



The Indian Perspective on COVID19

**Lessons Learned & Case Studies
from Green Buildings**

27 July 2021

Indian Green Building Council (IGBC)

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❖ At the outset – IndiaGBC (IGBC)

➤ **Thank - Green Building
Council Indonesia (GBCI)**



- ❑ **Opportunity**
- ❑ **Total Support**



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Agenda



- 1. About IGBC**
- 2. Measures - Indoor Air Quality
More Safer and Healthier-
A Green Building Solution**
- 3. Government of India's - Key Action
Points!**



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Indian Green Building Council
Greening India since 2001

1. About IGBC



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Indian Green Building Council (IGBC)

❖ IGBC, formed in 2001, by CII

❖ Vision of IGBC

- Enable 'sustainable built environment for all'
- India to be one of the global leaders in sustainable built environment by 2025



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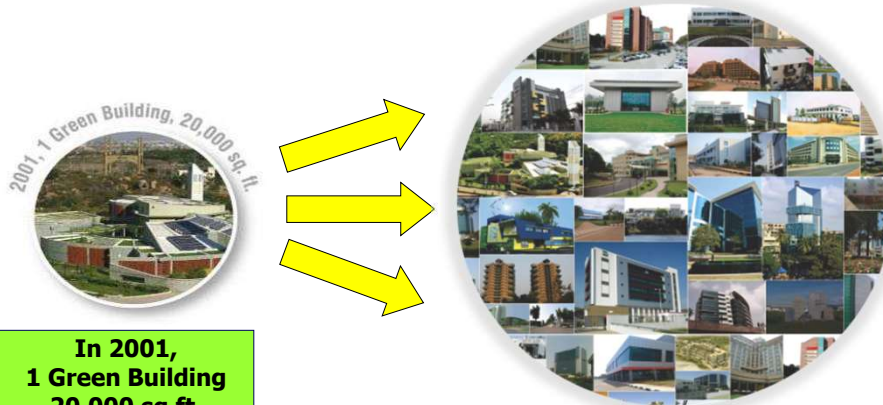
India's first Platinum rated Green Building is now Net Zero Energy Building



**CII Godrej GBC always demonstrates first before
promoting the concepts**

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Green Building Movement in India



**(6,781 Green Projects)
7.86 Billion sq.ft**

India among Top 3 in the World with Largest Green Footprint

IGBC aspiration: Achieve 10 Billion sq.ft by year 2022



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WorldGBC - IGBC

❖ **World Green Building Council is a global network of GBC's from over 70 Countries**

➤ **IGBC - 'Founding Member' of WorldGBC, since 2003**



WORLD
GREEN
BUILDING
COUNCIL



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29 IGBC GREEN Rating Systems

Commercial	Residential	Built Environment	Industrial
1. IGBC Green New Buildings	9. IGBC Green Homes	16. IGBC Green Campus	25. IGBC Green Factories
2. IGBC Green Existing Buildings	10. IGBC Green Residential Society	17. IGBC Green Cities	26. IGBC Green SEZ
3. IGBC Green Interiors	11. IGBC Green Affordable Housing	18. IGBC Existing Cities	27. IGBC Logistics & Warehouses
4. IGBC Green Data Centres	Transit	19. IGBC Green Villages	Health & Wellbeing
5. IGBC Net zero Energy	12. IGBC Green Metro Stations	20. IGBC Green Township	28. IGBC Green Healthcare Facilities Rating (PC)
6. IGBC Net Zero Water	13. IGBC Green Existing Metros	21. IGBC Green Landscape	29. IGBC Healthy Building for Occupants
7. IGBC Green Resorts	14. IGBC Green Railway Stations	22. IGBC Hill Cities	
8. IGBC Green Service Buildings	15. IGBC Green High Speed Rail (HSR)	Education	
		23. IGBC Green Schools	
		24. IGBC Places of Worship	
Places where we stay, live, learn, work, play, transit & worship should all go green			

