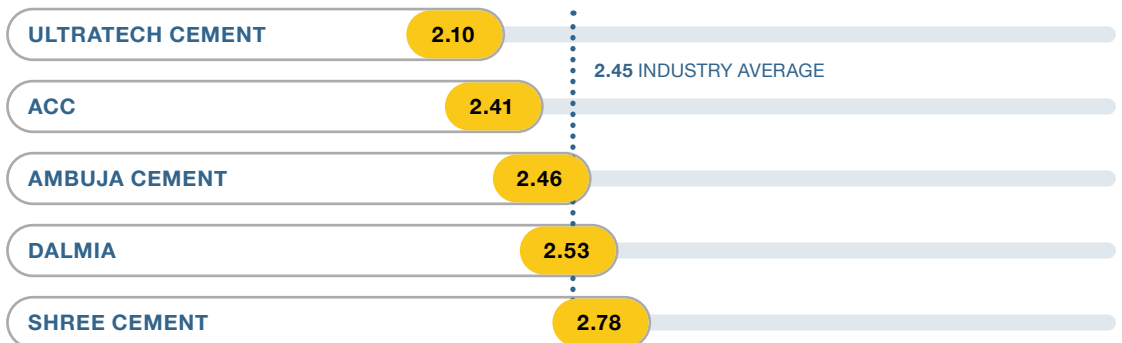


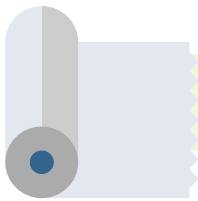
CEMENT

The five cement companies assessed consumed about 216 BU of energy in 2022–23. Electricity accounted for about 26% of the energy consumed, equivalent to 56 BU. However, only 2.5% of their energy demand, equivalent to 5 BU, is met via renewable

electricity. All the five assessed companies are either a member of SBTi, or have their targets aligned with SBTi, and have plans in place to develop new renewable energy capacity. However, actual progress in terms of RE utilisation is negligible.

FIGURE 3
Company scores and industry average: cement





ALUMINIUM

The three main aluminium companies rely primarily on coal or Heavy Fuel Oil (HFO) for their energy consumption. They consumed about 194 BU in 2022–23. Only 7% of the energy, equivalent to about 14 BU, is consumed in the form of electricity. Less than

1% of the overall energy consumption (or 11% of all electricity consumption), equivalent to 1.6 BU, is from renewable electricity. Only BALCO has an RE target (30% RE mix by 2030), but it has yet to make significant progress towards it.

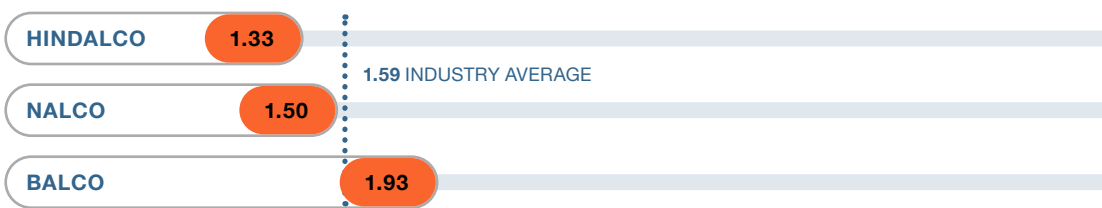
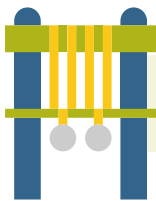


FIGURE 4
Company scores and industry average: aluminium



TEXTILES

The five big companies analysed consumed around 8.9 BU in 2022–23. About 27% of the total energy consumption, equivalent to 2 BU, came from electricity. Less than 3% of the total energy consumption, equivalent to 0.23 BU, is sourced from renewable electricity. Except Vardhman, all the companies have

either set a target for achieving 100% RE in their electricity consumption, or have their targets aligned with SBTi. Shahi has performed better than the others with a 70% share of renewable electricity in overall electricity consumption.

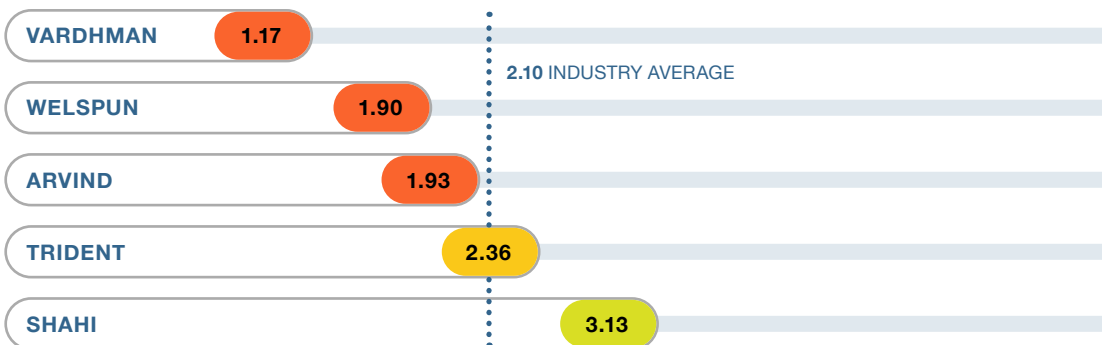


FIGURE 5
Company scores and industry average: textiles

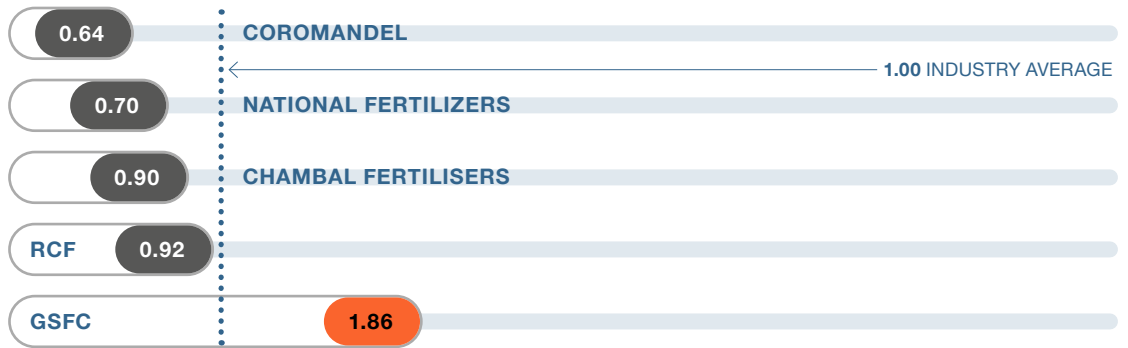


FERTILISERS

The five companies analysed consumed around 47 BU in 2022–23. About 8% of the energy consumption, equivalent to 4 BU, comes in the form of electricity, with the majority coming from conventional electricity. Less than 0.5% of the total energy consumption, equivalent to 0.2 BU, is sourced

from renewable electricity. Only Chambal Fertilisers has set a target related to RE adoption—to increase the share of renewable electricity in its overall electricity consumption “by 10%”—currently the company gets only about 0.2% of its electricity from renewables.

FIGURE 6
Company scores and industry average: fertilisers



FMCG

The five companies analysed consumed around 2.9 BU in 2022–23, with majority of the energy consumption coming from conventional fuels (likely biomass). About 23% of the energy consumption, equivalent to 0.7 BU, is consumed in the form of electricity and of this, about 83%, equivalent to 0.6 BU, is from renewable sources. This high share is mainly a result of Nestle and HUL claiming 100% renewable electricity via a combination of solar, wind and RECs (Renewable Energy Certificates), the relative proportions of

which are not disclosed. ITC Limited, Godrej and Britannia lag far behind. Renewable electricity constitutes only 33% of the total “renewable energy” consumed by HUL, the remaining 67% most likely being derived from biofuels/biomass. Similarly, Nestle’s renewable electricity consumption constitutes only 57% of the overall renewable energy consumption by Nestle. Biomass reliance is problematic and it is not considered truly renewable on an industrial scale.

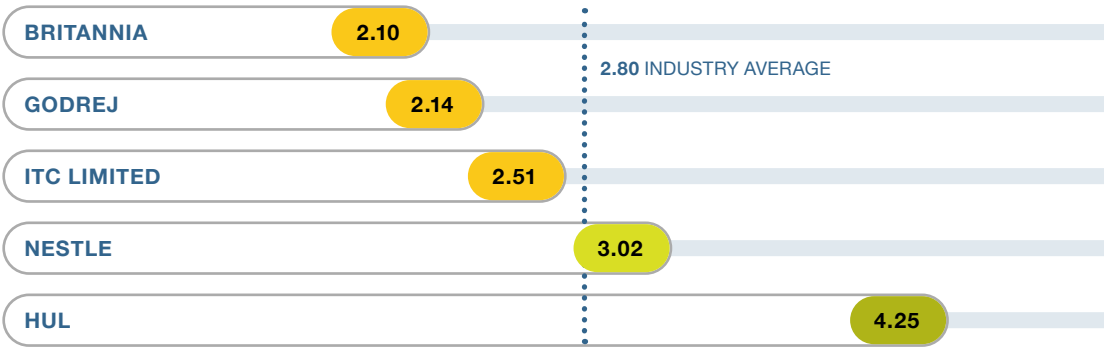
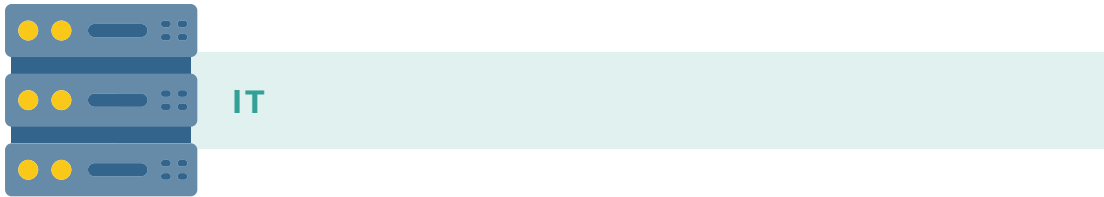


FIGURE 7
Company scores and industry average: FMCG



The IT industry is not a major consumer of energy. However, it is a major contributor to India’s economy, accounting for 7.4% of GDP in 2022. Most of this industry’s energy consumption is via electricity. The five companies analysed here consumed about 1.2 BU of energy in 2022–23. About 95% of the energy consumed, equivalent to 1 BU, was in the form of electricity. However, only 45% of this electricity, equivalent to 0.5 BU,

was from renewable sources. Given the relative ease by which the IT industry can transition to 100% RE, the industry should be expected to rapidly scale up its use of clean energy. Overall, the IT industry scored 3.08, becoming the best performing industry in the analysis. This industry can serve as a model for all industries of the economy, acting as a catalyst for the necessary build out of RE in India.

