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No. J-25011/37/2010-Gen
Government of India
Ministry of Petroleum & Natural Gas
(General Section)

New Delhi dated the 18th February, 2010.

To

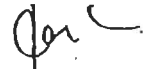
The Chief Executives of all PSUs

Subject: Note on Green Rating for Integrated Habitat Assessment (GRIHA) received from Ministry of New and Renewable Energy.

Sir,

I am directed to forward herewith a copy of D.O. No.31/18/2008/UICA(ST) dated 27.1.2010 along with enclosures received from Ministry of New and Renewable Energy on the subject cited above for information and compliance.

Yours faithfully,



(Rajesh Kukreti)

Under Secretary to the Govt. of India

Tel: 23385866

Encl: As above.

Copy to: US(Admn.), Ministry of petroleum & Natural Gas for similar action.

Copy obtained from Indian Oil Corporation

Ms. Mili Majumdar

Pranav Kumar
21/11/11

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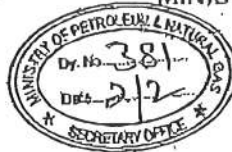
Deepak Gupta

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for circulation to
all oil PSUs/US (Adm) S.No. 1 (UR)
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Date 4/3/10

सचिव
भारत सरकार
नवीन और नवीकरणीय ऊर्जा मंत्रालय
SECRETARY
GOVERNMENT OF INDIA
MINISTRY OF NEW AND RENEWABLE ENERGY

D.O.No.31/18/2008/UICA (ST)

27th Jan. 2010

Dear RS

803/55(m)
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There is growing concern over the likely adverse impacts of climate change and growing recognition of the need to take effective steps for reduction of greenhouse gas emissions. One of the problem areas is the rapidly increasing energy demand and the need to produce it from conventional fuels. It follows that every possible effort has to be made to reduce the demand for electricity wherever possible.

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2. It is well recognized globally that buildings are responsible for more than 40% of total energy use. Total energy use in buildings is growing, especially in developing countries, owing to rapid urbanization. In India, the real estate and construction sector is growing at a rate of about 10%. But it is also recognized that the buildings sector represents amongst the best and most cost effective opportunities for reducing energy demand because it is possible to reduce energy consumption through appropriate climate responsive building design and energy efficiency measures. It is agreed by experts that a little additional investment today to improve energy efficiency of buildings and using clean energy techniques would bring substantial cost savings over its life cycle.

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3. Being conscious of this, the Government of India had promulgated the Energy Conservation Act in 2001, which provides for efficient use of energy and its conservation and for matters connected therewith or incidental thereto. Under the provisions of this Act, Bureau of Energy Efficiency (BEE) was set up to assist in developing policies and strategies with a thrust on self-regulation and market principles. The Energy Conservation Building Code (ECBC) was formally launched in May 2007 by the Ministry of Power for its voluntary adoption in the country. The National Building Code (NBC) brought out in 2005 by Bureau of Indian Standards (BIS) incorporated the concepts of energy efficient solar buildings. NBC-2005 has been used as the reference document for various components of a building and equipment used therein.

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4. In view of the increased consciousness generated related to environment and climate change, efforts to construct Green Buildings got started all over the country which not only take care of energy conservation but also look into water and waste management, environmental impact, minimum destruction of natural resources. Building Rating Systems have been found quite effective globally in raising awareness in this regard. A comprehensive buildings rating system, called GRIHA, which is suitable for Indian climatic conditions, has been developed by MNRE based on the initial work carried out at The Energy & Resources Institute (TERI) and feedback received from group of architects and experts. The rating system is in harmony with the NBC 2005, ECBC 2007 and other IS codes. For operationalization of GRIHA, the Ministry has supported setting up of GRIHA Secretariat as an autonomous body. In addition, a National Advisory Council (NAC) provides advice and directions to the Rating System. The NAC is composed of experts and representatives of various stakeholders including Ministry of Power, Ministry of Urban development, Confederation of Real Estate Developers Associations of India etc.

