

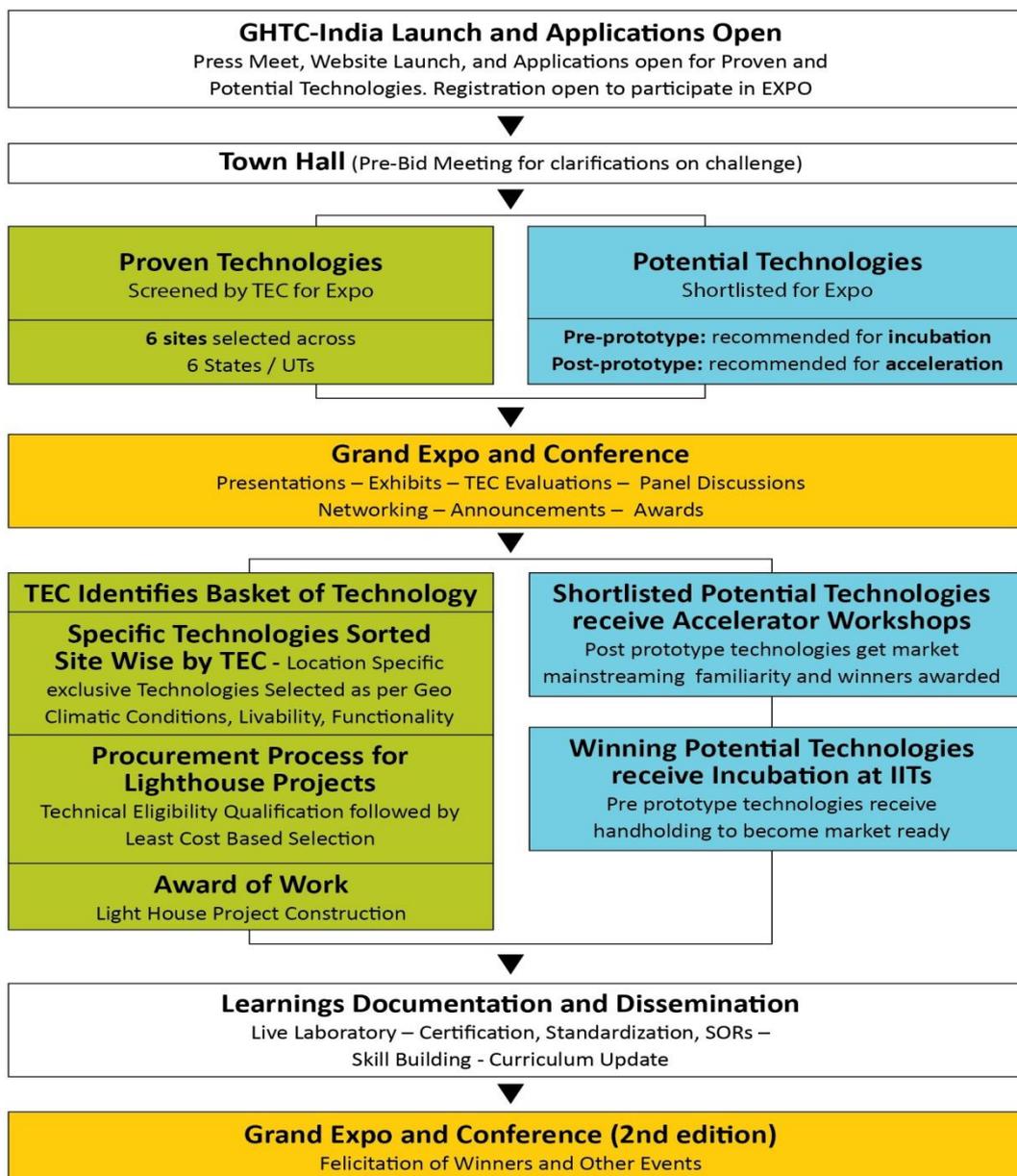
Government of India
Ministry of Housing and Urban Affairs (MoHUA)

Global Housing Technology Challenge- India (GHTC-India):

Summary: GHTC-India

Global Housing Technology Challenge-India (GHTC-I) intends to get the best globally available innovative construction technologies through a challenge process. It aims to demonstrate and deliver ready to live-in houses in minimum time and minimum cost with high-quality of construction in a sustainable manner. This challenge seeks to promote future potential technologies through Incubation support and accelerator workshops, in order to foster an environment of research and development in the country.