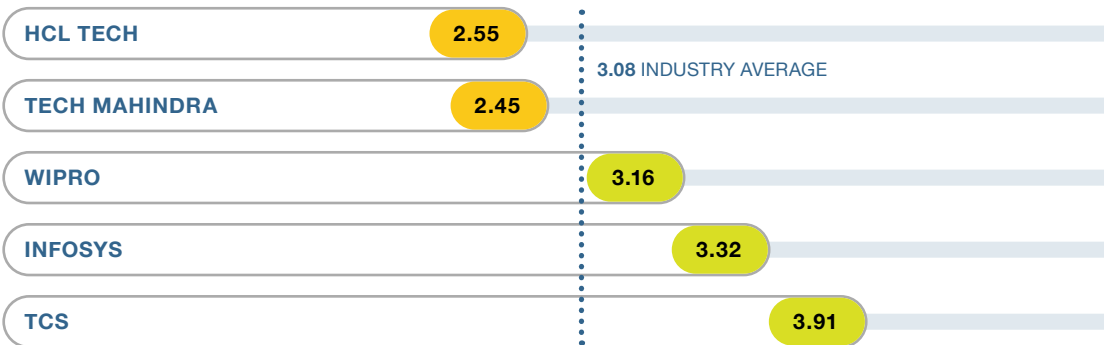


FIGURE 8
Company scores and industry average: IT

1.3 Comparing Industries

Since each industry's energy requirements (heat, fuel, electricity, etc.) are different, it is difficult to rate all the industries on the same scale. This analysis takes into account these differences and scores are adjusted to enable a fair comparison across industries. The Reporting & Transparency, Sourcing, and

Intentions dimensions are qualitative and are not dependent on the type of energy consumed by the company. The Practising dimension rates a company on set targets which are based on the type of energy required by the company. In doing so the dimension adjusts to the differences in energy requirements.

FIGURE 9
Industry-wise
comparison: overall
scores



20

Introduction *and* Context

India is among the world's top three energy consuming economies.¹ Since 2000, India's energy demand has more than doubled, and over 94% of this demand is met by conventional fuels (coal, oil, biomass, and natural gas).² India has made ambitious commitments to reduce its reliance on fossil fuels as part of global efforts to tackle the climate crisis. Under its NDCs as part of the Paris Agreement, India set a target of installing 450 GW of renewable energy, primarily wind and solar PV, by 2030. As of 2024, India has a cumulative 119 GW of wind and solar PV installed.³ It will need to install an average of nearly 50 GW of RE annually to meet its 2030 goal. In the most recent financial year, India installed 18.4 GW only.⁴

While attention has been largely focussed on the actions of government bodies and ministries to achieve this target, the role of individual industries and companies also deserves scrutiny. Industry is the largest consumer of energy in India. In FY 2020–21, over 52% of India's energy demand was from the industrial sector.⁵ Yet, only 11% of the energy consumed by heavy industry is

in the form of electricity,⁶ and even less from pure renewable energy (wind or solar PV). Due to its massive energy footprint, the industrial sector can play a key role in steering the country towards a low carbon economy. It can act either as a catalyst or an inhibitor in the country's energy transition. Clear signals of intent to move a company's energy mix towards renewables send strong market signals to power generators, regulators, governments and investors and this can in turn drive down power costs and boost economic competitiveness.

Existing policy recognises the importance of driving RE procurement on the part of large electricity consumers, as evidenced by the Renewable Purchase Obligation (RPO) mechanism. India has set state-wise targets for Renewable Purchase Obligation for DISCOMS and large electricity consumers.⁷ Companies in the heavy industry sector are large electricity consumers, and as a result are obligated to meet a certain share of their electricity from renewable energy.

TABLE 1
Renewable Purchase
Obligation targets

Year	Wind RPO	HPO	Other RPO	Total RPO
2022–23	0.81%	0.35%	23.44%	24.61%
2023–24	1.60%	0.66%	24.81%	27.08%
2024–25	2.46%	1.08%	26.37%	29.91%
2025–26	3.36%	1.48%	28.17%	33.01%
2026–27	4.29%	1.80%	29.86%	35.95%
2027–28	5.23%	2.15%	31.43%	38.81%
2028–29	6.16%	2.51%	32.69%	41.36%
2029–30	6.94%	2.82%	33.57%	43.33%



For the year 2022–23, the RPO target was 24.61%. Very few companies considered in this analysis have met this target:

- Only four companies (13%) have their share of renewable electricity in overall energy consumption greater than 24.61%
- Eleven companies (34%) have their share of renewable electricity in overall electricity consumption greater than 24.61%

Clearly, there is little pressure or enforcement of the RPO mechanism on large industrial consumers.

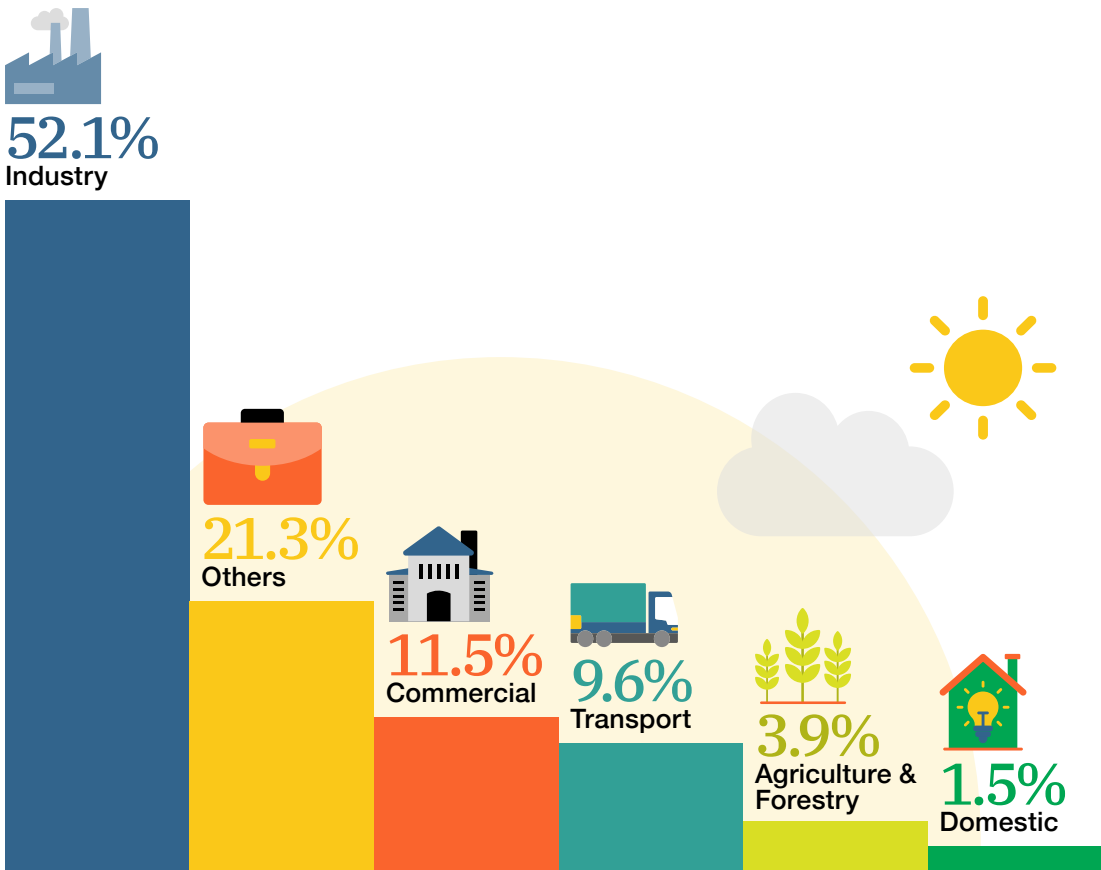


FIGURE 10
Share of energy consumption by economic sector⁸

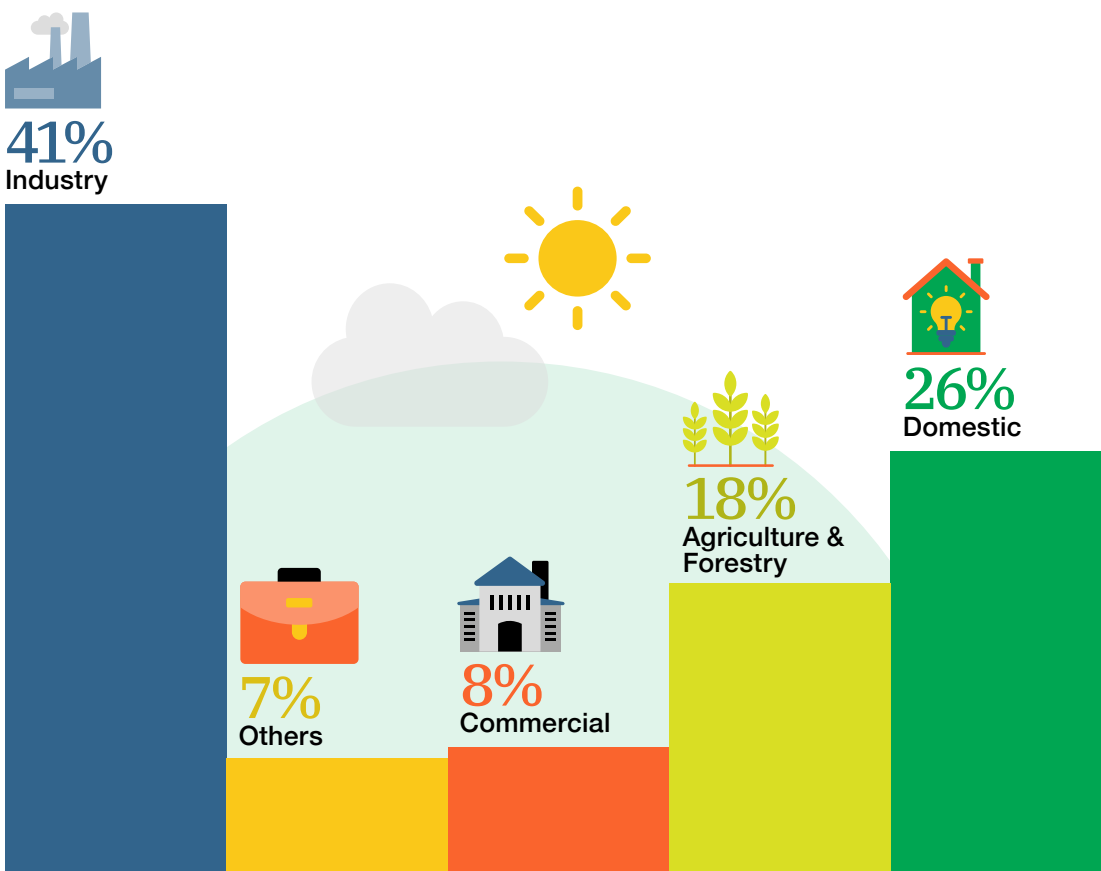
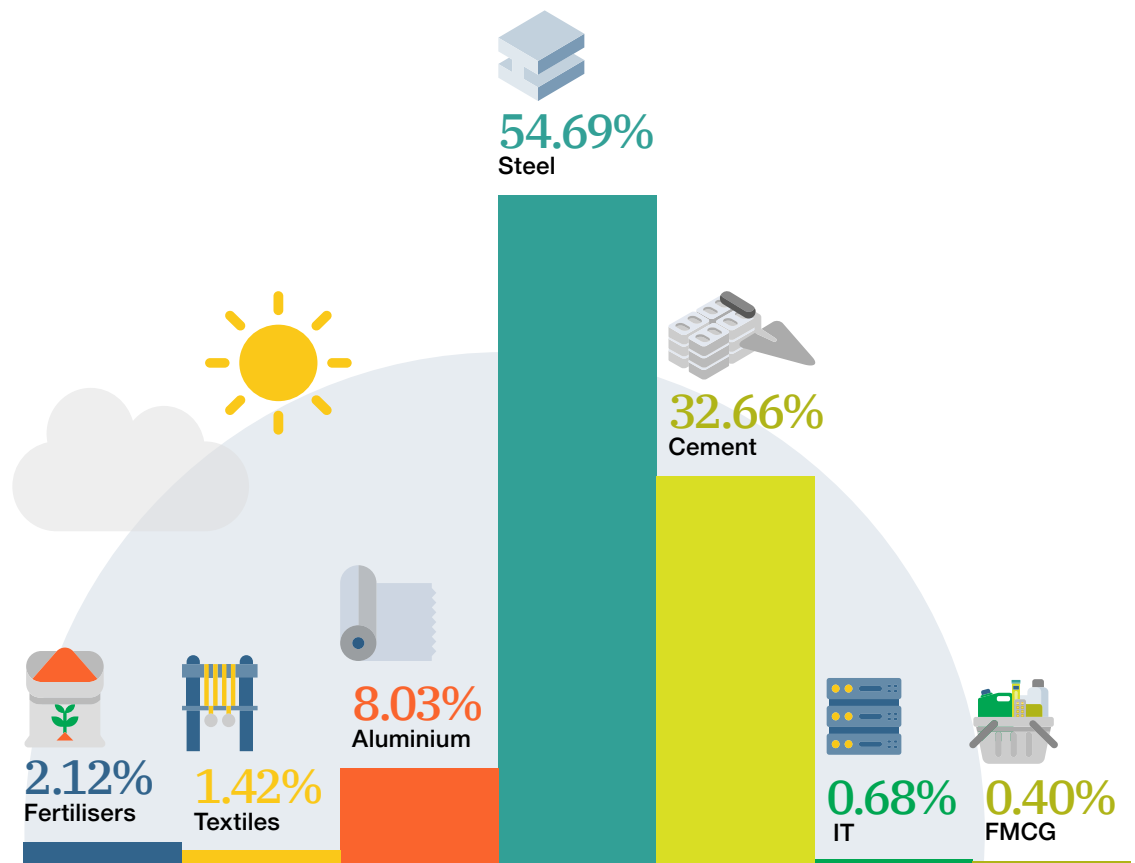


