The Energy and Resources Institute

Ministry of New and
Renewable Energy, GoI

GRIHA

"Preparing the Next-Gen for Sustainability"

GRIHA For Day Schools

Sustainable is Affordable

THE **9**TH **GRIHA SUMMIT** 2017

December 18–19 , 2017 | New Delhi

19th December 2017
at
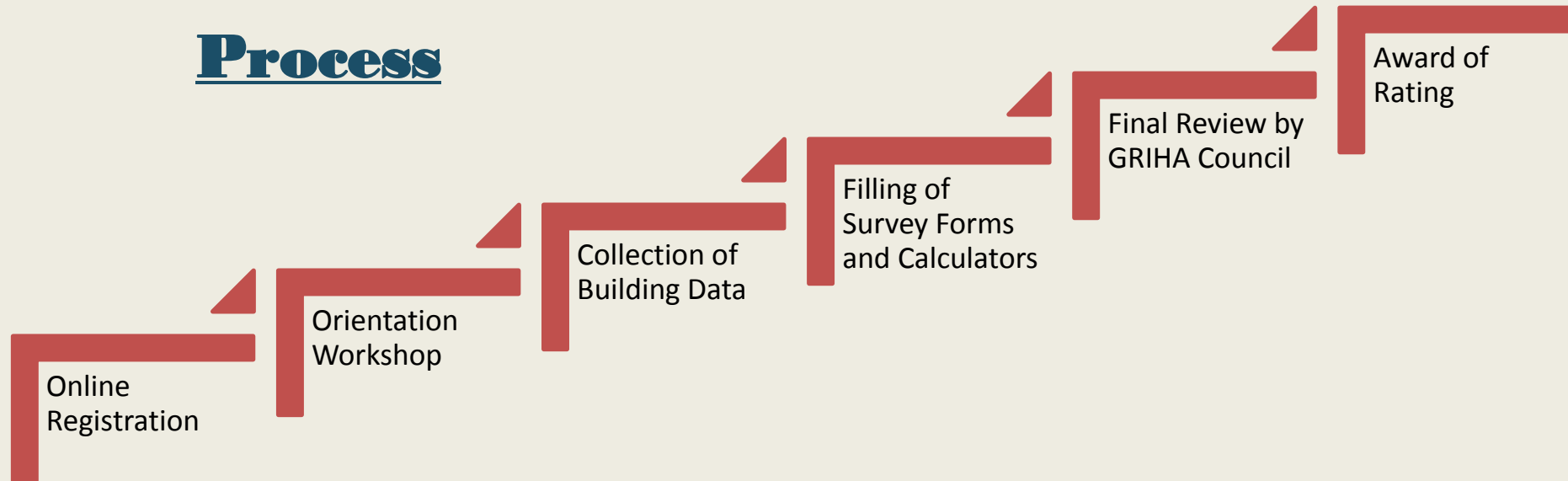*India Habitat Center, Lodhi Road, New Delhi*

Ankit Bhalla
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What is 'GRIHA For Day Schools'?

'GRIHA for Day Schools' rating system has been jointly developed by GRIHA Council and The Energy and Resources Institute (TERI). It is an assessment tool cum training module for school students to evaluate the environmental performance of their school against nationally-accepted benchmarks.

Process

Online Registration

Orientation Workshop

Collection of Building Data

Filling of Survey Forms and Calculators

Final Review by GRIHA Council

Award of Rating

GRIHA Council

Why you should adopt 'GRIHA For Day Schools'?

❑ Rating system especially designed for existing day schools.

❑ Self-Assessment Tools: Simplified user-friendly calculators for all sections – Energy, Water, Solid Waste Management, Comfort and Trees.

❑ Informative exercise for students as it becomes a demonstration project through which the students can learn the methods of reducing their environmental impacts.

❑ Performance of schools can be assessed and observed through energy and water bills.

❑ Prepares students to respond to climate change by engaging them in sustainable development.