The process flow chart of GHTC-India is summarized as below:



1 Rationale

1.1 India is undergoing rapid urbanization. While 31% of India's population lived in urban areas as per Census 2011, this number is expected to grow to 40% by 2030 with a contribution of 75% of India's Gross Domestic Product (GDP). Large sections of the society are migrating to urban areas for better job opportunities and quality of life from rural areas. These Cities need to provide a receptive, innovative and productive environment, which can promote faster and sustainable growth ensuring a better quality of living. Hence it is imperative to have a comprehensive strategy to fulfill the rising demand in the housing sector.

1.2 Ministry of Housing and Urban Affairs (MoHUA), Government of India, launched the Pradhan Mantri Awas Yojana (Urban) {PMAY (U)} in 2015 to provide housing for all by the year 2022. Under this scheme, against a validated demand of 10 million houses are to be constructed by 2022; about 7 million houses have been sanctioned by MoHUA till date out of which 1.5 million houses has been handed over to the beneficiaries. About 3.7 million are under construction, out of which about 1.25 million are using innovative and alternative technologies. Within the ambit of the overarching PMAY (U), a Technology Sub-Mission (TSM) was set up, to facilitate the adoption of innovative, sustainable, eco-friendly and disaster-resilient technologies and building materials for low-cost, speedier and quality construction of houses.

1.3 The Hon'ble Prime Minister envisaged the importance of the adoption of new and innovative construction technologies to improve the pace and quality of work under PMAY (U) to address the challenges of rapid urban growth and its attendant requirements. Construction of houses at this scale is an opportunity for inviting alternative technologies from across the globe to trigger a major transition through the introduction of cutting-edge technologies, building materials and processes. MoHUA has, therefore, conceptualized a Global Housing Technology Challenge-India (GHTC- India) to enable a paradigm shift in the construction sector.

1.4 To ensure a robust process, MoHUA conducted a series of consultations with range of stakeholders to identify broad reasons for the slow and limited adoption of innovative and alternative construction technologies for affordable housing. Based on the feedback received and subsequent deliberations, the issues identified includes ensuring the suitability of foreign technologies for Indian conditions, certification and standardization including the requirement of proper specifications and codes, challenges in the procurement process, and the necessary policy support to synergize both demand and supply.

1.5 Typically conventional construction systems (such as the use of brick and mortar) are slow paced, energy intensive, dependent on natural resources and have a large carbon footprint. The entry of innovative and alternative construction technologies in India has been gaining usage, and while these technologies have entered the market, its acceptance and adoption needs to be enhanced. For this

a concerted effort is required to create mass awareness to accept a technology transition from conventional to new technologies through lighthouse projects, expositions and other outreach methods that will mainstream its use.

1.6 This transition will contribute towards achieving the ‘Sustainable Development Goals’ (SDGs) as laid out by the United Nations (UN), the ‘New Urban Agenda’ and the ‘Paris Climate Accord’ to which India is a signatory and other such international commitments. Such a technology transition aligns well with the vision of ‘New India 2022’.

2 OBJECTIVE OF GHTC-INDIA

2.1 MoHUA has initiated the Global Housing Technology Challenge- India (GHTC-India) which aims to identify and mainstream a basket of innovative construction technologies from across the globe for housing construction sector that are sustainable, eco-friendly and disaster-resilient. They are to be cost effective and speedier while enabling the quality construction of houses, meeting diverse geo-climatic conditions and desired functional needs. Future technologies will also be supported to foster an environment of research and development in the country. GHTC- India aspires to develop an eco-system to deliver on the technological challenges of the housing construction sector in a holistic manner.

