

A business case for Renewable Energy Certificates for Indian companies to meet RE100 targets



Acknowledgments

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Bridge To India is a leading consultancy and knowledge services provider in the Indian renewable energy market. The company aspires to enable innovative and viable clean energy solutions in India. Operational since 2009, they have a unique vantage point on the market dynamics, combining 360-degree view from their market intelligence and consulting businesses. They work on wide ranging consulting and research assignments with all industry stakeholders including technology companies and contractors, project developers and investors, financial institutions, government agencies, think-tanks and developmental institutions.




We Mean Business Coalition works with the world's most influential businesses to take action on climate change. The Coalition brings together a group of non-profit organizations to catalyze business and policy action to halve emissions by 2030 and accelerate an inclusive transition to a global net-zero economy by 2050.

Background to the publications

RE100 is a global initiative bringing together the world's most influential businesses committed to 100% renewable electricity. Its purpose is to accelerate change towards zero carbon grids at scale. As of December 2021, over 75 RE100 companies (including 8 India headquartered companies) had an annual aggregated electricity demand of 8.6 TWh. While this is still significantly low compared to the total Indian Commercial and Industrial (C&I) electricity demand, the potential for impact of RE100 is unprecedented.

This report deep dives into the Renewable Energy Certificates (RECs) mechanism in India, its applicability to businesses to achieve RE100 and ways to accelerate the uptake of this versatile RE procurement option.



**As of December
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Executive Summary

The objective of this document is to focus on RECs as a procurement option and how their potential can be maximised in the Indian market.

Commercial and Industrial (C&I) businesses in India account for 53% of electricity consumption, but only 6% of this requirement is met by direct procurement of renewable power. Most C&I businesses prefer established procurement routes like open access and rooftop solar. However, these routes cannot ensure 100% Renewable Electricity (RE) procurement due to operational and regulatory restrictions and intermittent profile of renewable power output.

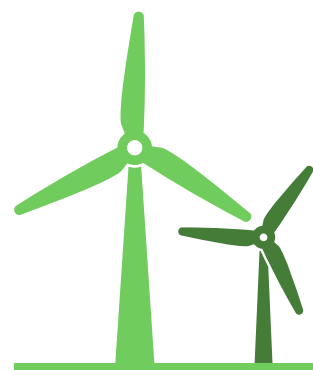
RECs were initially designed as a compliance instrument to allow obligated entities (defined as an entity that falls under the obligation to meet the Renewable Purchase Order) to fulfil Renewable Power Obligations (RPO) targets. The scheme includes a price band (floor and ceiling price) to assure minimum revenue to project developers and price certainty to obligated entities. In the past, issues such as the lack of a transparent methodology to determine price bands and changes in validity periods of RECs have



prevented them from achieving high demand in the market. RE100 supports the procurement of RECs as a viable and voluntary instrument for both obligated and non-obligated Indian companies to meet their RE100 targets. However, we also recognise challenges in the current REC regime such as recurring procedural requirements, no technology-specific RECs, and lack of vintage information, amongst others that are unattractive to RE100 companies. The reforms proposed by the Ministry of Power to address some of these issues like validity and price bands, REC issuance period, and bilateral trading can enhance the market growth of RECs. We have also identified further opportunities where more favourable reforms can accelerate that market growth. Capacity under the REC scheme is estimated to grow to 7.6 GW by 2026 based on the annual capacity trend over the last five years. Additionally, we have reviewed the UK Renewable Obligation Certificate (ROC) system against the Indian REC system in multiple aspects, to identify improvements that can be contextualised to the Indian RE landscape.

The brief is relevant for RE100 companies (and companies which are aiming to maximise RE adoption) to understand, appreciate and endorse the viability of RECs as a procurement option.

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Evolution of RECs in the Indian market

RECs are environmental/green attributes associated with power generated by renewable power projects. RECs can be used by obligated entities (DISCOMs, conventional captive and conventional Open Access businesses) to fulfil their RPO targets. RECs can also be purchased voluntarily. Generation of power and green attributes are differentiated under the Indian REC scheme allowing buyers to buy only green attributes to meet their RE obligations.