GRIHA for Day Schools

ENERGY

COMFORT

TREES

SECTIONS

SOCIAL

WATER

SOLID WASTE MANAGEMENT

Section – Wise Distribution of Points

Distribution of Points

Max. Points	Section	Min Threshold*
15	Energy	7
13	Water	7
8	Comfort	4
6	Social	3
5	Trees	3
3	Solid Waste Management	1
50	Total	25

* To achieve rating

POINTS ACHIEVED   **GRIHA for Day Schools Rating**

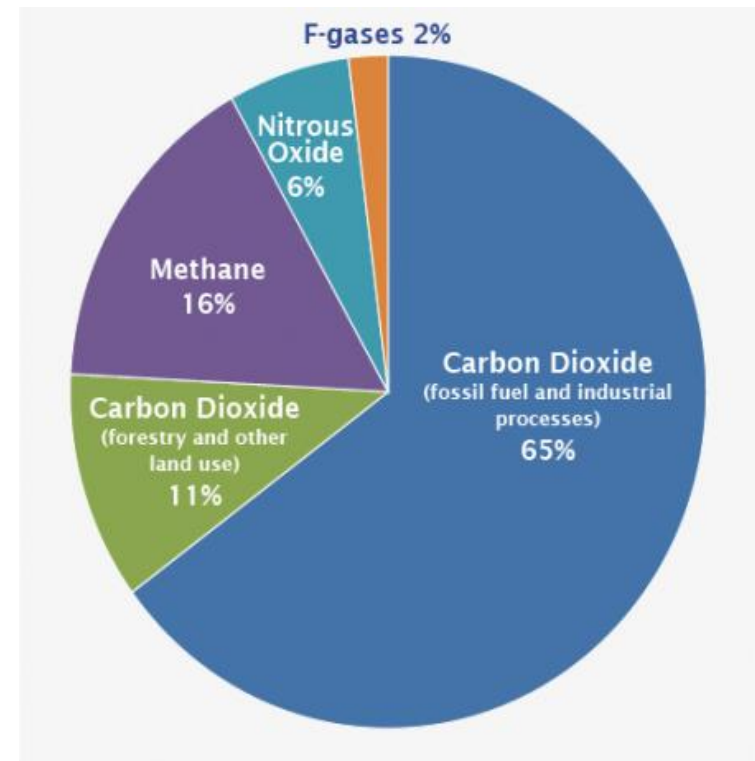| Points Achieved	Rating
45 - 50	★★★★★
40 – 44	★★★★
35 – 39	★★★
30 – 34	★★
25 – 29	★

Criterion 1 – Per Capita CO2 emissions – Building and Transport

What is greenhouse effect and what are greenhouse gases?

- The greenhouse effect is a natural process that warms the Earth's surface when certain gases present in the atmosphere, trap the Sun's energy. The gases are called Greenhouse Gases.

- Among all Greenhouse Gases, the main contributors to the Greenhouse effect are Carbon Dioxide and Methane.[1]

- An enhanced Greenhouse effect is the primary cause of Global Warming, which is the average rise in surface temperature.
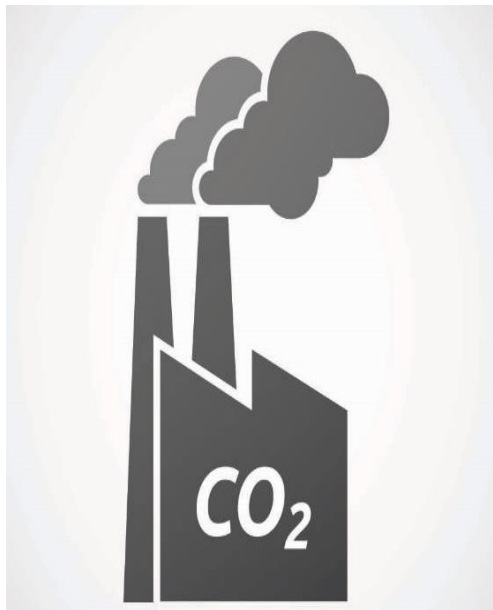

Global Greenhouse Gas Emissions by Gas

[1] www.epa.gov/ghgemissions/global-greenhouse-gas-emissions-data

What do we do in GRIHA for Day Schools?

- We study the CO2 emissions produced by a school, in order to study it's impact on Global Warming.

