

SUSTAINABILITY AT SHILLIM ESTATE

Energy

The energy requirements of the retreat are met by 2 ways electricity and fuels. Electricity consumption can be further divided into 2 segments based on the source namely solar and grid. The fuel consumption can be classified based on type of fuel namely propane and diesel.

The assessment is based on data from May 2018 to April 2019, key observations:

- The data states that diesel accounts 68% of the energy supply. This is extremely high and quite possibly erroneous. The MSEB has agreed to supply only 50% of the energy requirement of the retreat but even that does not explain the high value of 68%.
- For the month of March, the cost per unit is Rs 2.98/kWh which is extremely low for a commercial establishment. The cost for other months is Rs 15.93/kWh on average. The cost per unit also changes across months which should not happen.
- When the expenditure on electricity was compared with data from another report there was a consistent error of ranging from 0-10% in all months. The reason for the discrepancy is not yet known.
- The energy consumption is the highest for the month of May 2018 (8041203.74 kWh) followed by April 2019 (887912.83 kWh) and June 2018 (796369.45 kWh). This is significantly higher than August (758044.58) which has a similar occupancy rate. Weather data states the temperature is the highest during May-June. Using this information we can make an assertion that the energy consumption has a positive correlation with ambient temperature.
- December 2019 has the highest occupancy rate of 73.15 and ranks fourth in terms of energy consumption which supports our assertion.
- The solar energy production drops by around 65% in June, July and August this can be attributed to monsoon rains.
- The detailed data for solar farms has not been shared by Amplus energy solutions at the time of writing this report. Thus no comments can be made on the efficiency of the solar farm.

GHG at Hilton Shillim

May 2018 to April 2019

Electricity from MSEB: 2,348,359.00 kWh/year

CO₂ equivalents generated per kWh : 820 gram CO₂/kWh

Annual GHG produced: 1925654380 gram CO₂/year = 1925.65 tons CO₂/year

Diesel used in generators: 5,737,069.77 kWh/year

CO₂ equivalents generated per kWh: 778 gram CO₂/kWh (taken from Sovacool, 2008)

Annual GHG produced: 4463440280 gram CO₂/year = 4463.44 tons CO₂/year

Energy from solar farm: 315,373.00 kWh/year

CO₂ equivalents generated per kWh: 41 gram CO₂/kWh

Annual GHG produced: 12930293 gram CO₂/year = 12.93 tons CO₂/year

Total : 6402.02 ton CO₂/year

April 2019 to March 2020

Month	Solar 1 Unit (M+) in KWH	Solar 2 Unit (Myson) in KWH	MSEB Unit in KWH	DG Unit in KWH
Apr-19	35,465		2,11,370	79544.61
May-19	36624		224760	88343.21
Jun-19	24197		215890	68327.91
Jul-19	11713		182470	43502.81
Aug-19	12187		177050	35936.69
Sep-19	14293		183180	17197.85
Oct-19	21882	6424	194250	25179.16
Nov-19	25948	23672	182130	6806.46
Dec-19	23322	20071	192520	7559.598
Jan-20	28258	22275	158420	7260.1
Feb-20	29416	27416	171980	2406.08
Mar-20	33,338	31,802	110070	4883.19
Total	2,96,643	1,31,660	22,04,090	3,86,948

Electricity from MSEB: 22,04,090.00 kWh/year

CO₂ equivalents generated per kWh : 820 gram CO₂/kWh

Annual GHG produced: 1,80,73,53,800 gram CO₂/year = 1807.35 tons CO₂/year

Diesel used in generators: 3,86,948 kWh/year

CO₂ equivalents generated per kWh: 778 gram CO₂/kWh (taken from Sovacool, 2008)

Annual GHG produced: 30,10,45,289 CO₂/year = 301.05 tons CO₂/year

Energy from solar farm: 4,28,303 kWh/year

CO₂ equivalents generated per kWh: 41 gram CO₂/kWh

Annual GHG produced: 1,75,60,423 gram CO₂/year = 17.56 tons CO₂/year

Total : 2,125.96 ton CO₂/year

Percentage of solar power in total consumption - 16%

Carbon footprint reduced - 303.239 tonnes of CO₂ (equivalent to CO₂ sequestration by 395 acres of forest land)

Food Waste Management

Organic Waste Convertor

Month	OWC out put in KG
Oct-19	3000
Nov-19	2500
Dec-19	2400
Jan-20	2900
Feb-20	1800
Mar-20	500
Total	13,100

Output used for landscaping and gardening activities in the retreat.

Water

5 sewage recycling units are installed across the retreat, recycled water is discharged in hereby water stream.

Rainwater harvesting is done during monsoon - retreat is self-sufficient to serve its water demand during July-October.

Watershed structures –

Organic Farming – Farm Garden

The farm garden produced around 1000 kg of vegetables in 2019-20.

Plants grown till now in 2020

1. Blue beans
2. White beans
3. Iceberg Lettuce
4. Arugula
5. Green Lettuce
6. Red lettuce (Lollo Rosso)
7. Romaine Lettuce
8. Italian Basil
9. Purple Basil
10. Mint
11. Spear mint
12. Pepper mint
13. Oregano
14. Thyme
15. Yellow zucchini
16. Green zucchini
17. White pumpkin
18. Chinese caabage
19. Cabbage
20. Cauliflower
21. Brinjal
22. Chilli
23. Cherry tomato
24. Bitter gourd
25. Gourd
26. Cucumber
27. Papaya
28. Thai ginger
29. Bay leaves
30. Allspice
31. Ginger
32. Turmeric
33. Lime
34. Strawberry
- 35.