Contd..

वर्षा ऊर्जा से देश विकसित

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5. The Government has been considering how to enhance energy conservation in Government buildings. In a CoS meeting chaired by Cabinet Secretary, held on 17 December 2009, a decision was taken that all new buildings of Central Government/Public Sector undertakings would at least meet the requirements of GRIHA 3 Star, though every effort would be made by them to achieve higher star rating wherever site conditions permit to do so. Ideally, all organizations would aim at reaching GRIHA 4 star rating. Meanwhile, the CPWD had already taken a decision to follow GRIHA ratings in all Buildings built by them.

6. In order to implement the decision of the CoS, you are requested to send necessary directions to all the Central organizations and PSUs under the control of your Ministry requesting them to take note of the CoS decision and ensure that all new buildings be constructed henceforth accordingly. They may also be requested to identify such buildings (along with their type such as office / residential / community etc. and the expected / proposed covered area) and to send this information to this Ministry for consolidation and preparation of an action taken report for information to the CoS within a month. The MNRE is arranging for awareness generation and capacity building of architects and engineers involved in this work and, therefore, would like to be informed about such requirements.

7. All such buildings would be required to register with the GRIHA Secretariat because the process of meeting GRIHA requirements and ratings starts from the beginning. Necessary guidance would also be provided from the design stage itself. MNRE would pay the registration fees on behalf of the organization or Ministry to facilitate this. I may like to add here that various incentives which are available under different schemes of this Ministry for deployment of Solar Hot Water Systems, Roof Top PV Systems and Waste Recycling for Energy Generation, may also be utilized in construction of these green buildings.

I am enclosing a detailed note on GRIHA and how points are earned, along with a list of buildings which are already or being registered with GRIHA.

Early action is requested.

With regards,

Yours sincerely,

Encl: As above



(Deepak Gupta)

Shri R.S. Pandey,
Secretary,
Ministry of Petroleum & Natural Gas,
Shastri Bhawan, New Delhi.

असहज ऊर्जा से देश विकास

नवीन और नवीकरणीय ऊर्जा मंत्रालय
ब्लॉक नं. 14, केन्द्रीय कार्यालय परिसर, लोदी रोड, नई दिल्ली-110003
Ministry of New and Renewable Energy
Block No. 14, CGO Complex, Lodi Road, New Delhi - 110 003

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Green Rating for Integrated Habitat Assessment (GRIHA)

1. GRIHA - the green building rating system evaluates the environmental performance of a building holistically over its entire life cycle, thereby providing a definitive standard for what constitutes a 'green building'. The rating system, based on accepted energy and environmental principles, strikes a balance between the established practices and emerging concepts, both national and international.
2. On a macro scale, the rating system seeks to benefit the community at large through
 - Reduced energy consumption, resulting in savings on account of reduced energy bills without compromising on achieving the human comfort levels
 - Integration of solar energy devices, such as, solar water heating systems and roof top PV systems to generate on-site energy for various requirements
 - Waste recycling and reuse
 - Reduced water consumption
 - Reduced air and water pollution (with direct health benefits)
 - Reduced destruction of natural areas, habitats, and biodiversity, and reduced soil loss from erosion etc.
 - Increased user productivity
 - Enhanced image and marketability
3. The primary objective of the rating system is to help design green buildings and, in turn, help evaluate the 'greenness' of the buildings. The rating system follows best practices along with national/international codes that are applicable to achieving the intent of green design. It has derived useful inputs from the building codes/guidelines being developed by the Bureau of Energy Efficiency, Union Ministries of New and Renewable Energy and Environment and Forests (MNRE and MoEF), and the Bureau of Indian Standards.
4. The rating system helps 'design and evaluate' new buildings (the rating process is most useful to projects when implemented at their conceptual stage before designs and specifications are frozen). GRIHA Assessment is based on predicted building performance over its entire life cycle - inception through operation. The issues addressed at various stages are as follows.
 - Pre-construction stage (intra- and inter-site issues)
 - Building planning and construction stage (issues of resource conservation and reduction in resource demand, resource utilization efficiency, resource recovery and reuse, and provisions for worker and occupant health and well being). The prime resources that are considered in this section are land, water, energy, air, and green cover.
 - Building operation and maintenance stage (issues of operation and maintenance of building systems and processes, monitoring and recording of consumption, and occupant health and well being, and also issues that affect the local and global environment).
5. GRIHA has 100 points distributed across 34 criteria. The framework consists of some core criteria which are mandatory while the rest are optional. A project has to comply with all the mandatory requirements in order to contend for certification. Further the project has to score points, which can be earned by complying with the

