



Solar Decathlon India

Competition Guide 2022-2023

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Solar[™]
Decathlon
India



IUSSTF



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INDIAN INSTITUTE FOR
HUMAN SETTLEMENTS



Alliance for an
Energy Efficient
Economy

Table of Contents

Table of Contents	1
1. Introduction	4
2. The Challenge	5
Tasks.....	5
Guidance on forming a team	5
Institution and student qualification.....	5
Faculty Lead and Faculty Advisors.....	5
Registration and fees.....	5
Project Partner	6
Industry Partners	6
3. Competition Divisions	7
Multi-family housing	7
Single-family housing.....	7
Educational building.....	8
Office building.....	9
Community resilience shelter	10
On-site construction worker housing.....	11
4. The Ten Contests and their Requirements	13
Energy Performance	13
Water Performance.....	13
Embodied Carbon	14
Resilience	15
Engineering and operations	15
Architectural design	16
Affordability	16
Innovation.....	17
Health and wellbeing	17
Value proposition	18
5. Schedule.....	19
Deliverables and due dates.....	19

Events	19
6. Benefits	21
7. Judging.....	22
Judging criteria.....	22
Judging process	22
8. Resources available to teams	23
Technical Resource Group.....	23
Online learning modules	23
Energy simulation software.....	23
Guidance for pitching to Project Partners.....	23
Past submissions.....	24
Faculty Guide	24
9. Solar Decathlon India deliverable details.....	25
Format requirements for reports	25
Details for Deliverable 1	26
Preliminary Report.....	26
Feedback Criteria	28
Details for Deliverable 2	29
Predesign Analysis and Concept Report.....	29
Feedback Criteria	31
Details for Deliverable 3	33
Intermediate Report	33
Intermediate Presentation.....	36
Feedback Criteria	37
Details for Deliverable 4	38
Final Design Report.....	39
Movie.....	42
Division Jury Presentation	42
Grand Jury Presentation.....	42
Poster.....	43
10. Appendix.....	44
A. Construction budget template.....	44
B. Guidance to approach Project Partner	44

C.	Guidance document on 'Goals and Strategies'.....	45
D.	Guidance document on 'Innovation'	48
11.	Version Control.....	51
12.	Terms and Conditions.....	52

1. Introduction

This is a guidance document to the participants of the Solar Decathlon India (SDI) 2022-23 Net Zero Building Challenge. It contains information about the competition divisions, ten contests, resources made available to the participating teams, requirements, and rules for this year's challenge.

SDI invites post-graduate and undergraduate students from Indian institutions to join forces to combat climate change. This is an opportunity for student teams to design net-zero-energy-water and climate-resilient buildings, contributing to real projects by partnering with leaders in real estate development. SDI helps students stay a step ahead and introduce innovative, affordable, and market-ready solutions that enable a clean energy transition. This is the resilient and carbon-neutral way forward for sustainable buildings and communities in India. SDI is conducted by the Indian Institute for Human Settlements (IIHS) and the Alliance for an Energy Efficiency Economy (AEEE) under the aegis of the Indo-US Science and Technology Forum (IUSSTF).

India is the third-largest carbon emitter, accounting for 7% of global emissions in 2020. Summer temperatures in many cities cross 40°C, and extreme weather events leave large sections of the population vulnerable to climate change risks. Urbanisation and economic growth will lead to 70% more building stock by 2050. Cooling demand is expected to grow 15-fold in the next 20 years. At COP26 in 2021, India declared its '*Panchamrit*' goals to achieve net-zero by 2070. To achieve and accelerate these goals, solutions for resilient net-zero energy buildings (NZEB) need to be implemented at a large scale. To that end, SDI focuses on creating capacity amongst students and creating partnerships with the industry.

SDI provides the platform and resources necessary for students to learn and design net-zero buildings and contribute to a sustainable future. They get hands-on experience by developing practical, innovative solutions for real buildings and learn how to make their solutions market-ready.

2. The Challenge

Teams design affordable and net-zero buildings for real building projects by partnering with building owners and real estate developers.

Tasks

- a. Read this Competition Guide and form a team.
- b. Register your team.
- c. Identify a Project Partner to select an appropriate project.
- d. Ensure that all team members complete all mandatory online learning modules
- e. Study the resources listed in this guide.
- f. Identify industry partnerships for the areas of the competition that need collaboration.
- g. Consult the SDI [website](#) for updates and announcements.
- h. Design and document your work, in compliance with the requirements listed in this guide, and its subsequent updates.
- i. Submit all deliverables before the deadlines.