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IGBC rating systems – Aligned with Global Green Building Trends



for Building a better future

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Greening India since 2001

2. Measures -Indoor Air Quality

More Safer & Healthier- A Green Building Solution



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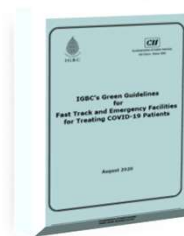
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Build Back Better : COVID Guidelines

IGBC Guidelines
Combating
COVID-19 in
Green Buildings



IGBC Green Guidelines
Fast Track and
Emergency Facilities
for Treating COVID-19
Patients



Guidelines for addressing COVID-19 issues in Office Buildings



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Air Quality



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1. Start-up procedure for HVAC and Equipment

- ❖ Recommended to operate buildings initially at 25% occupancy and gradually increase as a stagnant manner
- ❖ Have dedicated staff for O&M of HVAC and Equipment
 - Allow only designated personnel to have access to all HVAC area (Plant & AHU room, Cooling Tower, Pumping Station, BMS Room, Electrical Panel etc.)
 - Instruct designated personnel to wear mask all time and sanitized gloves
 - Use personal safety kit (goggles/eye protection, shoe covers) while performing maintenance activities
 - Wash hands with soap, regularly, after O&M activities



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1. Start-up procedure for HVAC and Equipment

- ❖ Building Flush Out to be performed before initial 2 hours of operation
 - Keep Door & Windows Open and Switch on all Exhaust Fan
- ❖ Before occupancy clean filters, grilles, diffuser and internal surfaces
- ❖ Flush out the building by operating fans
- ❖ Install clean filters
 - Use filters such as MERV 13 or equivalent
- ❖ Initial few days block the return air dampers to avoid recirculation and open the fresh air damper 100%
- ❖ Avoid air-conditioning equipment without provision of fresh air
 - CSU (ceiling suspended Unit) or FCU (Fan Coil Unit)



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2. Outdoor Pollutants

- ❖ An Entry way system - at least 2 meters (6 feet) length
 - At all main entrances of the building
- ❖ Air Curtains at entrances
- ❖ Buffer zones at entries points
- ❖ Fresh air inlets to be placed away from sources of contamination



*Picture courtesy Paharpur Business Centre, New Delhi

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2. Outdoor Pollutants . . .

➤ Air Filtering Media

(for Mechanically Ventilated Buildings)

- ❑ Install air filtering media after building flush-out, with atleast MERV 13 or EU 7



MERV 13 Filters

➤ Germicidal/ UV Lamps

(for Mechanically Ventilated Buildings)

- ❑ Install Germicidal / UV lamps in Air-Handling Unit (AHU) cooling coils



UV Germicidal Light



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3. Air Quality

❖ Three basic ways to reduce contamination and microbial count in air are to

1. Control Humidity

- ❑ Dry air can make people more susceptible to infection. On the other hand, air that's too moist encourages bacteria growth.
- ❑ 30% - 60% based on the outdoor conditions and temperature

2. Control Air Purity

- ❑ Particulate matter, including bacteria and viruses, is a leading cause of poor indoor air—found in 85% of spaces

3. Control Air Freshness

- ❑ while today's tightly sealed spaces are great for conserving energy, they can also trap bacteria in the air.



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Indian Green Building Council
(Confederation of Indian Industry-2001)

Air Quality Control



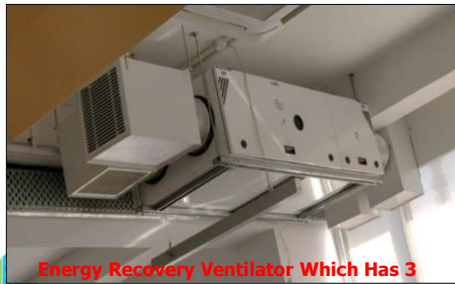
Filters in AHU



UVGI Technology



Electronic Air Cleaner & Display



Energy Recovery Ventilator Which Has 3 Levels Of Filtration
MERV 7 + Chemical Filter + MERV 13