at the time of registration. Projects desirous of availing this incentive however have to commit for achieving a high rating. A minimum 3 star and above is prescribed for projects smaller than 5000 sq.m and a minimum 4 star and above is prescribed for projects larger than 5000 sq.m The prescribed format for 'undertaking' can be obtained from the GRIHA Secretariat. Application for GRIHA rating consisting of registration form containing project details, the undertaking given by competent authority on the official letterhead and the project drawings can be submitted to the GRIHA Secretariat. The GRIHA Secretariat shall conduct a preliminary review of the documents and hold a meeting to confirm compliance with mandatory requirements and evaluate possible level of star rating. Based on the outcome of this meeting, the GRIHA Secretariat shall recommend the sanction of incentives from the Ministry. Projects that are not likely to achieve more than 2 stars can still register with the GRIHA Secretariat for rating by paying the registration-cum-rating fees.

10. Requirements of the Rating System

The requirements of the rating system are summarized in the tabular form below.

Criterion	Commitment	Maximum Points	Exception Clause
Criterion 1	Partly Mandatory		
Site Selection	The selected site should be in conformity with the development plan/master plan/UDPFI guidelines. This should comply with the provisions of eco-sensitive zone regulations, coastal zone regulations, heritage areas, water body zones, various hazard prone area regulations, and others IF the site falls under any such area.	(mandatory)	
	The selected site should be located within ½ km radius of an existing bus stop, commuter rail, light rail or metro station and/or select Brownfield site.	1 point	
Criterion 2	Partly Mandatory		
Preserve and protect landscape during construction	Ensure proper timing of construction with respect to rain and confine construction activity to pre designated areas	1 point	
	Proper implementation of staging and spill prevention plan and effective erosion and sedimentation control to prevent soil erosion.	1 point	
	Preserve top soil by employing measures described in the Technical background	1	Contaminated sites/sites that do not have fertile top soil that is considered worth storing for reuse
	Preserve existing vegetation by means of non-disturbance or damage to the trees and other form of vegetation OR Trees/plants replanted within site premises in ratio of 1:3.	Make selection 1 point (mandatory IF trees exist on the site prior to construction)	Sites that are devoid of mature trees For above mentioned category; however, demonstrated adequate tree plantation shall fetch 1 point

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circulation efficiency	Use of aggregate utility corridors	1 point	
	Consolidation of utility corridors along the previously disturbed areas or along the new roads, in order to minimize unnecessary cutting and trenching, and to ensure easy maintenance	1 point	
Criterion 8	Mandatory		
Providing Sanitation /safety facilities for construction workers	Compliance with NBC norms on construction safety for ensuring safety during construction	1 point	
	Provision for Health and sanitation facility as specified above	1 point	
Criterion 9	Mandatory		
Reduce air pollution during construction	Adopt measures to prevent air pollution in the vicinity of site, due to construction activities.	2 points	
	Provision in the contract document that the contractor will undertake the responsibility to prevent air pollution.		
Criterion 10			
Reduce landscape water requirement	Reduction in water consumption by 30% OR	1 point	
	Reduction in water consumption by 40% OR	1 point	
	Reduction in water consumption by 50%	1 point	
Criterion 11			
Reduce water use within the building	Reduction in water consumption by 25%	1 point	
	Reduction in water use by 50%	1 point	
Criterion 12			
Efficient water use during construction	Efforts to minimize potable water use during construction	1 point	
Criterion 13	Partly Mandatory		
Optimize building design to reduce conventional energy demand	Climate responsive building design	2 points	
	Adequate day-lighting in each functional area (minimum level mandatory and higher levels optional)	4 points (partly mandatory)	
	Efficient Artificial Lighting System Design	2 points	
Criterion 14	Partly Mandatory		
Optimize energy performance of	Compliance with Energy Conservation Building Code of the BEE	6 points (Mandatory)	