FIGURE 11
Share of electricity consumption by economic sector⁹

FIGURE 12
Share of electricity
consumption of
assessed companies by
sector



Source: Authors' analysis

We examine companies in five energy intensive industries: cement, steel, aluminium, textiles and fertilisers, along with the IT industry and FMCG industry. Because the nature of the energy demand of the latter two, it is easier for them to transition to a renewable energy mix in a shorter time span, even as low carbon solutions for heavy industry are developed.

This analysis aims to:

- Identify industries with a higher potential to transition to renewable energy
- Make a holistic comparison of leading companies in these industries in terms of their use of renewable energy, in order to identify leaders and those with the potential to do more
- Assess RE targets made by leading companies and progress towards meeting them

3.0

Methodology

This analysis relies on data collected from publicly available sources such as annual reports, business responsibility and sustainability (BRS) reports, sustainability reports, etc., published by companies for the financial year 2022–23. As there is no standard format in which these numbers are reported, it is necessary to view the data holistically. To assess the decarbonisation efforts of each company, the following four dimensions were considered with a total of 10 metrics across the four dimensions:

1. Reporting & Transparency
2. Sourcing
3. Intentions
4. Practising

While the dimensions Reporting & Transparency, Sourcing, and Intentions are qualitative, the Practising dimension is quantitative. Based on the data collected, scores are assigned to each metric, which are then weighted to get the dimension level scores for each company. These scores are then averaged to get an industry level score.

3.1 Dimension 1—Reporting & Transparency

Reporting a company's energy consumption in its annual report is an important leadership indicator. This transparency is essential to measure the current impact of the company. BRS reporting is now mandatory for all large companies, but not all companies report their energy consumption. Reporting energy consumption and the sources of that energy should be the norm, but that is not the case. This analysis scores companies on the basis of whether or not they report the following metrics:

1. Annual energy consumption (*1 point if reported, 0 if not*)
2. Annual electricity consumption (*1 point if reported, 0 if not*)
3. Electricity consumption from renewable sources (*3 points if reported, 0 if not*)

3.2 Dimension 2—Sourcing

Companies today have many options to source renewable electricity, from building their own RE capacity to entering into RE PPAs. This dimension is used to measure the extent to which companies are utilising available renewable electricity sources. Companies are scored on the basis of the following:

1. Captive RE is a part of energy mix
(2 points if yes, 0 if not)
2. RE PPAs are part of energy mix
(2 points if yes, 0 if not)
3. RECs are part of energy mix *(1 point if yes, 0 if not)*

Offsetting emissions via RECs can be problematic and is not the best way to reduce energy emissions. However, given the historical role that RECs have played in stimulating the RE industry in India, this analysis does credit REC purchases. Additionally, companies which do not currently have a major share of electricity in their total energy demand can use RECs to offset emissions until they are able to change to lower carbon production processes.

3.3 Dimension 3—Intentions

All companies need a plan to ensure sustainability; this is even more critical for large companies that have significant emissions and impact on the climate. This dimension measures the company's planning towards becoming more reliant on renewable electricity.

Companies are scored on the basis of the following criteria:

1. Captive RE in development/in planning
(1 point if yes, 0 if not)
2. A target for 100% RE deployment
(companies are scored from 0 to 4)
 - a. Companies that have already set a target year for 100% renewable energy before 2030 are given a score of 4
 - b. Companies that are members of initiatives such as RE100, SBTi (Science Based Targets initiative), etc. are given a score of 4
 - c. Companies that are in the process of becoming members of initiatives such as RE100, SBTi etc. are given a score of 3
 - d. Companies that either have an interim target (e.g., 30% RE by 2030), or have a target for 100% renewable energy post 2030 are rated subjectively on a scale of 0.5 to 3.5, based on both their percentage of RE and the proximity of their target year to 2030
 - e. Companies with ambiguous targets (without specific share and/or target year) are given a maximum of 1 point

3.4 Dimension 4—Practising

The three dimensions of Reporting & Transparency, Sourcing and Intentions help us understand the company's RE stance in a qualitative way. However, assessing quantitatively the actual performance of the company when it comes to clean energy is the most critical—what is the management actually doing to transition to clean energy?

Using two metrics, viz. share of RE in overall energy, and share of RE in electricity consumption, a weighted average is created that rates the company on the scale of

0 to 5. This dimension measures how companies are utilising RE to meet their energy requirements.

Metric	Maximum score
Share of RE in overall energy consumption	3
Share of RE in overall electricity consumption	2

TABLE 2
Metrics in Practising dimension



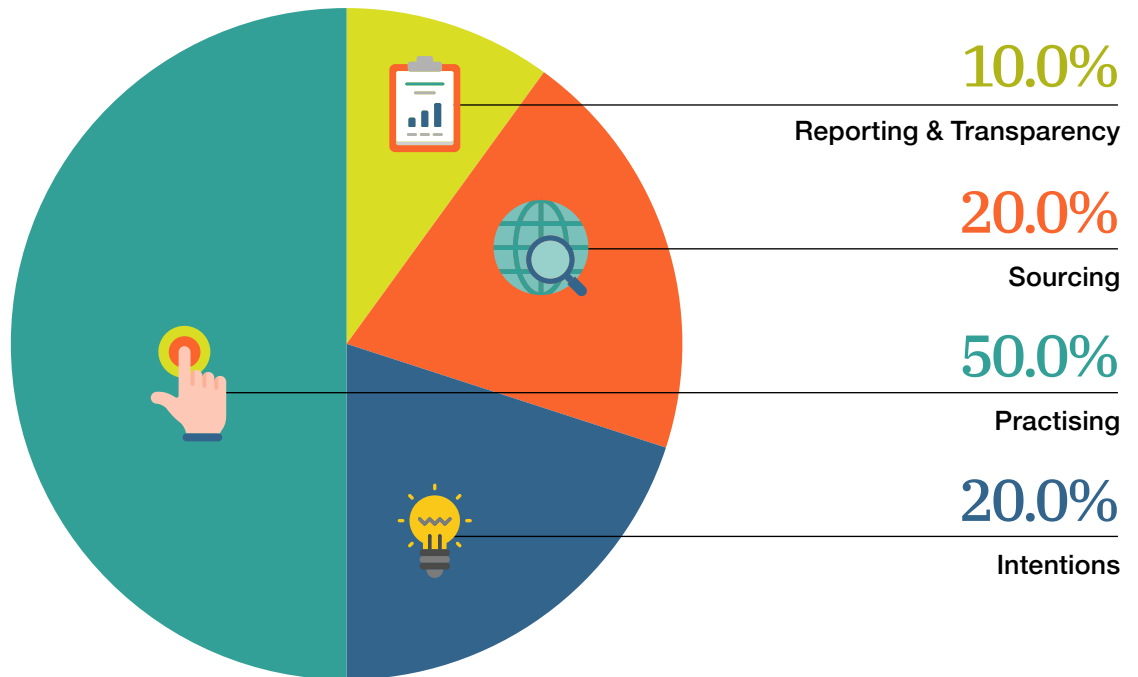
3.5 Overall Score

Using the four dimensions mentioned above, an overall (weighted) score is calculated.

Reporting is the bare minimum a company can do and so we assign a weight of 1 to the Reporting & Transparency dimension.

Sourcing and Intentions dimensions get a weight of 2 each. As actions matter the most, the Practising dimension gets the highest weight of 5. The overall score ranges from 0 to 5.

FIGURE 13
Weight of dimensions
for overall score



Source: Authors' analysis

Different industries use energy in different forms. Companies in the IT industry predominantly consume electricity, and utilise fossil fuels (such as diesel) mainly to run backup generators during power outages. In contrast, energy intensive industries such as cement or steel need energy in the form of heat and rely to a large extent on raw coal. In order to effectively account for these differences in energy requirements, we have bucketed companies into three groups. Each group has been assigned a target RE share as a percentage of its total energy consumption. Any company that has achieved or surpassed the target gets a maximum score on the 'Share of RE in overall energy consumption' metric (under the Practising dimension). Companies that have achieved a lower share are graded relative to their assigned target RE share.