Guidance on forming a team

Institution and student qualification

Post-graduate and undergraduate students from any Indian educational institution may form a team. Each team must be multidisciplinary, with at least one student with a background in architecture/building science and one in engineering. Students from multiple colleges can collaborate to form a team. You are encouraged to include students of diverse disciplines in your team. A team can have a minimum of 5 and a maximum of 15 students. Each team must have a student Team Lead and a Faculty Lead.

Faculty Lead and Faculty Advisors

The Faculty Lead, along with the Team Lead, is responsible for communicating competition details from the SDI organisers to the team members. A team may have other faculty members as Faculty Advisors, but the Faculty Lead will serve as the primary contact and undertake the responsibility for students completing the online training modules. If multiple institutions are collaborating to form a team, you are recommended to have at least one faculty advisor from each institution. Faculty leads and advisors should review their team's work before it is submitted to SDI.

Registration and fees

Team Leads will register their teams on the portal which can be accessed through the [website](#). The competition/registration fee for the 2022-2023 Challenge is INR 6,000 (inclusive all taxes) per team, which is non-refundable.

Project Partner

Each team must partner with a building owner or real estate developer, whose project they will work on. The team should collect information about the project site, project brief, any financial and other constraints, to make the project as realistic as possible. Teams may also benefit from providing regular updates to their Project Partners and taking their feedback.

Industry Partners

Teams are encouraged to seek out Industry Partners to work towards market-ready solutions using the latest technologies. Industry partners can also help with factors like affordability, constructability, and innovation. Teams are also encouraged to partner with industry professionals such as architects, engineers, service providers, manufacturers, energy-efficiency experts, and local authorities, in areas like building codes, construction, material, HVAC systems, lighting systems, and financing. These partners can help with the decision-making and review the work.

3. Competition Divisions

Teams can choose to compete in any one of the following Divisions in the 2022-23 challenge. Projects should comply with the byelaws, codes, and standards governing regulations such as ground coverage, setbacks, minimum room size, fire protection requirements, service locations and quantities, and other specific requirements. Retrofits of existing buildings are not allowed in this year's competition.

Multi-family housing

Multifamily housing is projected to have exponential growth in over the next 20 years. At 24%, housing is the second largest electricity consuming sector in India. Affordable and mid-range housing will lead demand, supported by government policy. The need for cooling and energy will rise multi-folds in next few decades. Net-zero and resilient building innovation are needed for sustainable growth of this sector. This can also contribute to the Sustainable Development Goals (SDGs). This Division can impact millions of people giving access to affordable homes, with clean and reliable energy, making a positive impact on their health and well-being.

Multi-family housing is defined as:

- 'Residential buildings' that are built on a plot area $\geq 500 \text{ m}^2$, OR
- The residential part of a 'mixed land-use development project', built on a plot area of $\geq 500 \text{ m}^2$.

Projects can range from affordable housing to high-end housing, with the following requirements:

- a. Minimum carpet area of 21 m^2 per dwelling unit.
- b. Minimum of eight attached dwelling units. No maximum plot size.
- c. For mixed-use projects, at least 70% of the occupiable area of the building must be used for dwelling units. Do not include parking areas to determine if the building programme meets the 70% threshold.
- d. The design should be able to maintain temperatures as per the thermal comfort standard and indoor air quality in all bedrooms, living rooms and kitchens during occupied hours. You are required to provide active cooling if passive cooling strategies are not adequate to maintain thermal comfort.

If the Project Partner's programme requires additional community services, teams may limit their energy and water performance calculations to residential dwelling units only.

Single-family housing

Single-family housing, at the high-end of the market as well as affordable homes, including those built under PMAY scheme are in demand despite the strong growth in multifamily housing. This housing type is as vulnerable as, if not more than multifamily housing, to the hazards of flooding and other hydro-meteorological events. Rising

temperatures due to climate change increase cooling energy demand. This Division provides the opportunity for replicable and scalable solutions to achieve resilient, net-zero-energy-water housing.

In this year's challenge, single-family housing is defined as a standalone detached structure or a semi-detached structure that abuts another house, and that is intended to be occupied by a single family with the following requirements:

- a. The site should be part of plotted development approved by the Department of Town and Country Planning or local development authority.
- b. Plot area < 500 m². There is no restriction on minimum plot size.
- c. Carpet area > 30 m².
- d. Replicability and scalability should be addressed by demonstrating how the design can be adapted to different locations within the plotted development, including but not limited to plots facing different orientations.
- e. Solutions provided may share building services and systems with other houses within the plotted development, however, revenue and cost accounting models for such shared services for CAPEX and OPEX should be provided.
- f. The design should be able to maintain temperatures as per the thermal comfort standard and indoor air quality in all bedrooms, living rooms and kitchens during occupied hours. You are required to provide active cooling if passive cooling strategies are not adequate to maintain thermal comfort.