Electronic Air Cleaner installed



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4. Operating Characteristics – HVAC and Equipment

- ❖ Disable demand controlled ventilation*, open 100% fresh air dampers
- ❖ Maintain the following Temperature and Relative Humidity
 - Thermostat setting between 26 -28 °C
 - Relative Humidity between 40% and 60%
- ❖ Avoid use of Heat Recovery Wheels (HRW) in case they are leaking
- ❖ Till COVID-19 gets under control avoid using water collected through condensation as make-up water.
- ❖ Periodically carryout chemical dosing for cooling tower water using dilute hydrochloric acid and chlorine



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5. Hygiene: Interior furniture & finishing

❖ Rearrange work stations layout

- Increase gross area per person to maintain distance (6 ft)



❖ Rearrangement of furniture layouts in common areas

- Lobby, waiting room, meeting rooms to maintain distance

❖ Additional facilities on each floor

- Balconies/ open areas / designated rooms on each floor for relaxation



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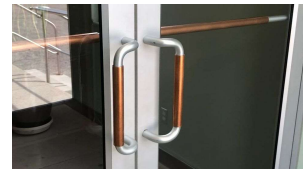


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6. Hygiene: Interior furniture & finishing

❖ High Touch surfaces

- Regular sanitisation of high touch surfaces – work stations, door handles, hand rails, lift doors & lift buttons, etc.
- Have anti bacterial coatings on high touch surfaces
 - ❑ Copper coating
- Have automatic facilities
 - ❑ Sensor Based -
 - ✓ Doors
 - ✓ Lighting
 - ✓ Water fixtures
 - ✓ Hand dryers, . . .



Design - 'more' Touch Free Experience!

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7. Housekeeping Protocols

- ❖ Have well defined procedures in place to maintain cleanliness and hygiene thereby reduce the risk of spreading respiratory and other communicable diseases.
 - Work Spaces, Regularly Occupied Spaces, Kitchens and Pantry areas, Toilets and Washrooms, Corridors and Waiting areas
 - Sanitisation & disinfection of regularly occupied spaces
 - Regular maintenance of other areas
 - ❑ Water dispensaries
 - ✓ Encourage occupants to use personal water bottles
 - ❑ Kitchen/ Dining / Canteen area
 - ✓ Proper cleaning of plates, cups, glasses and cutlery
 - ✓ Coffee vending machines, fridge, microwave oven, etc.
 - ✓ Proper hygienic food preparation practice to be followed



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House Keeping Protocols

Integrated Pest Management



Daily Cleaning and Dust Management



Detailed Housekeeping Protocols



Disinfection of All High Touch Surfaces to Reduce Communicable Diseases



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*Pictures courtesy Paharpur Business Centre, New Delhi



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Hygiene and Sanitization

Daily Sink Disinfection



Sanitation of All Table Tops



Dedicated Sanitisation of All High Touch Surfaces



Urinal & WC Disinfection/Cleaning



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*Pictures courtesy Paharpur Business Centre, New Delhi



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8. Eco-friendly Housekeeping Chemicals

❖ Few application areas:

- Floor cleaning
- Glass cleaning
- Toilet bowl cleaning
- Carpet cleaning



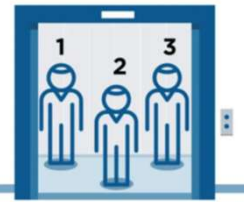
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9. Contamination Control & Hygiene

- ❖ Data collection and maintain records of building visitors and occupants.
- ❖ Have infrared thermometers or install thermal cameras to check temperature of occupants & visitors.
- ❖ Install sanitation points and designate isolation areas near the entrance of the building.
- ❖ Regular cleaning & disinfection of high touch surfaces.
- ❖ Design for more touch free experience.
- ❖ Reduce no. of people per floor area. (social distancing).
- ❖ **Efficient and safe waste disposal technics.**
- ❖ Regular maintenance and cleaning of mechanical systems, ducts, pipelines, water storage tanks etc.
- ❖ Use of automatic and sensor based systems.