The Indian government introduced the REC scheme in November 2010, with the first trading session in February 2011. The scheme was launched to enable obligated entities, primarily those located in RE-deficient states, to meet their RPO targets.

The scheme includes a price band (floor and ceiling price) to assure minimum revenue to project developers and price certainty. Price bands have been revised four times since 2010. Apart from frequent price band revisions, the validity of RECs has also been changed twice – from 365 days to 730 days in July 2013 and 1,095 days in December 2014. These changes were done in response to low demand for RECs during the first three years of the scheme. Lack of a transparent methodology to determine price bands has resulted in the suspension of REC trading twice for a total of 24 months.

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Present status and future trajectory of RECs

JUNE 2010

Determination of price bands

Non solar RECS

Floor price (FP): INR 1500/MWh

Forbearance price (FBP): INR 3900/MWh

Solar RECS

FP: INR 12,000/ MWh

FBP: INR 17,000/ MWh

AUGUST 2011

Revision of price bands

- Solar RECS

FP: INR 9,300/MWh

FBP: INR 13,400/MWh

-Non solar RECS

FBP: INR 3,300 MWh

- Introduction of vintage multiplier

DECEMBER 2014

Third amendment

Discoms eligible to issue RECs for RE generated beyond RPO obligations

Validity of RECs increased to 1,095 days

Revision of solar RECS price bands

FP: INR 3,500/MWh

FBP: INR 5,800/MWh

MARCH 2017

Revision of price bands

Solar RECS

FP: INR 1,000/MWh

FBP: INR 2,400/MWh

-Non solar RECS

FP: INR 1,000/ MWh

FBP: INR 3,300/MWh

- Removal of vintage multiplier

MARCH 2018

Solar RECs trading resumed

JULY 2020

Trading suspended due to revisions in price bands

NOVEMBER 2021

Trading resumed with price bands applicable as per 2017 order

SEPTEMBER 2010

First amendment

- Regulations for captive power plants (CPP) eligibility

JULY 2013

Second amendment

Provision of self-retention

Validity of RECs increased to 730 days

MARCH 2016

Fourth amendment

OA projects eligible for RECS

Captive generating plants registered only till June 2016 to be eligible

MAY-JUNE 2017

Trading suspended due to revision in price bands

Non solar RECs trading resumed in July 2017

JUNE 2020

Revision of price bands

Solar and non-solar RECS

FP: INR 0/ MWh

FBP: INR 1,000/ MWh

JUNE 2021

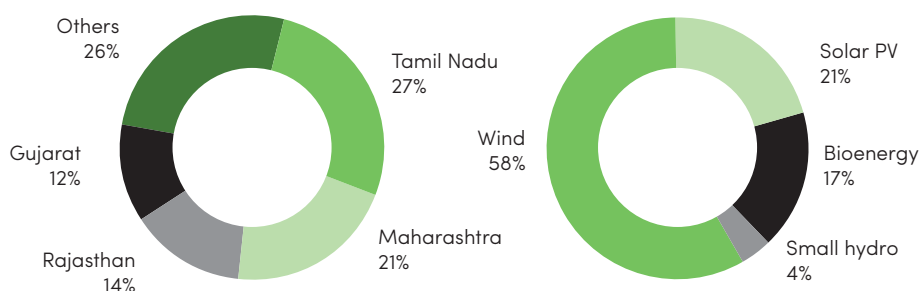
MoP proposed guidelines to redesign REC market

As of 31 December 2021, 1,026 projects aggregating 4,445 MW capacity had been registered under the REC scheme. Seven states, led by Tamil Nadu (27%) and Maharashtra (21%), account for 90% of registered capacity. Wind and solar power account for 58% and 21% of the registered total, respectively.