3 Components of GHTC – India

The challenge has the following three components:

3.1 Component-1: Grand Expo and Conference

- i) Grand Expo-cum-Conference will be organized biennially to provide a platform to all stakeholders associated with housing construction for the exchange of knowledge and business.
- ii) Proven Demonstrable Technology providers from across the globe and domestic Potential Future Technologies will be invited to the Expo through a simple online screening process and a Technical Evaluation Committee (TEC) constituted for GHTC-India will evaluate and assess the range of technologies available.
- iii) Other stakeholders such as Research and Development (R&D) Institutes, academia, students of technical institutes, technologists, engineers, architects, government agencies including State Public Works Departments (PWDs) and Housing Boards, developers, entrepreneurs etc. will also be invited to participate as delegates. Developers and construction companies who may serve as Indian Partners to provide local logistic support in execution of the projects on ground (in partnership with global technology providers) will also be invited through a simple registration process.
- iv) Various events such as seminars, panel discussions, MoU Exchange among the partners, exhibition of prototypes, posters, digital interfaces, awards ceremonies and the display of PMAY (U) projects will be envisaged.

v) Networking opportunities may be explored at expo such as for Business to Business (B2B), Business to Government (B2G) and Government to Government (G2G).

3.2 Component-2: Proven Demonstrable Technologies for the Construction of Lighthouse Projects

3.2.1 Stream 1: Proven Demonstrable Technologies

i) Proven Demonstrable Technologies will be invited through an Expression of Interest (EoI) from across the world which are suitable for use in the Indian context. The applications will initially be screened to participate in the Grand-Expo-Conference, where the applicants will interact with the TEC.

ii) Post the expo, the TEC through rigorous assessments will shortlist and empanel a basket of technologies that could be considered for demonstration through actual on ground implementation of six lighthouse projects located in six sites across of the country. Criterion such as scalability, adaptability, sustainability and safety will be used for evaluating the proven technologies.

iii) Upon selection of six sites for the implementation of lighthouse projects the empaneled basket of technologies will be sorted site wise by the TEC. This sorting will ensure location specific exclusive technologies as per the respective site's geo climatic conditions. These selected technology providers will be invited through a tender process to bid and construct a complete affordable housing project on approximately 1- 2 hectares of land, which is expected to accommodate about 1,000 houses at each selected location. The key challenge parameters for selection are the ability of the technology to deliver maximum number of dwelling units in minimum time and in optimum cost. Technology providers will be encouraged to transfer technologies and shall provide technical support and capacity building.

iv) Request for Proposal (RFP) for construction of six lighthouse projects under GHTC-India will be issued by MoHUA. Owing to the unique nature of the challenge and for effective coordination with States/UTs, evaluation of bids of all six regions will be done centrally by a Bid Evaluation Committee (BEC) to be constituted after issuance of RFP which would include a member from the concerned State/UT. It will be mandated that different sites will have different and exclusive technologies. The period of construction will be minimum 12 months from the date of handing over of sites after all approvals. Approvals will be accorded through a fast track process by the concerned State/UT Government.

v) Technology Providers successfully completing the construction of lighthouse projects within the stipulated 12 month period of the contract will be rewarded with USD 20,000 each. A further incentive for early completion is being

provided wherein technology providers that complete lighthouse projects in less than 12 months will receive an incrementally higher bonus of USD 2,000 for each less month than sanctioned 12months.

vi) These Lighthouse projects will serve as live laboratories for different aspects of transfer of technology to the field. This includes planning, design, production of components, construction practices and testing for both faculty and students of IITs/ NITs/ Engineering colleges/ Planning and Architecture colleges, builders, professionals of private and public sectors and other relevant stakeholders. For this purpose, periodic interactions, webcasting etc. will be organized.