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10. IGBC's Green Guidelines for Fast Track & Emergency Facilities Treating COVID-19 patients



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Focus Areas – IGBC GREEN Fast Track & Emergency Facilities Treating COVID-19 patients

1. Layout
2. Site Selection for Greenfield Facility
3. Modular Structures for Temporary Facilities
4. Hygiene Practices
5. Ventilation Parameters
6. Energy Efficiency
7. Water Conservation
8. Waste Management
9. Interior Furnishings
10. Facilities for Health Workforce



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1. Layout

- ❖ Design of the facility shall be categorised as under:
- ❖ Level 1 - Quarantine Facilities
 - Care for symptomatic covid patient with mild symptoms and do not require oxygen
 - Only quarantine facility for mild illness
- ❖ Level 2 - Isolation Facilities
 - Provides Oxygen to those who require but not in need of intensive care
- ❖ Level 3 - Critical Care facilities
 - Includes intensive care facility with Oxygen and mechanical ventilation

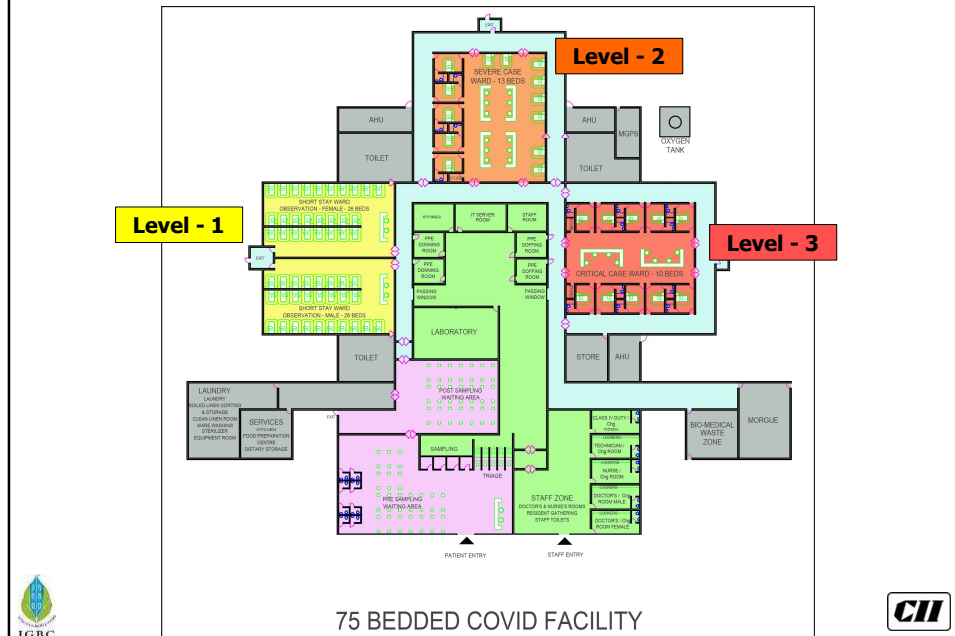


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Typical Layout Design

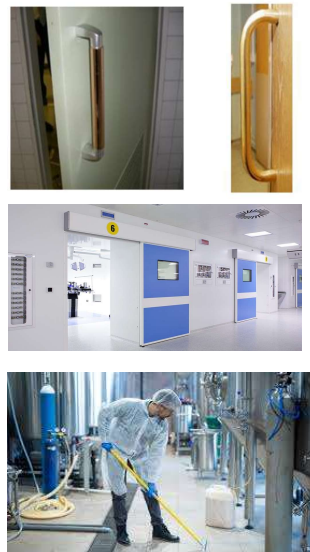


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a. Hygiene Practices

- ❖ Signages/ posters/ floor markings for social distancing
- ❖ Sensor based automatic doors from the entrance to all areas
- ❖ Anti-microbial copper on high touch surfaces
- ❖ Better housekeeping practices in patients & health workforce occupied area