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	Use of low-energy technologies/materials (not based on the utilization of industrial waste), which are used for non-structural applications such as infill wall system and cause a minimum five per cent reduction in the use of high-energy materials such as cement, concrete, steel etc. by absolute volume when compared with equivalent products for the same application, for 100% infill wall system used in a building, meeting the equivalent strength requirements, as per all the compliance clauses.	2 points	
Criterion 17			
Use low energy material in interiors	Sub-assembly/internal partitions/paneling/false ceiling/in-built furniture	2 points	
	Flooring	1 point	
	Doors/Windows, Frames	1 point	
Criterion 18	Partly Mandatory		
Renewable energy utilization	Rated capacity of proposed renewable energy system is equal to more than 1% of internal lighting and space conditioning connected loads or its equivalent in the building (1 point mandatory)	1 point (Mandatory)	
	IF Rated capacity of proposed renewable energy system meets annual energy requirements equivalent to at least 5% of internal lighting connected load	1 point	
	IF Rated capacity of proposed renewable energy system meets annual energy requirements equivalent to at least 10% of internal lighting connected load	1 point	
	IF Rated capacity of proposed renewable energy system meets annual energy requirements equivalent to at least 20% of internal lighting connected load	1 point	
	IF Rated capacity of proposed renewable energy system meets annual energy requirements equivalent to at least 30% of internal lighting connected load	1 point	
Criterion 19			

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Criterion 26			
Use low -VOC paints/ adhesives/ sealants	Zero/low-VOC paints - zero/low - VOC paints for 100% of all paint used in the interior of the building	1	
	Low-VOC sealants and adhesives - 100% of all the sealants and adhesives used are water based rather than solvent based/low in solvent content	1	
	100% of composite wood products with no urea-formaldehyde resins	1	
Criterion 27	Mandatory		
Minimise ozone depleting substances	All the insulation used in building are free of Chlorofluorocarbons (CFCs) and Hydrochlorofluorocarbons (HCFCs)	1 point (Mandatory)	
	All the HVAC and refrigeration equipment are free of CFCs and HCFCs		
	The fire suppression systems and fire extinguishers installed in the building are free of halon		
Criterion 28	Mandatory		
Ensure water quality	Water quality conforming to Indian standards. Drinking: IS 10500-1991, Irrigation: IS 11624-1986	2 points (Mandatory)	
		2	
Criterion 29			
Acceptable outdoor and indoor noise levels	The outdoor noise levels are within the acceptable limits as set in Central Pollution Control Board- Environmental Standards-Noise (ambient standards)	1 point	
	The indoor noise levels are within the acceptable limits as set in National Building Code of India-1984, Part VIII-Building Services, Section 4-Acoustics, Sound Insulation and noise control.	1 point	
Criterion 30	Mandatory		
Tobacco and smoke control	Company policy for ban/prohibition of smoking within the building premises or	1 point (Mandatory)	
	A signed template by HVAC/architectural consultant certifying that all compliances are met in case designated smoking areas are provided.		
Criterion 31			

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achieving a high star rating but not as a comprehensive and exhaustive checklist for achieving a high rating.