3.2.2 Stream 2: For States and Union Territories (UTs)

i. States / UTs will participate in Component 2 through a Terms of Reference (ToR) and evaluated by TEC. Participating States/ UTs will provide encumbrance free and adequately serviced land of preferably 1- 2 hectares while committing to comprehensive operational assistance for the construction of these light house projects. The State/UT will facilitate relaxation of development control regulations, fast-track approvals and certifications for speedy construction, setting up of a new technology construction components factory ensure fund availability and finalize beneficiary identification and.

ii. For the subsequent allotment of constructed houses to the beneficiaries in States/ UTs, procedures of existing guidelines of PMAY (U) will be followed as PMAY (U) guidelines.

3.3 Component-3: Potential Future Technologies for Incubation and Acceleration Support

i) For those upcoming Indian technologies in the housing sector, that demonstrate potential, but need assistance to mainstream their product in the market or need more technical handholding/ improvements to reach a viable product, acceleration and incubation support will be provided.

ii) Shortlisted potential technologies that are market ready (*post prototype applicants*) as evaluated by the TEC will receive Accelerator Workshops. These workshops and masterclasses will have sessions by Certification and Standards Agencies, Financial Institutions and Industry Leaders, and Marketing and Pitch Development Professionals and will serve as a fulcrum to connect various upcoming technology providers with the larger housing construction eco-system. The Accelerator workshops will be organized by Building Material and Technology Promotion Council (BMTPC) and WRI, India. Winners in the post prototype category will receive a cash award of USD 5,000 each and certification by appropriate level.

iii) Shortlisted potential technologies that are not yet market ready (*pre-prototype applicants*) as evaluated by the TEC will receive Incubation Support. Through the Affordable Sustainable Housing Accelerators- India (ASHA-India) initiative, Incubation Centers will be set up in 4 IITs (Bombay, Kharagpur, Madras and Roorkee). These IITs will provide mentoring, workshop and testing facilities, IPR support, financial advice, networking support and branding. These IITs will create further facilities, which may be essential for validation of technologies for structural safety, acoustic, thermal and other important parameters against the requirements given in the National Building Code of India/relevant Indian Standard as recommended by BMTPC and approved by Central Sanctioning and Monitoring Committee (CSMC). Incubation Grant to facilitate the conduct and structuring of incubation and accelerator programs will be given by MHUA after approval of CSMC.

v) The ASHA-India Centers will also help in developing design guidelines, construction manuals and other necessary guidelines, relevant for effective use of such technologies in the region.

4 Convergence with other Missions and Schemes

The GHTC- India will also converge with other existing centrally sponsored schemes and Missions such as Smart Cities Mission, Atal Mission for Rejuvenation and Urban Transformation (AMRUT), Swachh Bharat (U), Pradhan Mantri Awas Yojana-Urban (PMAY -U), National Urban Livelihood Mission (NULM), Ujjwala, Ujala, Make in India, Atal Innovation Mission (AIM), Skill India Mission amongst others.

5 Funding for Light house projects:

The funding for the Light house projects constructed under GHTC-India will be as per the guidelines of PMAY (U). However, in order to offset costs of the transition (opportunity cost) from conventional to new construction technologies the selected States/ UTs shall receive an additional Technology Innovation Grant (TIG) from MoHUA. The funding structure of Light house projects (per dwelling unit) will be as follows:-

- **Central Assistance:** INR 1.50 lakh per dwelling unit from MoHUA
- **State/ ULB/ Implementing Agency Share:** As applicable
- **TIG:** Up to Rs. 2.00 lakh per dwelling unit or 20% of the estimated cost per dwelling unit, whichever is less
- **Beneficiary Share:** As applicable

Award of TIG shall be contingent on the States/ UTs securing required clearances, certifications, and approvals etc. for the use of new construction technologies locally. State/UT shall earmark additional funds for executing these Light house projects under GHTC-India as per the guidelines of PMAY (U) in State/ UT budget.