- We do so by studying the CO2 emissions produced by:

1. Buildings

2. Transportation

Methods of reducing CO2 emissions in your school:

METHODS

1.Compost all non-animal based organic materials – Composting should be done so that waste does not produce emissions

2. Recycle everything –
Old school furniture can be donated or used to build new furniture. Paper should also be recycled.

3. Reduce energy waste – Switch off appliances when not in use, to save energy

4. Switch to renewable power – Install solar panels or other sources of renewable energy

5. Make the school run more eco-friendly - Encourage students and teachers to use public transport or promote cycling/walking. Carpooling should be encouraged for students and staff travelling by private vehicles.

RECYCLE - REUSE - REDUCE

| Energy | Comfort | Trees | Social | Water | Solid Waste Management |

Criterion 2 – Use of Energy Efficient Appliances

'Save Energy'

Why do we need to save energy?

- ❑ Risk of depletion

- ❑ Reduces Pollution

- ❑ Mitigates Global Warming

- ❑ Clean Future for your kids

How can we save energy?

- ❑ Turn off lights when not in use
- ❑ Use energy efficient such as CFLs and LED bulbs.
- ❑ Students should turn off monitors that will not be used for the next class period
- ❑ Using fans can make people feel degrees cooler, at much less cost than air conditioning.

| Energy | Comfort | Trees | Social | Water | Solid Waste Management |

Criterion 3 – Efficient Outdoor Lighting

'Outdoor Lighting'

What is Outdoor Lighting used for and Why does it need to be efficient?

❑ In Schools, Outdoor lighting is used for safety purposes.

❑ Hence, they need to operate throughout the night, consuming lots of energy.

❑ Due to this, Outdoor lighting should be Energy Efficient.

How can we achieve Energy Efficient Outdoor Lighting?

❑ Selection of efficient lamps:

❑ Automatic Control for Outdoor Lights

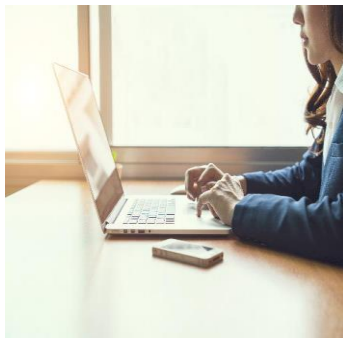AUTOMATIC LIGHTING

Criterion 4 – Visual Comfort Inside Campus

'Visual Comfort'

Why do we need Visual Comfort?

❑ Studying in low indoor lighting conditions directly impacts the learning
❑ ability of students.

❑ Lack of adequate lighting causes strain on the students' eyes.

❑ Good lighting conditions are essential for visual comprehension.

However, Too much Illuminance is also not good as glare causes a problem in reading.

How can we achieve Good Visual Comfort Inside Campus?

❑ Good indoor lighting levels can be achieved through a combination of daylighting and indoor artificial lighting.
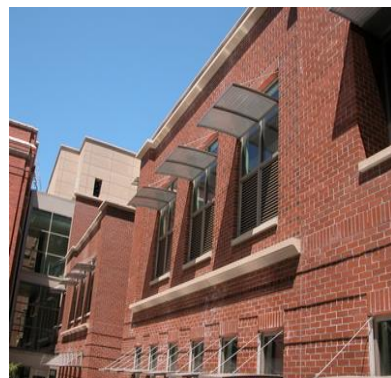
Criterion 5 – Thermal Comfort Inside Classrooms

'Thermal Comfort'

What is Thermal comfort?

- ❑ Thermal comfort refers to being in an environment with comfortable temperature and humidity.

- ❑ It depends on the outdoor temperature of the environment.

- ❑ Thermal comfort varies for different climatic zones.

[1]

Why do we need thermal comfort inside classrooms?

- ❑ Excessive heat build up inside classrooms coupled with reduced ventilation can lead to thermal discomfort amongst students.

How to achieve Thermal Comfort in Schools?

- ❑ Provision of external shading devices based on orientation of building

- ❑ Provision of High Reflective paints (White color) on the terrace.

- ❑ Schools should monitor the indoor temperature and relative humidity levels.