Copper in the Hospital



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b. Ventilation Parameters

❖ Guidelines have been framed based on different ventilation spaces

- Air-conditioned with AHUs
- Air-conditioned with Unitary Equipment
- Mechanical Ventilation
- Naturally Ventilated



❖ Major aspect addressed includes

- Ventilations design parameters & Infection control measures
 - ❑ Temperature, Humidity, Fresh air, Room Pressure, Exhausts & Filtration Media



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c. Interior Furnishings

❖ Addressed social distancing aspects

- Maintain 6 feet distance in
 - ❑ Arrangement of beds
 - ❑ Furniture layouts for workforce
 - ❑ Furniture layout in common areas



❖ Encourages Colour psychology features in the facility

- Through appropriate colour selection in the interior wall/surfaces
 - ❑ Walls, paintings, linens, bedsheets, curtains etc



❖ Recommends to select materials for interior furnishings that are

- Antibacterial, Easy to maintain, Resistant to microbial growth, Nonporous and Seamless



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d. Facilities for Health Workforce

- ❖ Provide required items for health workforce
 - Masks, PPE kits, Face shields, Gloves, sanitisers
- ❖ Provide stress relieving spaces
 - Facilities for mental relaxation
- ❖ Provide dormitories for workforce
- ❖ Optimise staff working timings appropriately



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Benefits – IGBC GREEN Fast Track & Emergency Facilities Treating COVID-19 patients

- ❖ Guidelines are addressing major aspects in the treatment facilities
 - Layout design, Infection control, Ventilation Parameters, Waste management
- ❖ Addressing opportunities to reduce operating costs
 - Energy & Water
- ❖ Facilitates in improving conditions in the facility
 - Patients & Healthcare Workforce



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Other Preventive Measures . . .



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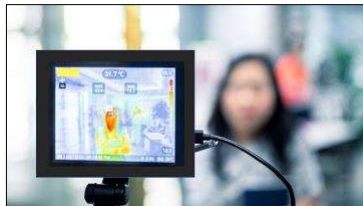
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1. COVID19 Preventive Measures ...

- ❖ Operate Company owned buses at 30 -50% capacity/
Encourage employees to use own vehicles as far as possible



- ❖ Use touch free biometric and thermal scanning devices



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2. COVID-19 Preventive Measures ...

- ❖ Rearrange work stations and furniture in common areas to maintain social distancing



- ❖ Periodically sanitise all the offices spaces and washrooms with green housekeeping chemicals



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3. COVID-19 Preventive Measures ...

- ❖ Organise physical fitness & stress relief programmes for occupants
 - Designate open areas/ balconies for occupant relaxation



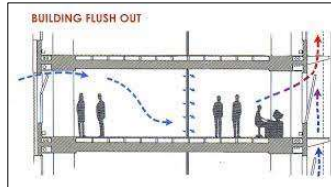
- ❖ Install separate storage bins for disposal of used masks, gloves, tissue papers, etc.



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4. COVID-19 Preventive Measures ...

- ❖ Perform Building Flushout 2 hours before operation



- ❖ Install clean filters (MERV 13 or equivalent) and UVGI lamp in AHU
 - UV spectrum is capable of inactivating microorganisms, it eliminates growth of fungal, mold etc.



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5. COVID-19 Preventive Measures

- ❖ Install/ Retrofit with sensor-based fixtures
 - Faucets, water closets & urinals, hand dryers, water dispensers



- ❖ Use Long handle (Surgical) faucets in washrooms / kitchen/ dining areas



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6. Indoor Air Quality

- ❖ **Constantly Measures, Monitors & Maintains various IAQ parameters**

➤ **PM10, PM2.5, CO₂, Ozone, TVOC, SO_x & NO_x**

Location	PM10 (µg/m ³)	PM2.5 (µg/m ³)	PM1 (µg/m ³)	CO ₂ (ppm)
Ambient	640	412	390	420
Green house	14	9	7	415
5 th Floor	13	10	8	482

Test done on October 31, 2016



Air purifiers and IAQ display



IAQ Monitoring Sensor



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Daylight and Natural Ventilation

The Best Sanitizers!