Group 1

Companies in steel, aluminium and cement are bucketed in Group 1. The share of actual electricity consumption in overall energy consumption for the companies in Group 1 ranges from 1% to 50%. However, for the majority of the companies (70%), the share of electricity is currently between 2% to 20%. Ensuring all electricity consumption is RE-sourced is a basic minimum, even as the more difficult issue of decarbonising production processes is tackled. Since meeting all current electricity consumption via RE will be feasible within a relatively short time frame of 2–3 years, this analysis assigns Group 1 an RE Share target of 20%—that is, 20% of total energy consumption should be from RE.

Group 2

Companies in fertilisers, textiles and FMCG industries are bucketed in Group 2. The share of electricity in overall energy consumption for these companies in Group 2 ranges from 2% to 41%. However, for the majority of the companies (67%), the share of electricity is between 18% to 41%. Again, meeting all current electricity consumption via RE is feasible within a short time frame of 2–3 years, and hence this analysis assigns Group 2 an RE Share target of 40%—that is, 40% of total energy consumption should be from RE.

Group 3

Group 3 has only one member in it—the IT industry. Almost all of this industry’s energy requirements are met by electricity. On an average, 95% of the energy consumed by the assessed companies is via electricity. In theory, all the energy requirements for these companies can be catered to by electricity. As a result, Group 3 has been assigned an RE Share target of 100%. All energy consumption should be from RE.



3.6 Explanation of Units

Most industries use a mix of electricity and thermal energy, to cater to their energy requirements, and usually report them in Terajoules (TJ) or Petajoules (PJ). As the analysis focuses on renewable electricity, for the sake of comparison as well as ease of understanding, this report converts the reported joules to kWh (usually termed as a ‘unit’), and presents it in MU (Million Units) or BU (Billion Units).

- **1 TJ = 2.778 x 10⁵ kWh**
- **1 PJ = 2.778 x 10⁸ kWh**

4.0

Results

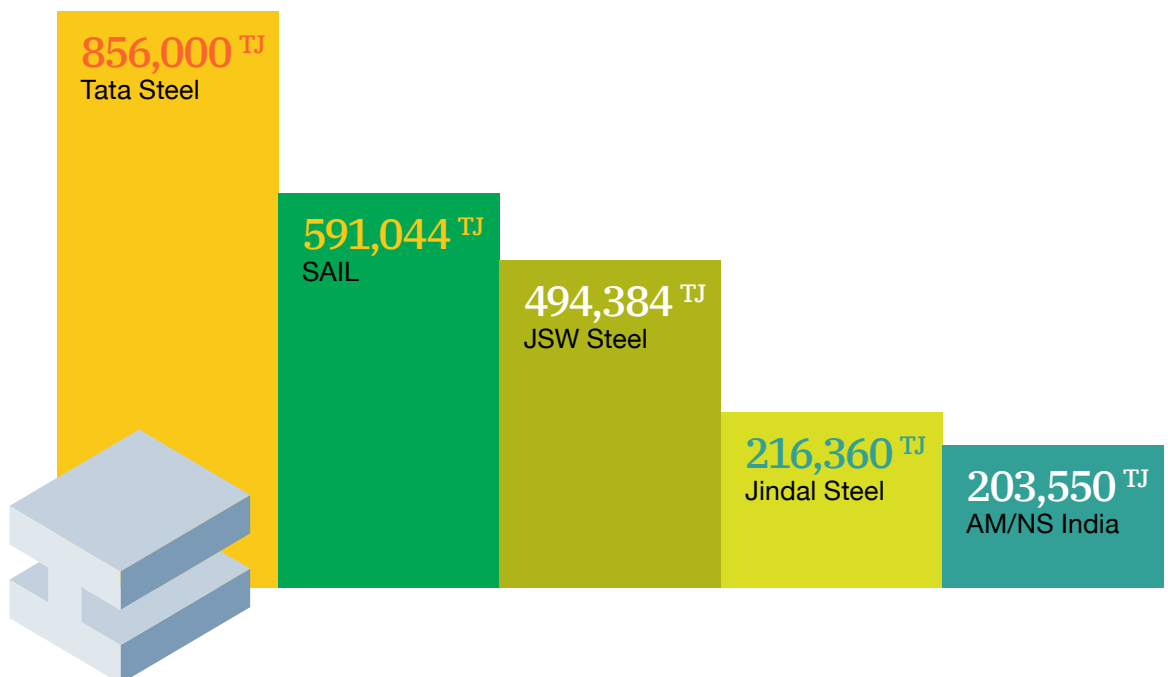
4.1 The Steel Industry

India was the second largest producer of crude steel, producing over 118 MT in 2021.¹⁰ The steel industry is one of the top consumers of energy in India, with more than 75% of the steel produced in conventional ways, requiring either coal or lignite. This makes the steel industry highly energy intensive, and heavily reliant on fossil fuels. At the same time, by virtue of its size, the steel industry also consumes a large amount of electricity. The five companies assessed

in this analysis consumed about 656 BU (2,158 PJ) of energy in 2022–23. Of which, about 94 BU (337 PJ) was from electricity.

This analysis considers five companies in the steel industry, viz. TATA Steel,¹¹ SAIL,¹² Jindal Steel,¹³ JSW Steel,¹⁴ AM/NS,¹⁵ based on their annual steel production numbers. This analysis buckets the Steel Industry in Group 1, hence each company's actual share of renewable electricity is rated against the assigned target of 20%.

FIGURE 14
Overall energy consumption among steel companies assessed (2022–23, terajoules)



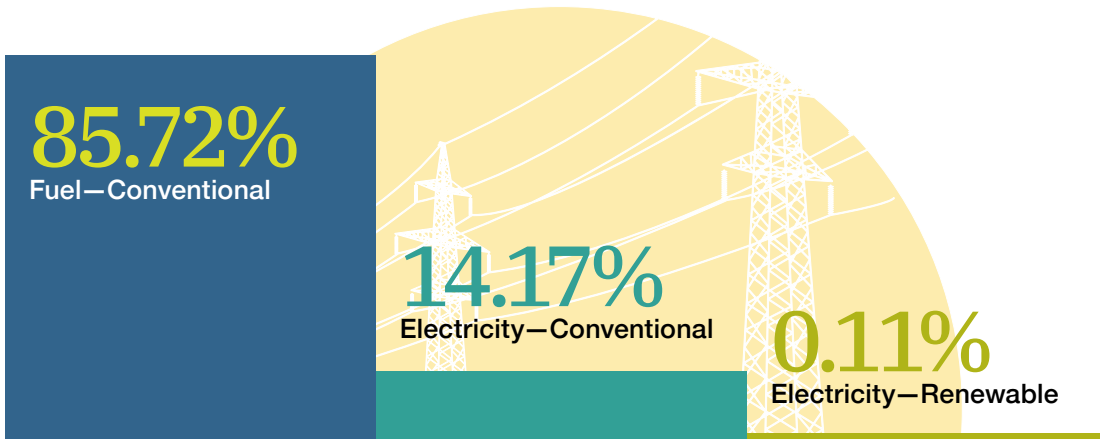


FIGURE 15
Energy consumption
by source: steel
companies (2022–23)

Electricity accounts for 14% of the total energy consumption of these five companies, and only 0.11% of the total energy consumption comes from renewable electricity, making the steel industry the lowest performer in this respect. Four out of the five companies assessed have scored a perfect 5 on the Reporting & Transparency dimension. Majority of the companies have either captive RE (in varying capacities), or have PPAs to source RE. As a result, the steel industry scores a decent 3.6 on the Sourcing dimension. Except for Jindal, companies have public plans to build new RE capacity. While TATA and JSW have their targets aligned with Science Based Targets Initiative (SBTi),

SAIL and Jindal have set minor goals in achieving more RE share in their energy consumption. The steel industry scores 3.2 on the Intentions dimension.

However, while most companies have either PPAs or captive RE installations in place, the quantum of renewable electricity consumed is minuscule. For this reason, the steel industry scores an insignificant 0.06 out of 5 on the Practising dimension, with 3 out of the 5 companies scoring zero. All together, the steel industry gets an overall score of 1.81 out of 5.

	Reporting	Sourcing	Intentions	Practising	Overall
Tata	5	4	5	0.05	2.33
Jindal	5	4	1	0	1.50
SAIL	5	2	3	0	1.50
JSW	5	4	5	0.27	2.44
AM/NS	1	4	2	0	1.30
Average Score	4.20	3.60	3.20	0.01	1.79

FIGURE 16
Steel industry scores

4.2 The Cement Industry

In 2022, India was the second largest producer of cement in the world, with a production of 370 million MT (metric tonnes) in that year.¹⁶ The cement industry is responsible for 8% of India’s GHG emissions.¹⁷ This analysis considers the following companies: Ambuja Cement,¹⁸ ACC Ltd.,¹⁹ Shree Cement,²⁰ Dalmia Cement,²¹ and UltraTech Cement.²² All together, these companies consumed around 216 BU (778 PJ)

of energy in 2022–23. Electricity accounted for about 26% of the energy consumed by these companies. However, only 2.5% of their energy demand, equivalent to 5 BU, was met from renewable electricity.

This analysis groups the Cement industry in Group 1, hence the share of renewable electricity is rated against an assigned target of 20%.

FIGURE 17
Overall energy consumption among cement companies assessed (2022–23, terajoules)