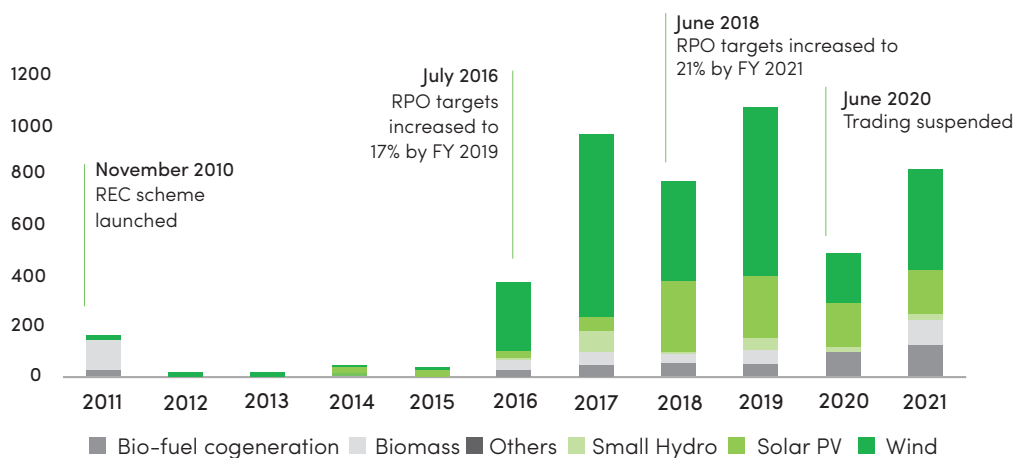
Uptake of RECs across Indian states

Figure 1: Capacity registered under REC scheme as of 31 December 2021, 4,445 MW



Registered capacity addition picked up sharply from 2016 onwards after RPO targets were increased (17% by FY 2019 to 21% by FY 2021) and the Indian government announced a long-term trajectory.

Figure 2: Capacity addition under REC scheme as of 31 December 2021



Source: REC Registry of India

Note: Capacity includes registered projects only.

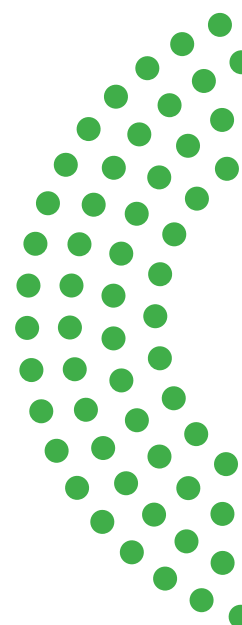
Pricing of RECs

REC price bands are determined by the Central Electricity Regulatory Commission (CERC) and are typically valid for three years. Generally, the Forbearance price is based on the difference between the feed-in tariff determined by state regulators and the average pooled purchase cost. Contrary to this, the floor price is based on the difference between the project viability tariff and the average pooled purchase cost.

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As of December 2021, 76 million RECs were issued since March 2011 (84% non-solar RECs), 65 million had been traded at power exchanges, and generators had retained 2.9 million.



Purchase of RECs

C&I consumers can purchase RECs directly at India Energy Exchange (IEX), Power Exchange India Limited (PXIL), Hindustan Power Exchange or through power traders. They will incur membership fees (in case of direct trading at IEX/ PXIL) or transaction fees to power traders in addition to the clearing price of RECs discovered at the exchanges. Another option C&I consumers have for procurement of RECs is self-retention. Generators can retain RECs to fulfil their consumption anywhere in India. To have RECs, an obligated entity must be the owner of a REC project.

RECs can also be purchased by non-obligated entities voluntarily at power exchanges.

RECs can also be purchased by non-obligated entities voluntarily at power exchanges. As of March 2021, 31,341 RECs had been procured by businesses, and by government-owned companies, like Rural Electrification Corporation, Power System Operation Corporation, National Mineral Development Corporation.





Challenges in the growth of RECs in India

Limited supply is a major challenge for capacity growth in the REC scheme. However, supply-side challenges are procedural and have been addressed to a significant extent through amendments to REC regulations. Some of the key challenges from a consumer point of view are highlighted below:

- 1. Limited supply:** Only 4% of India's renewable power capacity is registered under the REC scheme. Capacity growth over last few years has been very slow due to regulatory uncertainty. This has resulted in limited supply of RECs in the market.
- 2. Limited participation of DISCOMs in the REC market:** Lax implementation of penalties for failing to meet RPO targets has resulted in limited participation by DISCOMs in the REC market, leading to significantly lesser demand for RECs. Many DISCOMs are hesitant to purchase RECs because their procurement does not involve physical power delivery. According to estimates by the Council for Energy, Environment and Water, 27 non-compliant DISCOMs had the potential to create demand for 72.5 million RECs to meet RPO shortfall in FY 2020. However, they only acquired 5.3 million RECs.
- 3. Low transparency in price determination:** The lack of a scientific and transparent methodology for determining price bands degrades the revenue generation outlook of REC projects, making it difficult for developers to raise funds. Additionally, it also determines the long-term RE procurement portfolio of the buyers. Change in price bands every two-three years reduces the visibility of investment outcomes for power buyers and producers alike.
- 4. Legal disputes:** REC prices have been a source of numerous legal disputes resulting in an abrupt stoppage in trading. The challenge to price bands determined by CERC resulted in a halt of solar RECs trading between July 2017 and March 2018. Trading of RECs was also halted between June 2019 and November 2021 after power producers challenged revised price bands determined in June 2017.
- 5. No technology-specific RECs:** Clubbing all non-solar technologies into a single category makes it unattractive to certain consumers. Some C&I consumers prefer to procure RECs generated from specific technologies per their sustainability goal requirements. C&I consumers prefer solar and wind power RECs to those generated by hydropower, bioenergy, or waste-to-energy projects.
- 6. Lack of vintage information:** Voluntary buyers normally prefer having information related to technology, project location and year of power generation before buying RECs. The current market structure does not allow potential buyers to access this information and is one of the reasons for low participation by voluntary buyers in the REC market.



Proposed reforms

The Ministry of Power has proposed amendments to the REC scheme to address issues like validity and price bands. Some major amendments proposed include:

- RECs would have unlimited validity.
- The floor and forbearance price would be removed.
- New projects would be issued RECs for 15 years while existing projects would continue to be issued RECs for 25 years.
- Technology multipliers would be introduced for emerging renewable power technologies.
- Bilateral trading of RECs would be allowed.

There will be critical benefits for the sector from the introduction of bilateral trading, which would increase liquidity and enable the realisation of the market price of RECs. Technology multipliers will benefit emerging technologies like battery storage.

However, proposed reforms fail to address the central issue of low volumes in the REC market – poor supply and demand.



Key recommendations

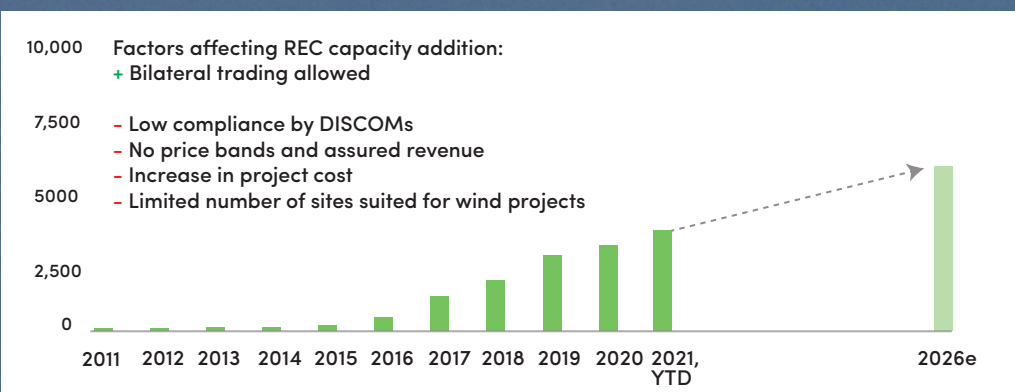
1

Increase supply through modern technologies and smaller projects: New technologies, like solar-wind hybrid, should be made eligible under the REC scheme.

Additionally, rooftop solar power systems eligible only for net billing or gross metering (typically set up by C&I consumers) should be made eligible under the REC scheme. Currently, such systems are paid a feed-in tariff for power injected into the grid, which is counted towards the RPO fulfilment of DISCOMs.