Daylight



'Natural' Ventilation



Build Back Better : COVID Guidelines

IGBC Guidelines Combating COVID-19 in Green Buildings



IGBC Green Guidelines Fast Track and Emergency Facilities for Treating COVID-19 Patients



Aspects Addressed

- Hygiene in Buildings
- HVAC and related equipment
- Water and plumbing fixtures
- Measures at construction site
- People transit

Appropriate measures for

- Existing Buildings
- Before Starting Operations
- Retrofit projects by design
- During Construction
- Construction Workers Welfare

Broadly addressing 10 Areas of Concern

- Layout
- Site Selection for Greenfield Facility
- Modular Structures for Temporary Facilities
- Hygiene Practices
- Ventilation Parameters
- Energy Efficiency
- Water Conservation
- Waste Management
- Interior Furnishings
- Facilities for Health Workforce



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Indian Green Building Council
Greening India since 2001

3. Government of India's – Key Action Points!



The measures are illustrative & NOT exhaustive

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COVID – 19 Interventions by CII - *Policy*

In consultation with industry members, CII is continuously compiling immediate business challenges across multiple sectors for minimising the fallout of emergency Coronavirus health measures on the economy. It is providing policy suggestions for macroeconomic management, monetary measures, and ease of doing business.



CII has also been supporting and assisting industry members to address issues arising out of various measures at the state and district level that impact their operations.

Policy Representations

202

Meetings

213

Queries Resolved

348

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CII Covid – 19 Interventions – *Helpline & Relief Material*



CII Initiatives*

22,075
oxygen cylinders

93,685
face masks



16,150 PPE kits

2,351
pulse oximeters

17,595
food and ration kits

*As on 28 May 2021

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CII - sensitising through media

❖ CII - Mission Vaccination - #Vaccine4All

#Vaccine4All

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Rollout of Vaccine

- 1 HEALTHCARE WORKERS**
- 2 FRONTLINE WORKERS**
- 3 PEOPLE ABOVE 50 YEARS OF AGE**
- 4 PEOPLE BELOW 50 YEARS OF AGE & WITH COMORBIDITIES**

#SMS4Safety = Sanitization & Hand Washing, Mask Use, Social Distancing

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IGBC

CII

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Measures taken @ IGBC HQ

Vaccination Drive for employees, their families and members



Registration Desk



Verification Desk



Scheduling & Waiting Area



Post Vaccination Care



Photo Booth

Socially Distanced Cafeteria Seating



Odd & Even Work Stations



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GoI - Mitigation & Management Strategies

❖ COvAID Platform

❖ Regular video conferences with Chief Ministers of States

- Surveillance
- Contact Tracing
- Containment Zones
- Increase Testing
- Homecare
- Quarantine Management
- Awareness Creation & Behaviour Change
- Production & Distribution of Medical Supplies
- Medical Waste Management . . .



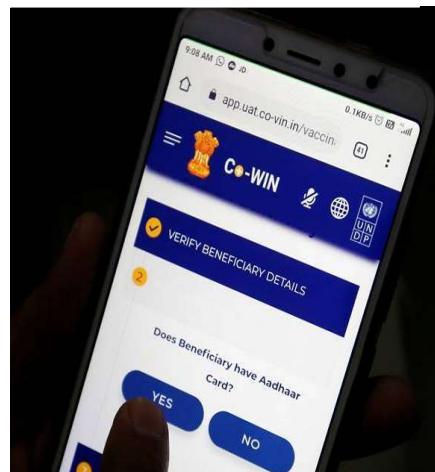
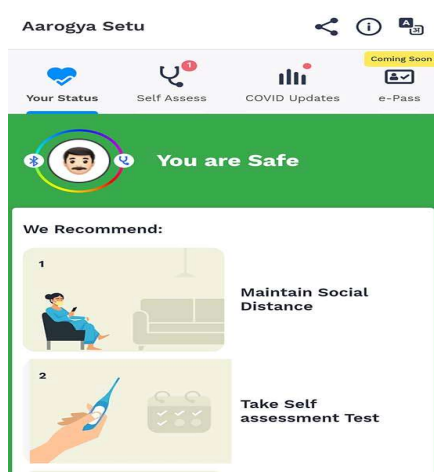
The measures are NOT exhaustive