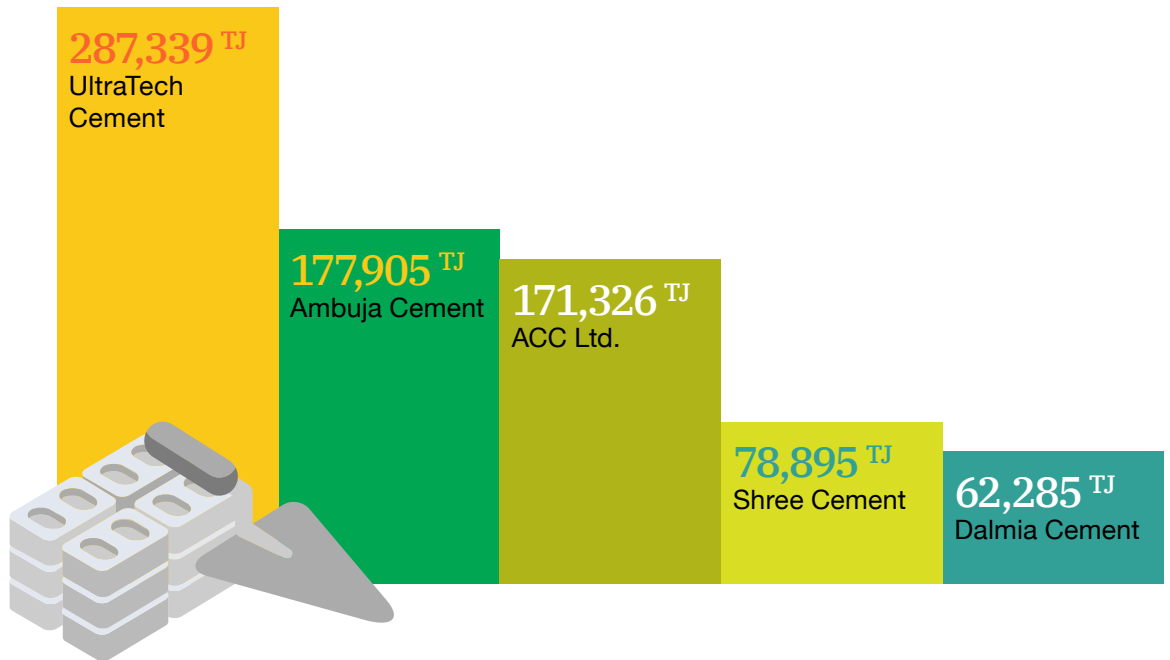
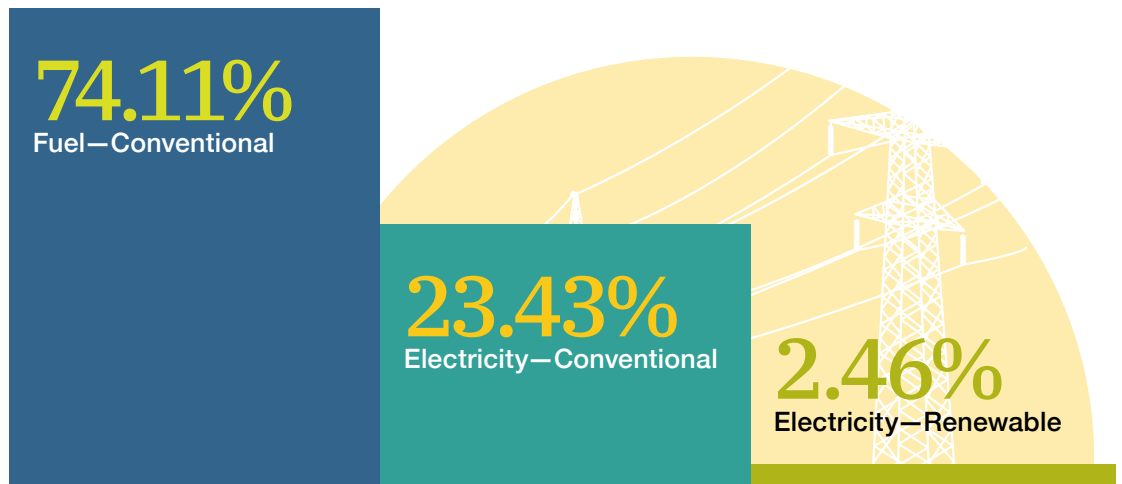


FIGURE 18
Energy consumption by source: cement companies (2022–23)



All the five companies considered for the analysis have reported their energy consumption, as well as the sources of energy, thus scoring 5 on the Reporting & Transparency dimension. While most of the assessed companies do not leverage PPAs to source RE, or use RECs to offset emissions, all of them have captive RE in varying capacities. As a result, the cement industry scored 2.4 on the Sourcing dimension. All the five assessed companies are either a member of SBTi, or have their targets aligned with SBTi, and have plans

in place to develop new renewable energy capacity.

As a result, they score 5 on Intentions. However, on the Practising dimension, the cement industry scores very low. With only 2 of the 5 companies scoring above 1 (Shree Cement and Dalmia Cement), the industry scores 0.95 on the Practising dimension. Overall, the cement industry scores 2.45 out of 5.

	Reporting	Sourcing	Intentions	Practising	Overall
Ambuja Cement	5	3	5	0.71	2.46
Shree Cement	5	2	5	1.76	2.78
ACC Cement	5	3	5	0.61	2.41
UltraTech Cement	5	2	5	0.40	2.10
Dalmia Cement	5	2	5	1.25	2.53
Average Score	5	2.40	5	0.95	2.45

FIGURE 19
Cement industry scores

4.3 The Aluminium Industry

China dominates the world in terms of aluminium production, followed by India, even though India accounted for just a tenth of China’s production in 2022.²³ India’s aluminium industry is dominated by three companies viz. BALCO,²⁴ HINDALCO,²⁵ and NALCO.²⁶ Together, these companies consumed about 194 BU (700 PJ) of energy in 2022–23, according to company reports. Majority of the energy consumed by these

three companies is through coal or Heavy Fuel Oil (HFO), with 7% of the energy consumption coming from electricity. Only 0.8% of the overall energy consumption (or 11% of all electricity consumption), equivalent to 1.6 BU, is from renewable electricity.

This analysis groups the aluminium industry in Group 1, hence the share of renewable electricity is rated against an assigned target of 20%.

FIGURE 20
Overall energy consumption among aluminium companies assessed (2022–23, terajoules)

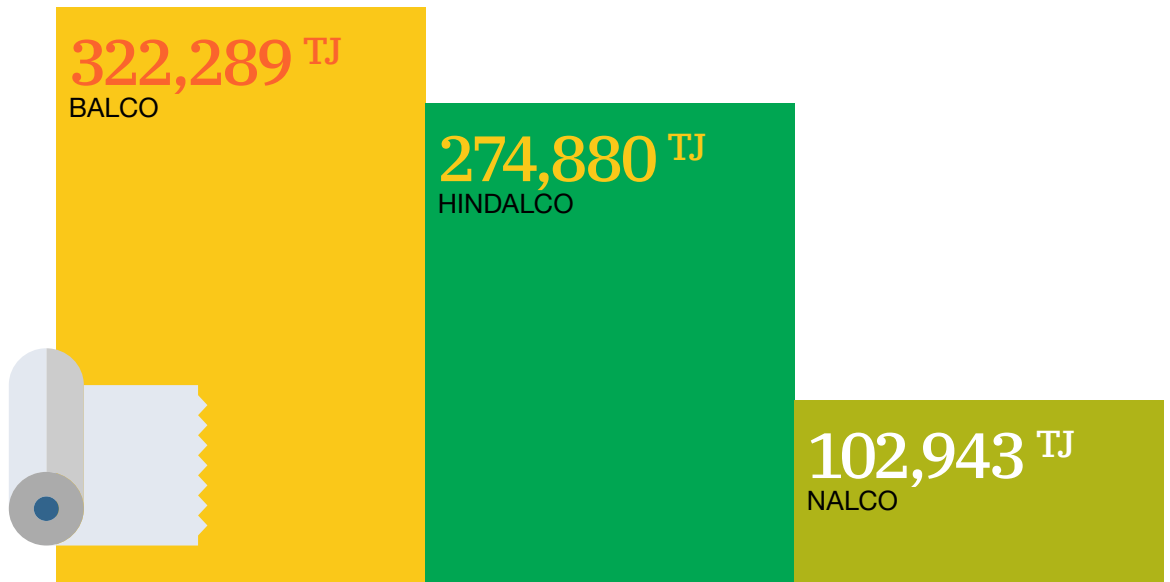
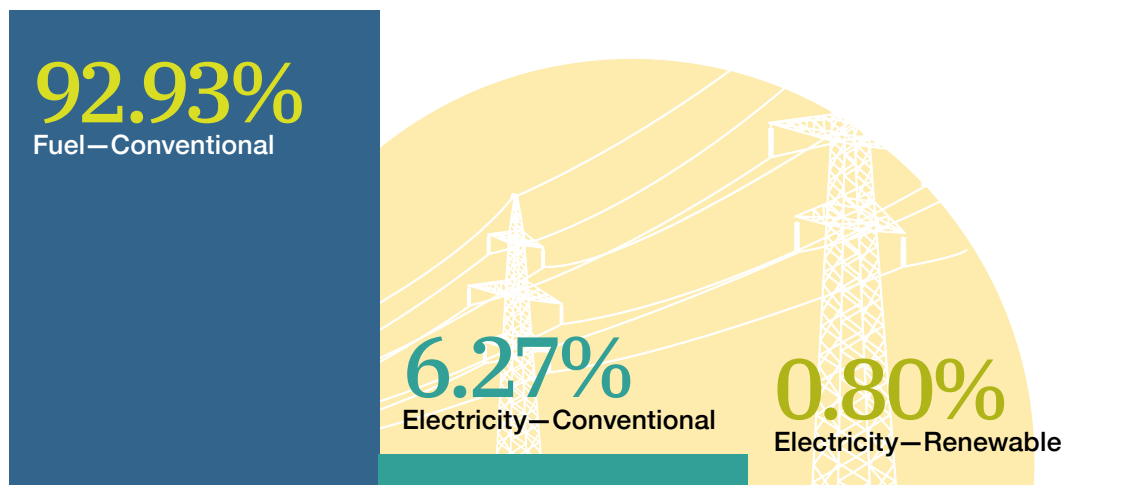


FIGURE 21
Energy consumption by source: aluminium companies (2022–23)



All three companies report their overall energy consumption, as well as the source of the energy, scoring 5 on the Reporting & Transparency dimension. On the Sourcing dimension, the aluminium industry scores 3. Only BALCO has set a target to achieve any share of RE. Though the annual report of BALCO does not mention any such target, Vedanta as a whole has set a

target of 30% RE mix by 2030, for which they were awarded 2 points. They score 1.7 on the Intentions dimension. On the Practising dimension these companies perform very similarly to the other two industries in Group 1, scoring a meagre 0.30. All together, the Aluminium industry gets a score of 1.59 out of 5.

	Reporting	Sourcing	Intentions	Practising	Overall
HINDALCO	5	2	1	0.45	1.33
BALCO	5	3	3	0.46	1.93
NALCO	5	4	1	0	1.50
Average Score	5	3	1.70	0.30	1.59

FIGURE 22
Aluminium industry scores

4.4 The Textile Industry

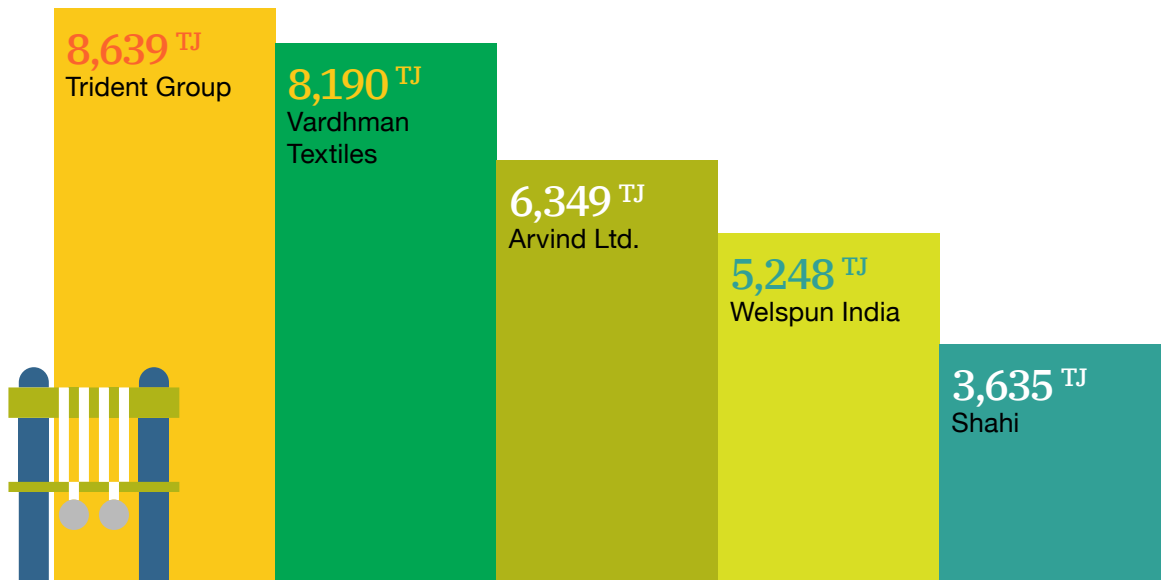
In 2021, India exported \$22 billion worth of textiles,²⁷ the third highest volume internationally. The textile industry is also a major employer, providing over 45 million direct jobs and over 100 million opportunities in allied sectors.²⁸