C&I consumers may choose to sell their excess green power in any of the following methods, whichever is cost-effective based on their respective state regulations: –

- i. by selling power to DISCOM at a feed-in tariff,
- ii. by selling power to DISCOMs at a much cheaper rate (average pooled purchase cost) and retaining RECs.



2

Introduce fungibility with the PAT scheme: To increase demand, fungibility with other domestic market instruments (like energy-saving certificates under the Perform-achieve-trade scheme) and international market instruments (like carbon credits) should be explored. One approach to achieve fungibility between REC and PAT schemes is to convert RECs and **Energy Saving Certificates (EScerts)** to a standard metric such as price per tonne of carbon emissions offset or Tonnes of Oil Equivalent (ToE)

3

Link RPO compliance by DISCOMs to central financial assistance: The level of RPO compliance is already a factor in the annual rating of DISCOMs conducted by the Ministry of Power. The weight of RPO compliance in this process should be increased to incentivise DISCOMs to procure more renewable power and RECs.

The release of funds by the central government for various schemes like the Integrated Power Development Scheme (IPDS), rural electrification schemes and Ujjwal DISCOM Assurance Yojana (UDAY) may also be linked to RPO compliance of DISCOMs.

Introduce technology-specific RECs: Non-solar category should be split into individual technologies to allow consumers to buy RECs of a specific technology. This will allow corporate consumers to procure RECs from a technology of their choice making voluntary procurement more attractive.



Capacity addition through uptake of RECs

Capacity under the REC scheme is estimated to grow to 7.6 GW by 2026 based on the annual capacity trend over the last five years. The average annual capacity addition is unlikely to exceed 600 MW. DISCOMs and C&I consumers typically prefer to procure renewable power instead of RECs.

RECs account for an estimated 4-6% of renewable power procurement by C&I consumers. It is not a preferred instrument as it does not involve the physical delivery of renewable power and is typically seen as an additional cost by buyers. An increase in renewable power procurement by C&I consumers is unlikely to influence REC capacity addition as RPO compliance rates from DISCOMs, the largest consumers, are expected to remain low.

UK Renewable Obligation Certificate (ROC) market

The UK's ROC scheme was launched in 2005. It is the world's biggest renewable electricity support scheme, providing around 30% of the electricity supplied in the UK. When new project registrations closed in 2017, more than 23,500 projects were operational under the ROC scheme with a total capacity of 25 GW (including 14.3 GW of wind power and 5.3 GW of solar PV capacity). The scheme is split between two categories depending on project size. Solar projects up to 250 kW and wind and hydro projects up to 5 MW are classified as small-scale projects. All others are considered large-scale projects.

Eligibility criteria for projects under the UK ROC scheme are similar to that under the Indian REC scheme. A key difference between Indian and UK schemes is the implementation of renewable power procurement targets. Obligated entities in the UK are required to purchase a minimum number of ROCs instead of a percentage of power from renewable power sources. Small scale projects have the highest technology multiplier and can be issued up to four ROCs per MWh of power generated. Onshore wind projects have the lowest technology multiplier and are issued 0.9 ROC/ MWh.

Non-compliant entities deposit penalties in a fund as per their shortfall. After deduction of administrative fees, the regulator distributes the remaining funds to compliant entities in the proportion of the number of ROCs purchased by them.

In 2020-21, obligated entities used ROCs to meet 88% of national obligations. Penalty worth GBP £415 million was imposed on non-compliant entities. Over GBP £407 million was distributed among compliant entities.

The UK renewable energy certificate scheme includes multiple instruments increasing the risk of double-counting environmental attributes. Apart from ROCs renewable power generators can also be issued **Renewable Energy Guarantee of Origin (REGO)** certificate, and **Levy Exemption Certificates (LECs)**. REGOs certify that power is generated from a renewable power source while LECs show that a generator is exempted from climate change levy (a tax levied on non-domestic energy consumers). A single certificate system is simpler and easier to manage.

Traceability and avoidance of double counting can be achieved through third-party audits and verifications. One such service is the **EKOenergy ecolabel**, by [EKOenergy](#).