6 Administration of GHTC-India

- i) GHTC-India is being administered by the MoHUA and Joint Secretary and Mission Director (Housing for All) as the nodal officer for conducting the challenge.
- ii) An Empowered Committee (EC) under the Chairmanship of Secretary, MoHUA is empowered to take all relevant decisions for GHTC-India.
- iii) A Technical Evaluation Committee (TEC) under the Chairmanship of the Director General, CPWD, is constituted for screening of applications and detailed evaluation of proven and potential technologies amongst others.
- iv) World Resource Institute (WRI), India and NAREDCO are associated as the Knowledge Partners for GHTC-India.
- v) Bloomberg Philanthropies (BP) is strategic partner. Other collaborators of national and international repute such as Indian Institute of Technologies (IITs), National Institute of Technologies (NITs), National Institute of Urban Affairs (NIUA), Massachusetts Institute of Technology (MIT), Confederation of India Industries (CII) International Finance Corporation-World Bank Group etc. willing to associate in GHTC- India and further will be on-boarded as Associate Knowledge Partners (AKPs). All Associate Knowledge Partners will be on-boarded on no cost basis.
- vi) Complete documentation of the GHTC-India will be ensured for future reference and learning.

7 Expected Outcome of GHTC-India

GHTC- India will be win-win for all the participating stakeholders due to the following envisaged outcomes: -

1. For Central Government Agencies: -

- i. Apart from achieving the goal of Housing For All (Urban), it will contribute towards fulfilling the vision of Hon'ble Prime Minister of India of "Make in India" and "Skill India".
- ii. Contributing toward fulfillment of SDGs and other national and international commitments.
- iii. Central Government Agencies to be benefited through latest housing technology knowhow, and mainstreaming of innovative and alternative technologies.

2. For States/UTs: -

- i. Readily available empaneled basket of technologies that are suitable for implementation in Indian context.
- ii. Prestige of winning the Global Challenge and implementing housing project that showcases innovative and alternative technologies, which will serve as lighthouse projects for future deployment.
- iii. Additional TIG along with existing PMAY (U) contribution.

3. For Global Technology Providers: -

- i. Benefit from innovative and alternative technologies being incorporated in Schedule of Rates (SoRs) and standards, receiving certifications and fast track approvals.

- ii. Opportunity to implement the innovative technology on ground as a housing project approved by the government.
- iii. Providing an impetus to set up large scale production units potentially resulting in adoption of innovative and alternative technologies in the Indian construction industry.

4. For Local Indian Partners and Developers: -

- i. Opportunity to form consortiums with Global technology providers.
- ii. Exposure to international construction practices and knowhow.
- iii. Unleash tremendous business opportunities.
- iv. Growth of ancillary industries and provide the required skill set in the innovative and alternative construction regime.

5. For Emerging Technology Providers: -

- i. Opportunity to showcase the emerging technologies at the Expo.
- ii. Receive mentoring at premier technical institutes, networking with key certification and standardization agencies.

6. For Academic Institutions and Students: -

- i. Incubation Grant to facilitate the conduct and structuring of incubation and accelerator programs.
- ii. Promotion of technological knowhow and skills as included in academic curriculum for research students and other relevant stakeholders.

7. Laborers and Beneficiaries: -

- i. Laborers will gain from being trained and skill enabled for employment in modernized construction industry that is envisaged by MoHUA, thereby accessing higher paying jobs.
- ii. Through GHTC-India beneficiaries (house owners) will have access to improved living conditions and environment with a sense of dignity in line with the vision of our Hon'ble Prime Minister to provide Housing for All by 2022.

An official website for accessing further information about GHTC-India and receipt of applications from Proven Technology Providers and domestic Potential Technology Providers, has been created as follows: <http://ghtc-india.gov.in/>

Connect us at:

-  ghtc-india.gov.in
-  support-ghtc.india@gov.in
-  [@GhtcIndia](https://twitter.com/GhtcIndia)
-  facebook.com/ghtc.india
-  linkedin.com/in/ghtc-india



GLOBAL
HOUSING
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CHALLENGE INDIA