The analysis considers the following companies: Trident Group,²⁹ Arvind Ltd.,³⁰ Welspun India,³¹ Shahi³² and Vardhman

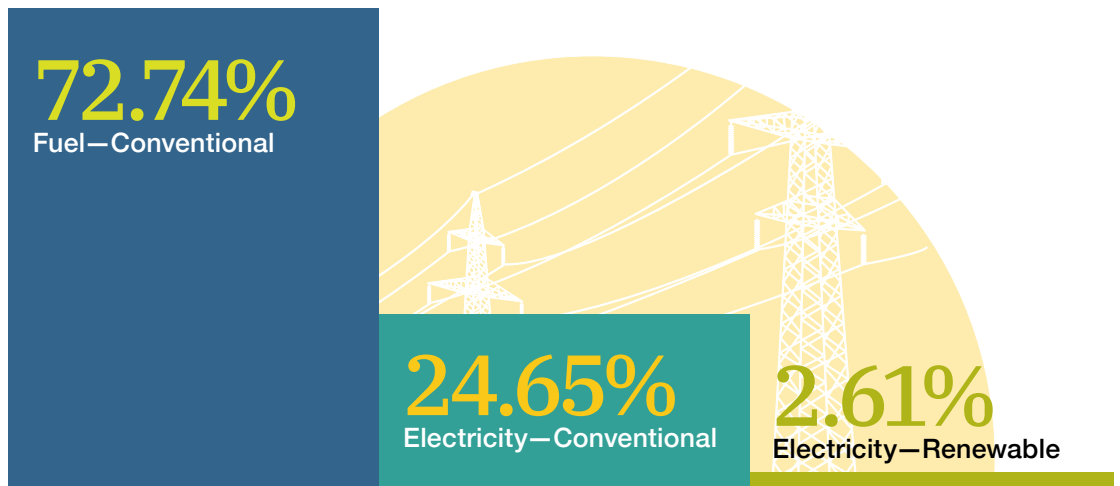
Textiles.³³ These companies consumed around 8.9 BU (32 PJ) of energy in 2022–23. About 27% of the energy consumption comes from electricity, with the majority coming from conventional electricity. Less than 3% of the total energy consumption, equivalent to 0.23 BU (0.8 PJ), is sourced from renewable electricity. This analysis groups the textile industry in Group 2, hence the share of renewable electricity is rated against an assigned target of 40%.

FIGURE 23

Overall energy consumption among textile companies assessed (2022–23, terajoules)

**FIGURE 24**

Energy consumption by source: textile companies (2022–23)



In the textile industry, all the companies considered for the analysis scored 5 on the Reporting & Transparency dimension. Companies either had PPAs or captive RE, but not both. As a result, the textile industry scores a moderate 2.4 on the Sourcing dimension. Except Vardhman, all the companies have either set a target for achieving 100% RE in their electricity consumption, or have their targets aligned

with SBTi. As a result, the textile industry scores 4 out of 5 on the Intentions dimension. Shahi, with a high share of RE in its electricity consumption (at 70%), scores well above 2 on the Practising dimension while the rest score below 0.5. As a result, the industry scores a low 0.63 out of 5 on the Practising dimension. Overall, the textile industry scores just above 2 out of 5.



	Reporting	Sourcing	Intentions	Practising	Overall
Arvind Ltd.	5	2	4	0.45	1.93
Vardhman Textiles	5	2	1	0.14	1.17
Welspun India	5	2	5	0	1.90
Shahi	5	2	5	2.45	3.13
Trident Group	5	4	5	0.12	2.36
Average Score	5	2.40	4	0.63	2.10

FIGURE 25
Textile industry scores

4.5 The Fertiliser Industry

India stands fourth among the world’s major global fertiliser suppliers.³⁴ In 2022, India was estimated to produce about 42 Million MT of fertiliser.³⁵ For the analysis, the following companies were considered: National Fertilizers,³⁶ Chambal Fertilisers & Chemicals,³⁷ Coromandel International,³⁸ Rashtriya Chemicals and Fertilizers,³⁹ and Gujarat State Fertilizers and Chemicals.⁴⁰ These companies consumed around 47 BU (170 PJ) of energy in 2022–23. About 8%

of the energy consumption comes from electricity, with the majority of it coming from conventional electricity. Less than 0.5% of the total energy consumption, equivalent to 0.23 BU (0.8 PJ), is sourced from renewable electricity.

This analysis groups the fertiliser industry in Group 2, hence the share of renewable electricity is rated against an assigned target of 40%.

FIGURE 26
Overall energy consumption among fertiliser companies assessed (2022–23, terajoules)

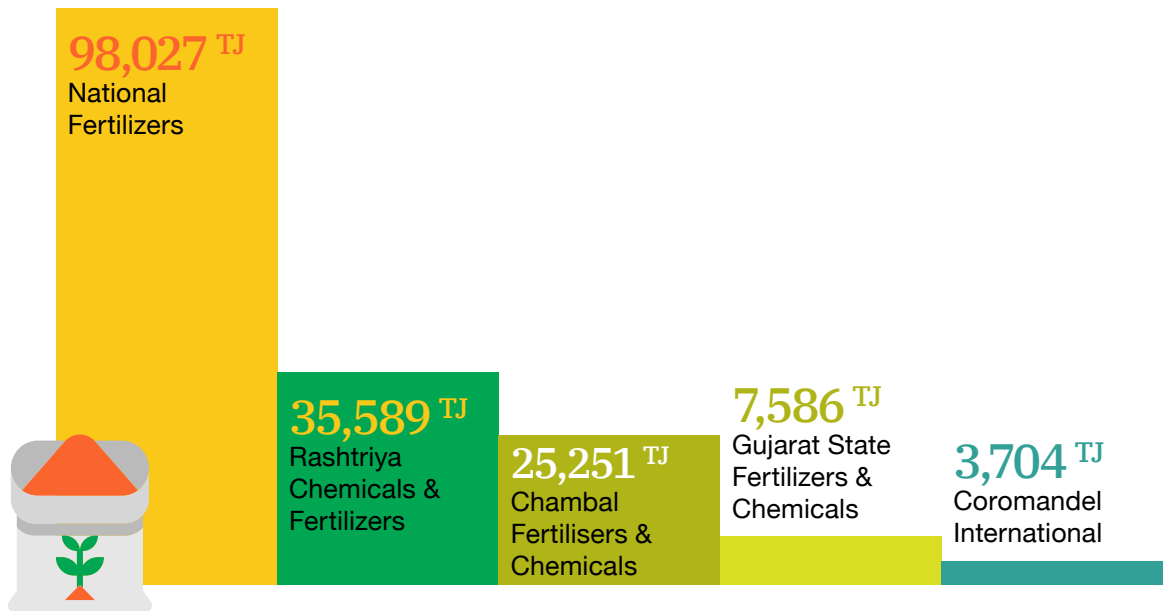
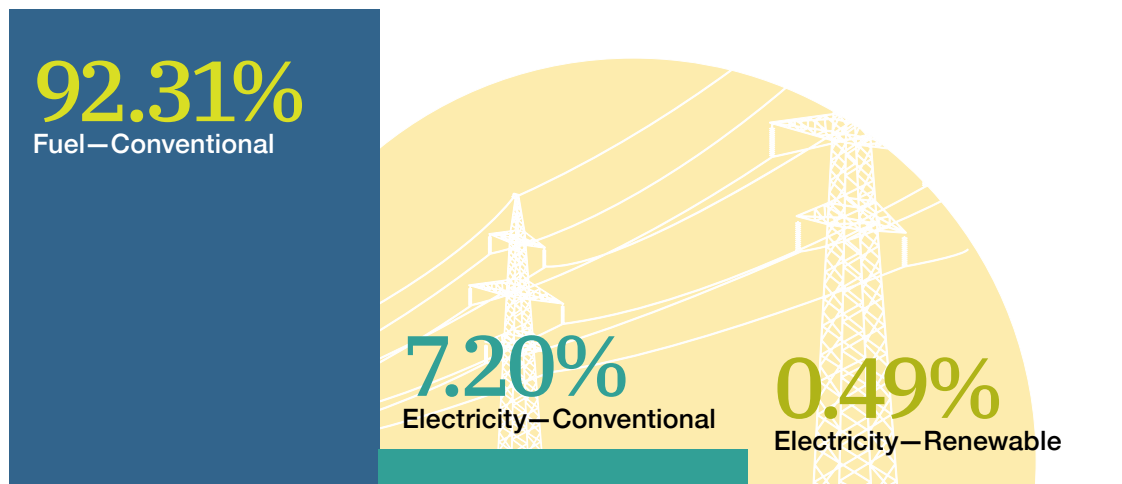


FIGURE 27
Energy consumption by source: fertiliser companies (2022–23)



The fertiliser industry scores 5 on the Reporting & Transparency dimension. However, the industry scores consistently low on the other three dimensions. It scored 0.8 on the Sourcing dimension. Chambal Fertilisers is the only company (among the assessed) to have set a target for renewable electricity adoption. Though ambiguous on the deadline, the company is planning to increase the share of renewable electricity in overall electricity consumption

by 10%. Rest of the companies do not mention any targets related to RE adoption. As a result, the fertiliser industry scores only 0.90 on the Intentions dimension, least among all the industries considered for the analysis. With four out of five companies having insignificant shares of RE in their overall energy consumption, it scores a meagre 0.32 on the Practising dimension. Overall, the fertiliser industry gets a score of 1 out of 5.