Parameter	UK ROC scheme	India REC scheme
Metric	1 ROC = 1 MWh, subject to technology and project size multipliers	1 REC = 1 MWh
Issuance period after registration	20 years	25 years
Price bands	None	Non-solar: INR 1.00-3.00/ kWh Solar: INR 1.00-2.40/ kWh
Validity	2 years	3 years
Trading	Bilateral	Through power exchanges

What we can learn from the UK ROC market

The rate of compliance among obligated entities is extremely high due to the strict implementation of penalties and the availability of incentives. The penalty for non-compliance is indexed to retail inflation and is revised every year. For 2021, the penalty was set at GBP £51 per MWh (INR 5,050 per MWh) of the shortfall.

an international not-for-profit ecolabel for energy that includes not only renewable electricity but also renewable gas, heat and cold. This way, the EKOenergy ecolabel brings additionality to renewable energy certificates such as Guarantees of Origin (GOs), RECs and I-RECs. It is granted to instruments that fulfil the criteria of Greenhouse Gas Protocol Scope 2 Guidance. In the UK, the EKOenergy label is granted only to REGOs.

Glossary

1. **Floor price** - The minimum price as determined by the Commission in accordance with these regulations at and above which the certificate can be dealt in the power exchange.

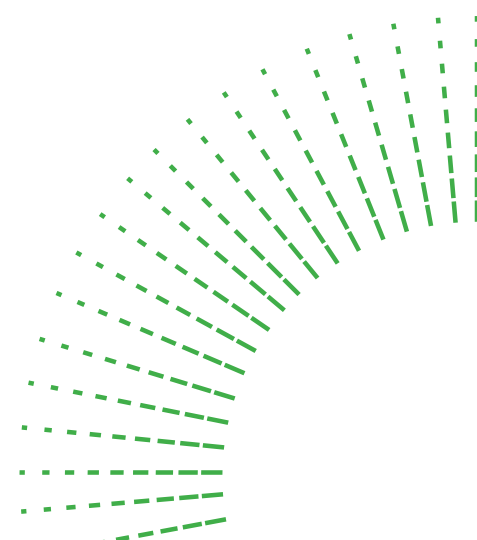
2. **Forbearance price** - The ceiling price as determined by the Commission in accordance with these regulations within which only the certificates can be dealt with in the power exchange.

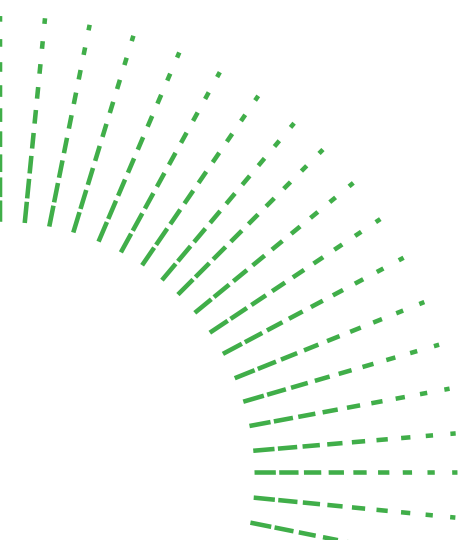
3. **Pooled Cost of Purchase**- The weighted average pooled price at which the distribution licensee has purchased the electricity including the cost of self-generation, if any, in the previous year from all the energy suppliers long-term and short-term, but excluding those based on renewable energy sources, as the case may be.

4. **Banking facility benefit** – The only such banking facility that allows any renewable energy generator to use the banked energy at any time (including peak hours), even if it was injected into the grid during off-peak hours.

5. **The Perform Achieve and Trade (PAT)** - A market-based mechanism to reduce the specific energy consumption in energy-intensive industries. This is facilitated through the trading of ESCerts which are issued to those plants that have overachieved their targets. Those plants who were underachievers of their targets are entitled to purchase ESCerts.