Construction Technology India, 2019 Expo-cum-Conference Agenda

DAY 1: 2 nd MARCH 2019	
0800 – 1000 hrs	Registration
1000 – 1100 hrs	Inaugural Session
1000 hrs	Hon'ble Prime Minister Arrives
1000 – 1015 hrs	Visit of Exhibition Area by Hon'ble Prime Minister
1017 hrs	Hon'ble Prime Minister arrives at Dias
1017 – 1020 hrs	Welcome by the Secretary, Ministry of Housing and Urban Affairs
1020 – 1025 hrs	Remarks on Transforming India by the Hon'ble Minister (I/C), Housing and Urban Affairs
1025 – 1030 hrs	Video on GHTC- India, Release of Books etc.
1030 – 1100 hrs	Inaugural Address by the Hon'ble Prime Minister
1100 hrs	Hon'ble Prime Minister Departs
1100 – 1130 hrs	Tea Break
1130 – 1230 hrs	Plenary Session 1: Opportunities in Indian Urban Housing/ Real Estate Sector and Regulatory Systems
1130 –1140 hrs	1) Regulatory Reforms in India (Presentation by Secretary, MoHUA)
1140 –1200 hrs	2) Opportunities in Indian Housing Sector (Key Note Address)
1200 –1230 hrs	3) Q & A Panelists: <ul style="list-style-type: none"> a) Dr Niranjana Hiranandani, President, National Real Estate Development Council (NAREDCO)- b) Jaxay Shah, President, Confederation of Real Estate Developers Associations of India (CREDAI) c) Rakesh Bharti Mittal, President, Confederation of Indian Industry (CII) d) Durga Shanker Mishra, Secretary, MoHUA (Moderator)
1230 – 1330 hrs	Parallel Session- 1
1230 –1330 hrs	1) Interaction between Technical Evaluation Committee (TEC) and Proven Technology Providers- (15 minutes for each presentation)
	2) Interaction between Expert Jury and Potential Technology Providers- (15 minutes for each presentation)
	a) Ensuring Livability and Desirability of Affordable Housing Panelists: <ul style="list-style-type: none"> b) Abhay Bakre- Director General, Bureau of Energy Efficiency c) Prof C. V. R. Murthy, Dept. of Civil Engineering, IIT Madras d) Sanjay Seth - GRIHA Council & Sustainable Habitat Division-TERI e) Sameep Padora- Founding Director, sP+a Architects f) Ms. Sigrid Zialcita, CEO, Asia Pacific Real Estate Association (APREA) g) Prof. Dr. P.S.N. Rao – Director, SPA Delhi (Moderator)
1330 – 1430 hrs	Lunch Break
1430 – 1600 hrs	Parallel Session - 2
1430 – 1600 hrs	1) Interaction between Technical Evaluation Committee (TEC) and Proven Technology Providers- (15 minutes for each presentation)

	2) Interaction between Expert Jury and Potential Technology Providers- (15 minutes for each presentation)
1430 – 1515 hrs	3) Skills and Human resources required for Technology Transition Panelists: a) Manish Kumar, Managing Director & Chief Executive Officer, National Skill development Corporation (NSDC) <i>TBC</i> b) Dr. P.R. Swarup, Director General, Construction Industry Development Council (CIDC) c) Thiru S.Krishnan, Principal Secretary, Tamil Nadu d) Prof. Jagan Shah, Director, National Institute of Urban Affairs (Moderator)
1515 – 1600 hrs	4) Joining the Dots: Enabling an Eco-system for New Technologies in India- Opportunities and Challenges Panelists: a) Prabhakar Singh, Director General, Central Public Works Department (CPWD)- <u>Opening Remarks</u> b) Dr. N. Gopalakrishnan, Director, Central Building Research Institute (CBRI) c) Dr. Paresh Shah, Dean, Faculty of Technology, Centre for Environmental Planning and Technology (CEPT) University d) Dr. A. Mehar Presad, Professor, Structural Engineering Division, IIT Madras e) Dr. Shailesh Kr. Agrawal, Executive Director, Building Material and Technology Promotion council (BMTPC) (Moderator)
1600 – 1630 hrs	Tea Break
1630 – 1730 hrs	Plenary Session 2: Initiatives by State/UT to Promote New technologies for Affordable Housing
1630 – 1640 hrs	1. Journey of Pradhan Mantri Awas Yojana- Urban Mission & Overview of Light house Projects (Presentation by Joint Secretary & Mission Director - HFA)
1640 – 1710 hrs	2. Features of the Proposed Sites for Lighthouse Projects (Presentation by Principal Secretaries of Urban Development/ Housing Department of selected States/ UTs)
1710 – 1730 hrs	3. Exchange of Ideas & Feedback (Moderator- Christofer Nelson, Scholar on Innovation and Program Manager for Science in the Public Interest at Georgetown University) <i>TBC</i>