[1] http://www.tboake.com/gallery/lillis_gallery.html

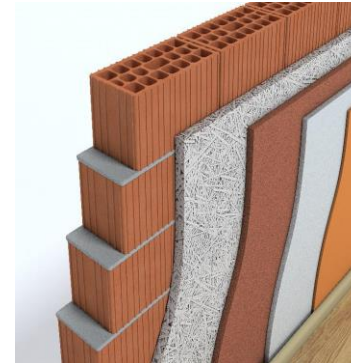| Energy | **Comfort** | Trees | Social | Water | Solid Waste Management |

Criterion 6 – Acoustic Comfort on Campus

'Acoustic Comfort'

Why do we need Acoustic Comfort in schools?

❑ **Noise pollution affects the learning experience of students , by disturbing student – teacher interaction, concentration of student etc.**

❑ **We need acoustic comfort in schools for better learning and good concentration levels of students.**

How do we achieve Acoustic Comfort in schools?

❑ **Insulated walls / Partitions**
❑ **Buffer Areas - Create buffer areas along boundary of school using trees to block external noise.**

| Energy | Comfort | Trees | Social | Water | Solid Waste Management |

Criterion 7 – Indoor Air Quality

'Air Quality'

Why do we need good Indoor Air Quality?

❑ Indoor exposure to pollutants like particulate matter, high levels of Carbon Dioxide etc. can cause health problems

❑ For occupants to stay in a healthy learning environment, good air quality is required.

How to achieve Good Indoor Air Quality?

1. Planting Houseplants in Classrooms

2. Control Mold Growth

3. Planting more trees on campus

4. Remove Garbage from Boundaries of School:

Criterion 8 – No. of Trees in school

'Trees'

What is the importance of trees?

- ❑ Trees clean the air
- ❑ Trees provide oxygen
- ❑ Trees cool the streets and the city

- ❑ Trees provide food
- ❑ Trees shield from ultra-violet rays
- ❑ Trees heal

Criterion 9 – Social Initiatives

'Social Initiatives'
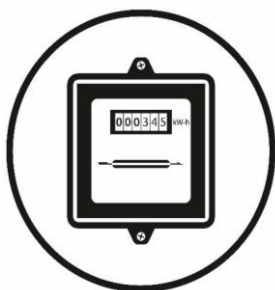
What all social initiatives should a school take?

1. Universal Accessibility

2. Activities on Social & Environmental Awareness

3. Annual Health Checkup/ Immunization Camps

4. Visual Representation of Water & Energy Consumption

5. Fire Safety

6. Area per student

7. Display posters around the school

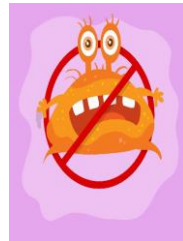# Criterion 10 – Maintaining Hygienic Conditions in School

'Hygiene Conditions'

What is the importance of hygiene in schools?

❑ The importance of sanitation and hygiene should be taught to students from a young age.

❑ Lack of hygiene and sanitation poses a health risk for the students.

❑ A lot of diseases are caused due to poor hygiene and sanitation.

How should hygiene and sanitation be maintained in a school?

❑ Toilets should be regularly cleaned
❑ Soaps should be provided for hand washing
❑ School premises should be cleaned and disinfected daily.
❑ Leaking taps should be fixed
❑ Regular cleaning

| Energy | Comfort | Trees | Social | Water | Solid Waste Management |

Criterion 11 – Annual Water Consumption

'Water Consumption'

Why do we need to conserve water?

❑ Of all the water in the world, only 3% is fresh. Less than one third of 1% of this fresh water is available for human use. The rest is frozen in glaciers or polar ice caps, or is deep within the earth, beyond our reach.

How can we conserve water in schools?

1. Turn off taps properly after using them

2. Harvest Rainwater

3. Use Efficient Flushing Systems in School

FULL FLUSH   HALF FLUSH

4. Recycle and Reuse of Water

5. Check for leaks in the plumbing system

| Energy | Comfort | Trees | Social | **Water** | Solid Waste Management |

Criterion 12 – Rainwater Harvesting with appropriate filtration system

'Rainwater Harvesting'

Why should we conserve rainwater?