Site planning:

- Select appropriate site as per GRIHA guidelines
- Ensure sedimentation /erosion control/save trees (IF they exist) / plant more trees by appropriate planning of the construction work.
- Design the building as per site conditions
- Control Air pollution at all stages of construction
- Ensure safety and health of construction workers
- Control hard paving/run off/manage utilities efficiently
- Use energy efficient outdoor lighting (use RE based lighting)*
- Use native trees and shrubs for landscaping to reduce landscape water demand over GRIHA benchmark by 40% (reduce by 50%)*

Energy / Water / Waste

- Reduce 25% water demand over GRIHA benchmarks (developed based on National Building Code) (by 50%)*
- Save water in construction
- Comply with the mandatory requirements within the ECBC (Energy Conservation Building Code)
- Meet prescriptive shading norms of ECBC, provide daylight, avoid over design of artificial lighting
- Reduce energy performance index over GRIHA benchmark by 10%(by 30%)*
- Provide 1% equivalent connected load of lighting and HVAC through Renewable Energy power (meet 10% lighting consumption through RE power)*
- Use fly ash based products in minimum two of the following three areas: (structure/walling/finishing)
- Recycle wastewater and reuse 25% of treated wastewater (IF wastewater quantity is higher than 10kL/day)
- Segregate and store waste appropriately

Indoor environmental quality

- Minimize the usage of Ozone depleting products in the building structure and systems.
- Use low VOC (Volatile Organic Compound) paints
- Ensure compliance of water quality with relevant BIS standards
- Restrict Smoking in the building
- Provide Universal accessibility

12. Capacity Building for Constructing Green Buildings

CPWD has adopted GRIHA as their reference for Green Building Design & Construction and has further embarked on a nation-wide capacity building drive for its officers. The Works Manual of CPWD is also being updated to facilitate green building

List of projects Registered/Being Registered with GRIHA

S.No.	Project	City	Type
1	Centre for Environmental Science and Engineering, IIT	Kanpur	Institutional
2	ITC Residential building	Kolkata	Residential
3	Office of Public Works Department	Nashik	Integrated
4	The Doon School	Dehra Dun	Institutional
5	Suzlon Energy Limited	Pune	Commercial
6	Fortis hospital	New Delhi	Institutional
7	Commonwealth Games Village	New Delhi	Residential
8	GreenSpaces (PBC)	Faridabad	IT, ITES
9	Project Garden, Hindustan Unilever	Mumbai	Commercial
10	Crown Technopark	Faridabad	IT, ITES
11	Abacus Towers	Faridabad	Commercial
12	SP Infocity	Manesar	IT, ITES
13	Police Training School, Tasgaon	Maharashtra	Institutional
14	Fortis Hospital	Gurgaon	Institutional
15	Municipal corporation of Delhi, Civic Centre (HQ)	New Delhi	Commercial
16	DMRC, Sushant Lok,	Gurgaon	Metro Station/Mall
17	HAREDA - Akshay Urja Bhawan	Chandigarh	Institutional
18	National Fisheries Development Board	Hyderabad	Commercial
19	Govardhan Eco Village	Mumbai	Spiritual
20	IRDA	Hyderabad	
21	Oil and National Gas Corporation	Noida	Residential
22	National Hydrel Power Corportalon	Faridabad	
23	ITC Grand Chola Hotel	Chennai	Hospitality
24	ITC Sonar Extension	Kolkata	Hospitality
25	South Central Railways Rail Nirman Nilayam	Hyderabad	
26	IISER	Pune	Institutional
27	IISER	Bhopal	Institutional
28	IISER	Trivandrum	Institutional
29	AIIMS	Bhuvaneswar	Institutional
30	IIT, New Lecture Theatre and Lab block	New Delhi	Institutional
31	Pimpri Chinchwad New Town Development Authority	Pune	Commercial
32	Civil Services Officers Institute, Vinay Marg	New Delhi	Institutional
33	Norwegian Embassy, Chanakyapuri	New Delhi	Embassy
34	Haryana Technology Park	Faridabad	IT, ITES
35	Embassy Pristine	Bangalore	
36	IIM, Hostel Complex	Ahmedabad	Residential
37	SIDBI	Bhubneshwar	Commercial
38	CPCB	Bhopal	Commercial