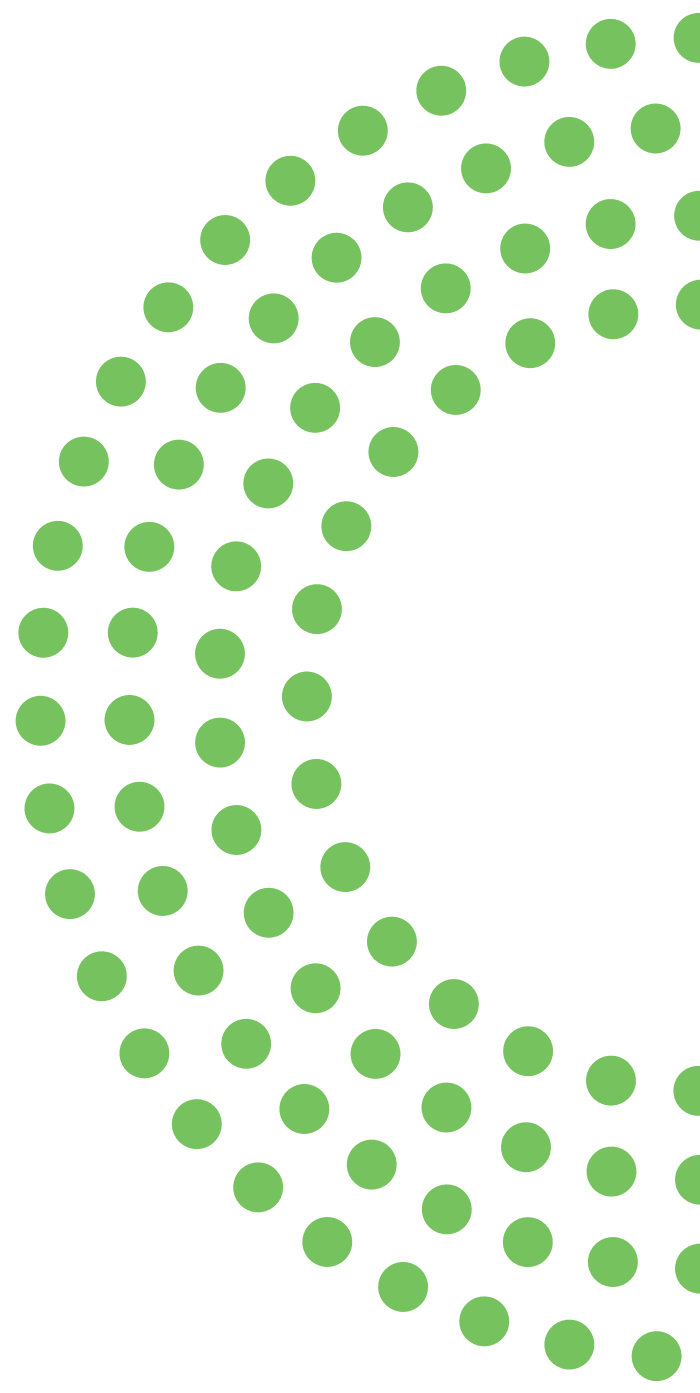
6. **Energy Savings Certificates (ESCs)**- Energy Saving attributes of 1 MTOE of energy-saving by Designated Consumers allowed in Energy Conservation (Energy Consumption Norms and Standards for Designated Consumers, Form, Time within which, and Manner of Preparation and Implementation of Scheme, Procedure for Issue of Energy Saving Certificate and Value of Per Metric Ton of Oil Equivalent of Energy Consumed) Rules, 2012





Disclaimer

The report is a collaborative work of Climate Group and Bridge To India. It does not mean, however, that every group within the companies endorses every word in the report. The "A business case for Renewable Energy Certificates (RECs) for Indian companies to meet RE100 targets" report has been prepared for general informational purposes only and is not intended to be relied upon as accounting, tax, legal or other professional advice and does not accept any responsibility for the consequence of its use.



RE100

CLIMATE GROUP



RE100 is a global initiative bringing together the world's most influential businesses committed to 100% renewable electricity. Led by Climate Group, in partnership with CDP, our mission is to drive change towards 100% renewable grids, both through the direct investments of our members, and by working with policymakers to accelerate the transition to a clean economy. The initiative has over 370 members, ranging from household brands to critical infrastructure and heavy industry suppliers. With a total revenue of over US\$6.6 trillion, our members represent 1.5% of global electricity consumption, an annual electricity demand higher than that of the UK.