DAY 2: 3rd MARCH 2019	
0900 – 1000 hrs	Registration
1000 – 1130 hrs	Plenary Session 3: Disruptive Technology for India's Transformation
1000 – 1020 hrs	1) Keynote Address by CEO, NITI Aayog (TBC)
1020 – 1040 hrs	2) Talk on "Use of Digital Technology to Empower Communities to Plan and Build Better" by Marco Ferrario, Founder, mHS CITY LAB <i>TBC</i>
1040 – 1130 hrs	3) Discussion Panelists: a) Prof Michael Riley- Liverpool John Moores University UK b) Dr Aniruddha Dasgupta- Global Director, Sustainable Cities, WRI Washington c) Vijay Shirke, Managing Director, BG Shirke Construction Technology Pvt Ltd d) Christofer Nelson, Scholar on Innovation and Program Manager for Science in the Public Interest at Georgetown University (Moderator) <i>TBC</i> e) Mr. Philip Yang, Founder, Institute of Urbanism and Studies for the Metropolis (URBEM) <i>TBC</i>
1130 – 1200 hrs	Tea Break

1200 – 1330 hrs	Parallel Session - 1
1200 – 1330 hrs	1. Interaction between Technical Evaluation Committee (TEC) and Proven Technology Providers- (15 minutes for each presentation)
	2. Interaction between Expert Jury and Potential Technology Providers- (15 minutes for each presentation)
	3. World Café: Interactive Session Between Group of Stakeholders (Between Global Technology Providers, Indian Counterparts, State Govt. to lead to a Technology Transition in the Indian Construction Sector through Light house projects) Moderated by – Dr. Aniruddha Dasgupta- Global Director, Sustainable Cities, WRI Washington
1330 – 1430 hrs	Lunch Break
1430 – 1600 hrs	Parallel Session - 2
1430 – 1600 hrs	1. Interaction between Technical Evaluation Committee (TEC) and Proven Technology Providers- (15 minutes for each presentation)
	2. Interaction between Expert Jury and Potential Technology Providers- (15 minutes for each presentation)
	3. Innovation in Construction Equipment Manufacturing Sector to enable a Sustainable Technology Transition Panelists: a) Rufus Logan, commercial director-India, British Research Establishment (BRE), UK b) Suresh Patil, Head RMC, Ultratech Cement Ltd c) Vivekanand Vanmeeganathan, Country Head and Managing Director, Caterpillar India -TBC d) Arvind K. Garg, Executive Vice President and Head, Construction and Mining Machinery, Larsen & Toubro Ltd., (Moderator) e) Vijay Agarwal, Chairman & Managing Director, ACE - Action Construction Equipment Limited
1600 – 1630 hrs	Tea Break
1630 – 1715 hrs	Plenary Session 4: New Technology in Construction of Housing and other Buildings Beyond PMAY(U)
1630 – 1715 hrs	1. Presentation on Opportunities for Housing Construction from respective Ministries Panelists: a) Secretary, Ministry of Industry and Commerce TBC b) Secretary, Skill Development and Entrepreneurship TBC c) Secretary, Ministry of HRD TBC d) Secretary, Ministry of Home Affairs TBC e) Secretary, Environment Forest and Climate TBC f) Secretary, Defense TBC
	2. Q &A with Audience (Moderation by- O.P Agrawal, WRI)
1715 – 1730 hrs	Concluding Session
1715 – 1730 hrs	Concluding Remarks by Hon'ble Minister (I/C), Housing and Urban Affairs - Roadmap ahead for GHTC- India