❑ Rainwater is clean water which can be re-used for various purposes like:

❑ Agricultural purposes & for feeding live-stocks.

❑ The ever-increasing demand for water can be satisfied.

❑ Water-logging on roads and thoroughfares can be avoided.

❑ Raising the quantity of ground water (recharging) and checking soil erosion.

❑ Storing for future purposes.

Criterion 13 – Water Quality

'Water Quality'

Why do we need clean water?

❑ **The effects of drinking contaminated water can be immediate as well as long term.**

❑ **The immediate health effects can include nausea, lung irritation, skin rash, vomiting, dizziness, and in some cases death.**

❑ **Drinking contaminated water is more likely to cause long term health effects like cancer, liver and kidney damage & damage to the immune system.**

Criterion 14 – Adopt strategies for segregation of waste in school

'Waste Segregation'

Why is segregation of waste Important?

❑ If waste is not separated, mixed waste produces harmful products when disposed on land, causing pollution.

❑ Methane , a greenhouse gas, is produced from waste.

How can we segregate waste in schools?

❑ Installing multi – colored bins for different types of wastes

| Energy | Comfort | Trees | Social | Water | **Solid Waste Management** |

Criterion 15 – Recycle Organic and Inorganic Wastes

'Organic & Inorganic Waste'

Why is recycling of waste important?

☐ Recycling helps to reduce the pollution caused by waste.

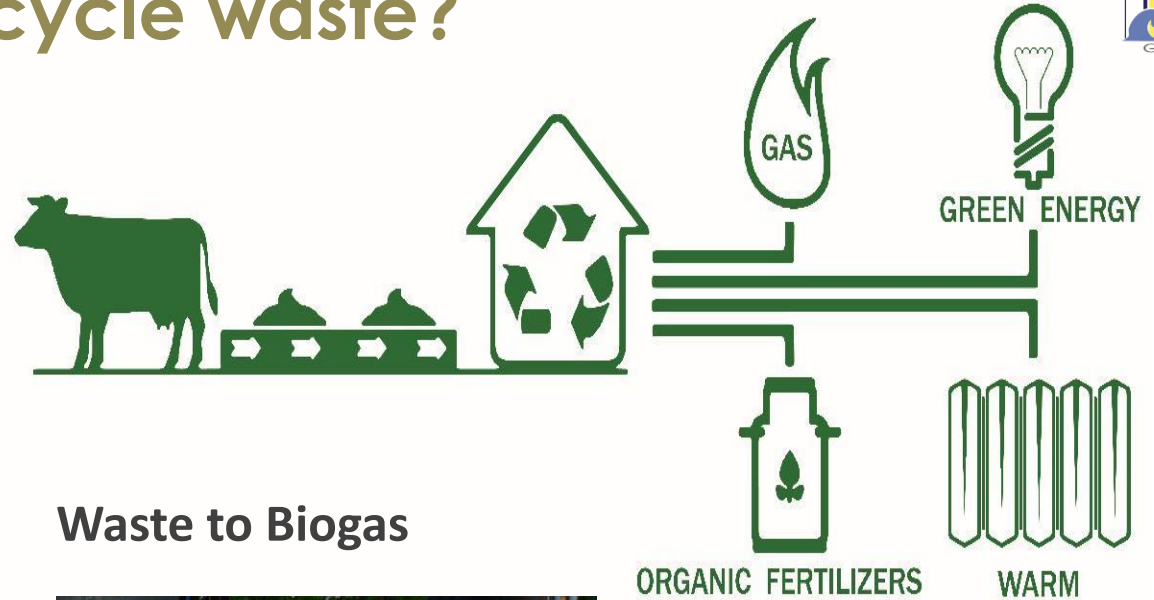☐ Recycling reduces the need for raw materials so that the forests can be preserved.

☐ Recycling requires much less energy and therefore helps to preserve natural resources.

How can we recycle waste?

Composting

Waste to Biogas

GAS

GREEN ENERGY

ORGANIC FERTILIZERS   WARM

Three bin method:

THANK YOU