	Reporting	Sourcing	Intentions	Practising	Overall
Coromandel International	5	0	0.5	0.07	0.64
Chambal Fertilisers	5	0	2	0	0.90
National Fertilizers	5	0	1	0	0.70
Rashtriya Chemicals & Fertilizers	5	2	0	0.03	0.92
Gujarat State Fertilizers & Chemicals	5	2	1	1.51	1.86
Average Score	5	0.80	0.90	0.32	1.00

FIGURE 28
Fertiliser industry scores

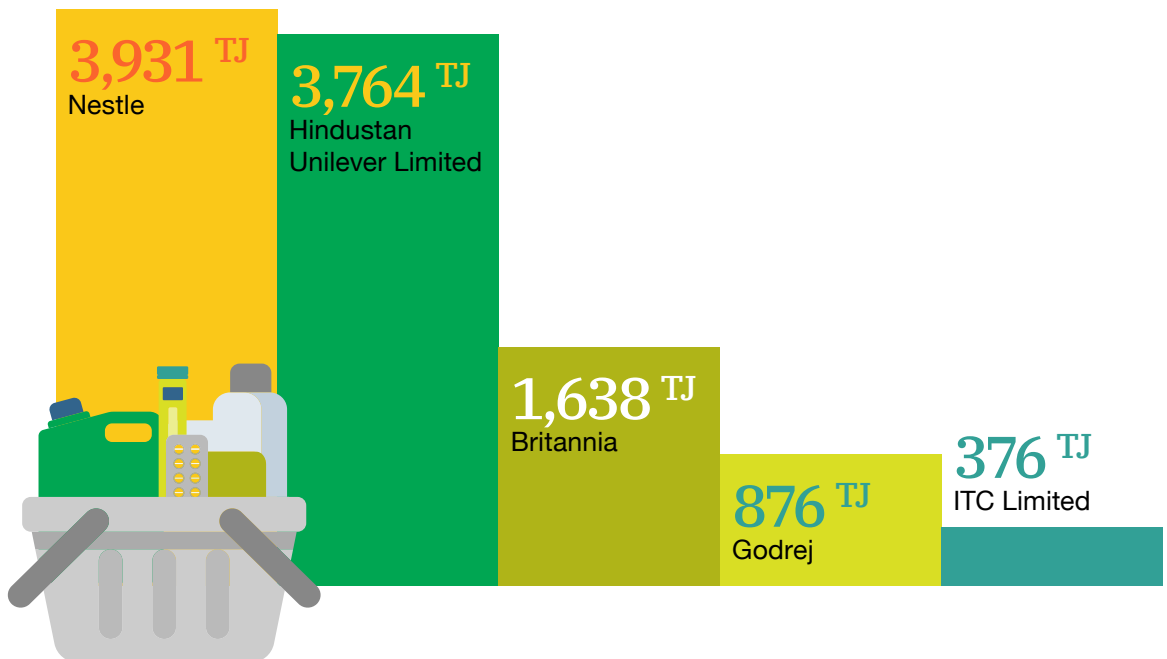
4.6 The FMCG Industry

The FMCG industry is a major contributor to the Indian economy. Since 2011, the market size of FMCG has increased at a CAGR of 14.87%, reaching \$110 billion in 2021. With a notable growth trajectory, it is anticipated to reach \$615 billion by 2027,⁴¹ making it a compelling area of analysis for energy transition. The following companies were considered for this analysis: Nestle,⁴² Hindustan Unilever Limited (HUL),⁴³ Godrej,⁴⁴ Britannia⁴⁵, and ITC Limited.⁴⁶ These companies had a combined annual energy consumption of about 2.9 BU (10.6 PJ) in 2022–23. Close to 23% of the combined energy consumption comes from electricity. Renewable electricity constitutes about 19% of the total energy consumption, or about 83% of electricity consumption, equivalent to 0.6 BU. This can be attributed to the high renewable electricity share achieved by HUL and Nestle.

Through a combination of Solar PV, wind, and RECs, HUL reports a 100% renewable share in its electricity consumption. However, renewable electricity constitutes only 33% of the total “renewable energy” consumed by HUL, the remaining 67% being derived from fuels (likely biomass). Similarly, Nestle too reports a 99% renewable electricity share in its electricity consumption. However, this renewable electricity constitutes only 57% of the overall “renewable energy” consumption by Nestle.

Apart from ensuring that all electricity consumption is met by pure RE (wind/solar), FMCG companies should also be looking to electrify their processes to reduce the use of fossil fuels or biomass for cooking and processing. Biomass is not a zero carbon fuel, and depending on source, can have significant environmental impacts.

FIGURE 29
Overall energy consumption among FMCG companies assessed (2022–23, terajoules)



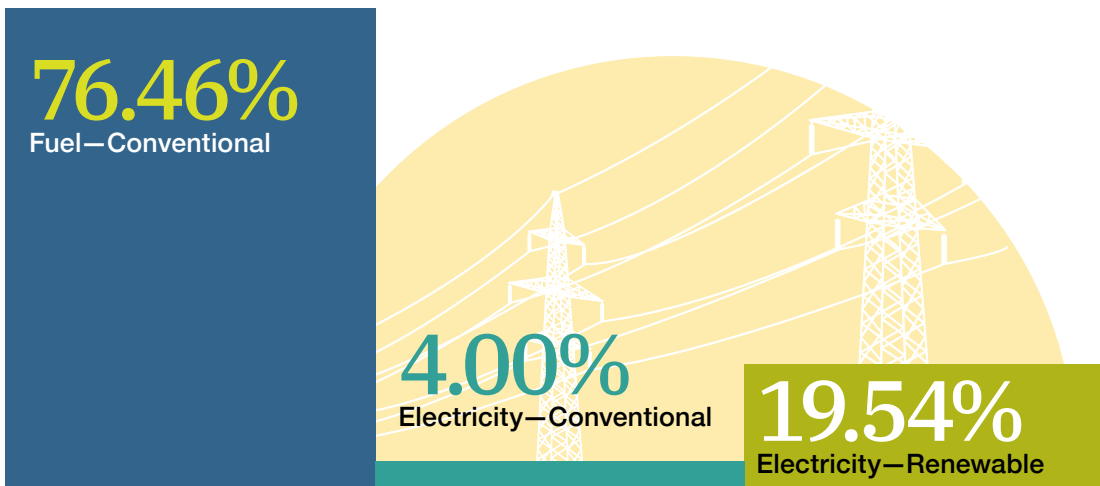


FIGURE 30

Energy consumption by source: FMCG companies (2022–23)

The FMCG industry scores 5 on the Reporting & Transparency dimension, and scores 2.6 on the Sourcing dimension. All companies assessed in the FMCG industry have plans to develop new RE capacity, and most of them have set targets to achieve some level of RE adoption in the coming years. As a result, the FMCG industry scored 3.6 on the Intentions dimension. FMCG is among the only two industries to break the 2-point barrier on the Practising dimension. With Nestle

managing a 99% share of RE in electricity consumption, and HUL achieving a 100% share of RE in electricity, they push the FMCG industry to achieve 2.13 on the Practising dimension, highest among all the industries analysed. Overall, the FMCG industry gets a score of 2.8 out of 5. Just like the IT industry, the FMCG industry has processes that more easily lend themselves to total electrification (and therefore 100% RE) and as such, should be expected to perform better in this regard.

	Reporting	Sourcing	Intentions	Practising	Overall
Godrej	5	2	5	0.48	2.14
Nestle	5	3	1	3.43	3.02
ITC Limited	5	3	4	1.22	2.51
Hindustan Unilever Limited	5	3	5	4.30	4.25
Britannia	5	2	3	1.20	2.10
Average Score	5	2.60	3.60	2.13	2.80

FIGURE 31

FMCG industry scores

4.7 The IT Industry

The IT industry is not a major consumer of energy, compared to the other industrial sectors already discussed. However, it is a major contributor to India's GDP. As of 2022, the IT industry was responsible for generating 7.4% of the country's GDP. Given that the majority of this industry's energy consumption is electricity, it is an interesting sector to

analyse. The following companies were considered: TCS,⁴⁷ HCL Tech,⁴⁸ Infosys,⁴⁹ Wipro,⁵⁰ Tech Mahindra.⁵¹ These companies together consumed about 1.2 BU (4.4 PJ) of energy in 2022–23. About 95% of the energy comes from electricity. However, only 45% of this electricity, equivalent to 0.5 BU (1.9 PJ), is sourced from renewable electricity sources.

FIGURE 32
Overall energy consumption among IT companies assessed (2022–23, terajoules)

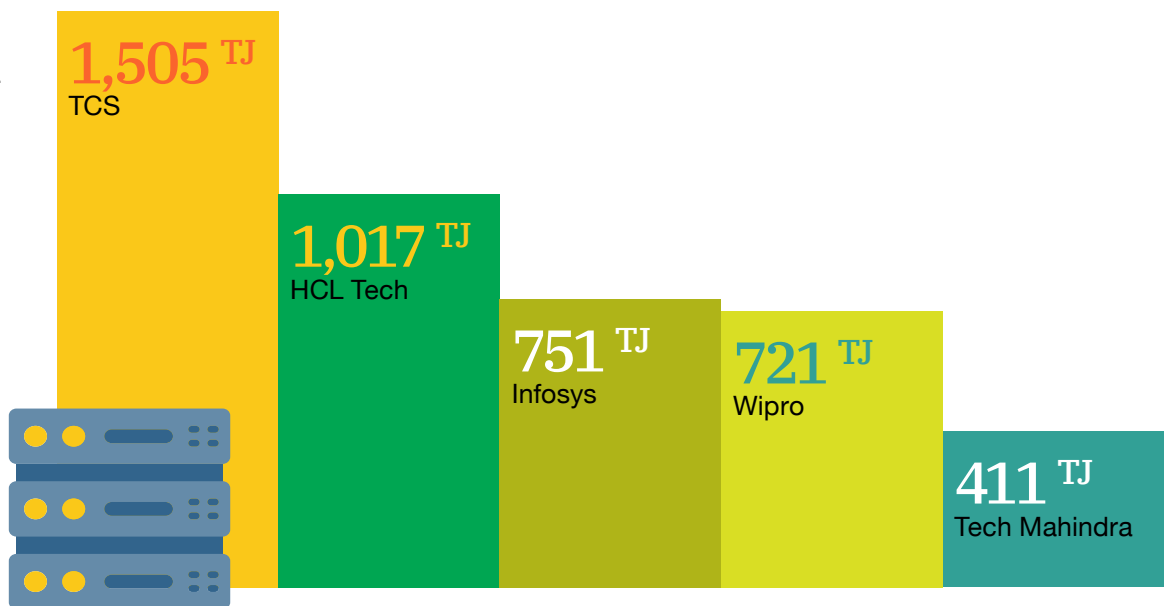
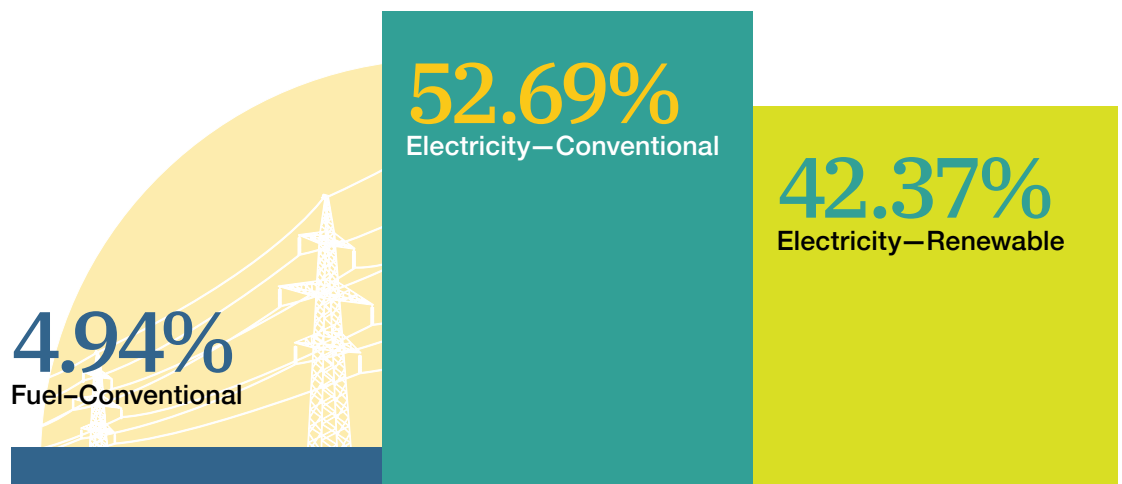