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Aarogya Setu & CoWin Apps



CoWin goes global, 76 countries want to use India's Covid vaccination platform software

In an interview to ThePrint, Dr R.S. Sharma, chief of the Empowered Committee on Covid vaccine, also said passport numbers can now be linked to vaccine certificates for international travel.

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Other Measures

❖ **Metro Train Usage Regulations**

- Cashless Transactions wherever possible
- Penalty for failure to wear a face mask
- Passenger Occupancy restricted to up to 50%
- Frequent Disinfection of facilities

❖ **Economic Stimulus Measures**

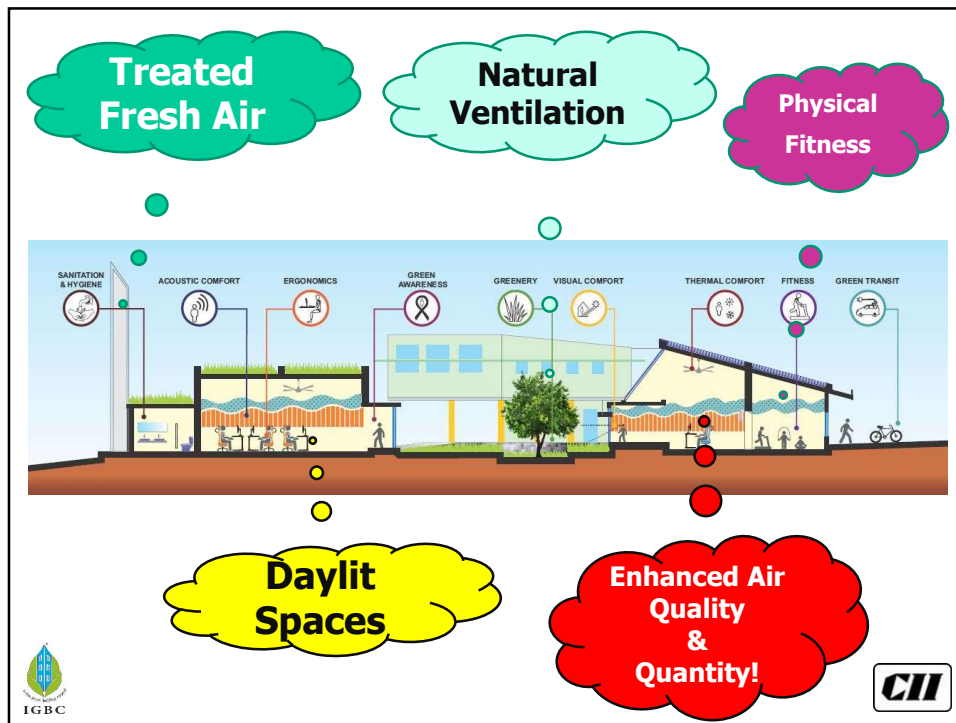
- Reduction of repo rates
- Disbursement of collateral free loans
- Extended Moratorium period
- R&D grant for biotechnology sector
- Production Linked Incentives to boost manufacturing and exports



❖ **Trade Facilitation Measures**

- 24x7 customs clearance
- Modified definition for MSMEs
- 1st fiscal support package –
 - ❑ INR 1,700 billion
- Atmanirbhar Bharat Package -
 - ❑ INR 20,000 billion

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To Sum-up

- ❖ **Green Building features**
 - ❖ **Enhances Indoor Air Quality**
 - ❖ **Provides More safer places for people!**
- ❖ **Every citizen – Greater role to combat COVID-19**



“Together, we can make The World A Better Place”

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Go Green . . .

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