FIGURE 33
Energy consumption by source: IT companies (2022–23)



The IT industry is the best performing industry among those considered for this analysis. All the five IT companies analysed reported their overall energy consumption from different sources, scoring the maximum 5 on the Reporting & Transparency dimension. The companies also perform relatively well on the Sourcing and Intentions dimensions. The industry scores 3.4 on the Sourcing dimension, coming second only to the steel industry. All the assessed companies in this industry have their targets aligned with SBTi, and hence score well on the Intentions dimension. The IT

industry is rated against a 100% RE target (share of RE in energy consumption) and scores a decent 2.03 on the Practising dimension, second only to FMCG. However, given the relative ease by which the IT industry can transition to 100% RE, the industry should be expected to rapidly scale up its use of clean energy. Overall, the IT industry scored 3.08, becoming the best performing industry in the analysis. This industry can serve as model for other industries, acting as a catalyst for the necessary build out of RE in India.

	Reporting	Sourcing	Intentions	Practising	Overall
TCS	5	5	5	2.81	3.91
Infosys	5	4	4	2.45	3.32
HCL Tech	5	4	4	0.89	2.55
Wipro	5	2	4	2.91	3.16
Tech Mahindra	5	2	5	1.11	2.45
Average Score	5	3.4	4.4	2.03	3.08

FIGURE 34
IT industry scores

5.0

Observations

01 >>

The overall average for the Practising dimension is a dismal 0.96. This average drops to 0.47 if we exclude the FMCG and IT industries. About a third of the companies have scored 1 or higher on the Practising dimension. This shows that though the companies might have started to “talk the talk”, they have yet to “walk the walk”—their actions have yet to reflect their stated goals and intentions.

02 >>

The companies assessed in the study score an average of 4.9 on the Reporting & Transparency dimension. All the companies, except for AM/NS India, have reported their energy consumption figures from various sources (even if they are reporting them as 0), scoring 5 on this dimension. This shows

that companies understand the importance of reporting their energy consumption.

03 >>

Over 75% of the companies have captive RE (solar PV or wind) with varying capacities. Only about 22% of the companies leverage RECs to offset emissions.

04 >>

About 20% of the companies either lack an RE target or have not disclosed such a target. Majority of the companies have set a target to either achieve 100% RE, or to achieve a certain share of RE in the coming years. Most of these companies are part of the SBTi, an initiative established in 2015 to help companies set emission reduction targets in line with climate science and Paris Agreement goals.

05 >>

All the companies considered under the cement, steel, aluminium, textiles, and fertilisers industries together have a significant annual electricity consumption of 169 BU (billion units). However, only 8 BU of electricity was from renewable sources (excluding Waste Heat Recovery Systems (WHRS) and biomass), which constitutes less than 6% of the annual electricity consumption of these companies. There is a significant amount of electricity consumption that can be replaced by RE in a relatively short time frame.

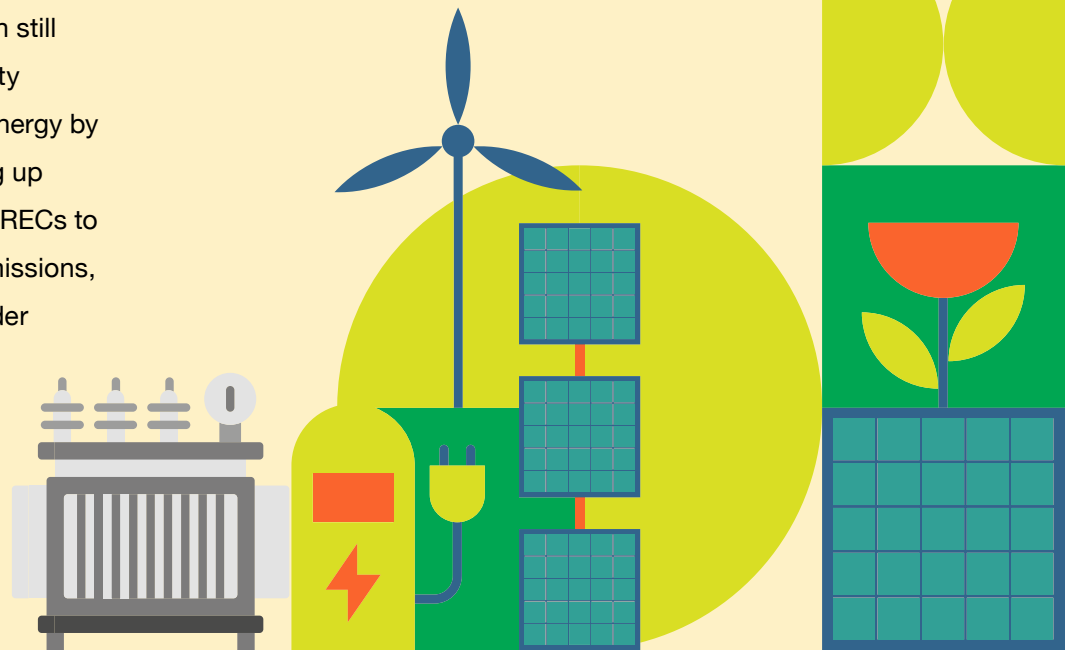
06 >>

Companies with lower use of electricity in their total energy consumption, for example, the cement and steel industries, are not immune from action. While green hydrogen and other low carbon processes are still in development and might take years before commercial viability, companies can still ensure that all their current electricity consumption is met by renewable energy by signing new RE PPAs and/or setting up captive RE. They can also leverage RECs to offset their direct energy-related emissions, and report the RECs separately under

renewable electricity. Though not in the same group as the cement and steel industry, HUL is an example of this. HUL reports 100% RE in its energy consumption via a combination of solar PV, wind and RECs.

07 >>

RECs are only a milestone on the road to 100% RE. RECs are not a one to one replacement for utilising renewable electricity. When companies purchase stand-alone RECs (just the certificate and not the energy), no actual emissions reduction occurs. Moreover, RECs are prone to double counting, so two companies might be claiming the utilisation of the same energy unit produced, without making any real change to their energy portfolio. Hence, RECs can only play a supporting role in achieving renewable electricity targets. Over the medium to long term, cement, steel, and similar industries need to lower their carbon intensity through progressive electrification and switching to greener processes.



08 >>

Waste Heat recovery is important, but it is not renewable energy. Companies which require a lot of energy in the form of heat often use WHRS as a way to extract more energy from the fuel used, and achieve higher efficiency. These companies also tend to consider and report the energy extracted via WHRS as renewable energy. Though WHRS has an important role to play in lowering emission intensity, it is not renewable by any definition. While companies are allowed to meet Renewable Purchase Obligation using WHRS, they should report energy from WHRS as a different source rather than bundling it with energy from renewable sources.

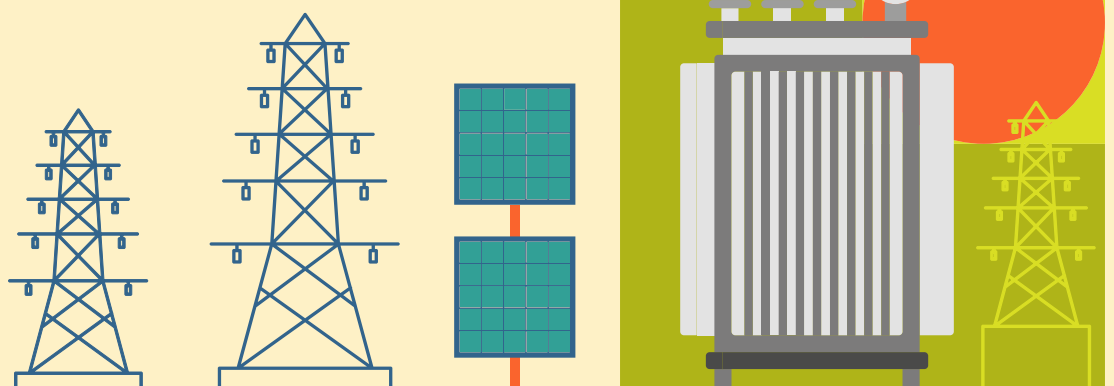
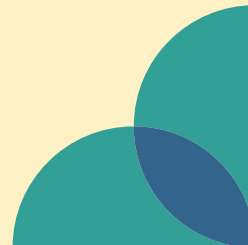
companies must try to utilise these mechanisms to their advantage. Corporate RE PPAs will also serve as a fillip to the domestic RE industry, as well as acting as a hedge against power price volatility.

10 >>

Companies that have a high share of electricity in their overall energy consumption have an easier path to 100% RE, with the major bottleneck being availability. These companies must progressively increase their share of renewable electricity with an aim to be 100% RE by 2030 on an hourly matching basis.

09 >>

RE PPAs should be the primary source of corporate decarbonisation. Only 14 of the 33 companies assessed mention RE PPAs as a way of sourcing renewable electricity. Given that corporate PPAs are becoming increasingly widespread with the advent of Green Energy Open Access regulations,⁵²



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Conclusion

Corporate action allied with progressive policies that are actually enforced will be crucial to decarbonisation. Policies that would require companies to rapidly increase the share of renewable electricity in their annual electricity demand with the ultimate goal of 100% renewable electricity can be transformative for India's energy transition. For example, the five companies in the steel industry considered for this analysis together consumed about 93,666 MU electricity in FY 2022–23. This was significantly more than the electricity demand of states such as Andhra Pradesh and West Bengal. Policies that push companies towards investing in more reliable renewable electricity will bolster the development of energy storage technologies, lowering costs further.

IV. Endnotes

1. www.yearbook.enerdata.net/total-energy/world-consumption-statistics.html
2. [www.enerdata.net/estore/energy-market/india/#:~:text=Total%20energy%20consumption%20continued%20to,%25\)%20and%20biomass%20\(21%25\)](http://www.enerdata.net/estore/energy-market/india/#:~:text=Total%20energy%20consumption%20continued%20to,%25)%20and%20biomass%20(21%25))
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