Educational building

Access to clean water, education and infrastructure for children has been a challenge, where millions of children lack resources. Many classrooms in India are not able to provide the minimum level of thermal comfort, visual comfort, and clean air. When provided, the cost of construction and operation is high, resulting in high fees. Net-zero-energy-water educational buildings should ensure these at low CAPEX and OPEX and provide a resilient infrastructure for transitioning to the National Education Policy of 2020.

An educational building may range from primary schools and high schools to college buildings, with the following requirements:

- a. Total occupancy between 300 to 3,000 students; and 20 to 65 students per classroom.
- b. At least 50% of the building programme should be dedicated to teaching activities. Teaching activity areas include classrooms, labs, music/arts/crafts rooms, etc. Do not include parking areas to determine if the building programme meets the 50% threshold.
- c. Plot size: no minimum or maximum requirement.

- d. The design should maintain temperatures as per the thermal comfort standard and indoor air quality in all occupied areas during occupied hours. You are required to provide active cooling if passive cooling strategies are not adequate to maintain thermal comfort.

Office building

Commercial buildings have been one of the fastest growing real estate sectors. During 2019, the office leasing space reached 6 million m² across eight major cities of India, registering a growth of 27% year-on-year. This building type consumed 8.4% of the total electricity in 2018-19. Accepted as an attractive destination for IT and BPO services and estimated to contribute 13% to the GDP by 2025, the sector will increase greenhouse gas emissions. Net-zero-energy office buildings can surpass the minimum requirement of the Energy Conservation Building Code (ECBC) and dramatically reduce the energy consumption and carbon footprint while contributing to country's National Action Plan for Climate Change (NAPCC).

An office building is defined as a complete commercial facility or a government and semi-government office complex with full fit and finish for the defined client(s), including support functions such as mechanical and electrical spaces, circulation, vertical transportation, and toilets. Projects can range from a single tenant/user office building to co-working offices in the building to several tenant/users' offices in the building, with the following requirements.

- a. Building size: at least 1,000 m², and gross area of 10-30 m² per person
- b. At least 70% of the building programme should be dedicated to office spaces. Do not include parking areas to determine if the building programme meets the 70% threshold.
- c. Plot size: no minimum or maximum requirement
- d. Lobbies, conference rooms, meeting rooms, training rooms, breakout areas, reprographics/ break out areas/ cafeteria, and toilets should be included as appropriate.
- e. The design should be able to meet the thermal comfort standard and indoor air quality in all occupied areas during occupied hours. You are required to provide active cooling if passive cooling strategies are not adequate to maintain thermal comfort.

If the Project Partner's programme requires additional data centres, retail/shopping facilities, teams may limit their energy and water performance calculations to the office block.

Community resilience shelter

Community resilience shelters are used for emergency evacuation during extreme weather events like cyclones, floods, and earthquakes. They may be used to shelter disaster-affected people for short periods. Such a building should also house community service activities such as education, health training, and other income-generating social functions. Net-zero-energy-water solutions for these buildings makes them more resilient.

They could also serve as isolation centres at the community level during pandemics/ health crises such as COVID-19. We encourage teams to contact the State Disaster Management Authorities, local municipalities, or local development authorities to learn about planned and future projects.

Community resilience shelters are managed and owned by the communities in the long term, although they may be built by the government. These multipurpose shelters may ultimately become a 'community asset/resource' and create a broader impact on the livelihood of the community.

For this Division, teams may select projects to meet the following requirements:

- a. The shelter should be proposed after exploring the existing situation, surrounding environment, access to settlements (especially the most vulnerable), their workplaces, education facilities, health facilities, and markets.
- b. A site with sufficiently wide access that can be developed into an approach road. There is no minimum plot area required. Disability access must be considered.
- c. The approach road and the shelter should not be affected by the disaster. That is, they should also be structurally safe to survive the ensuing disaster. Teams are expected to identify disasters and extreme weather events to respond to, and design to mitigate those.
- d. The shelter should have services like lighting, ventilation, communications, food, water, and sanitation, even at the time of a disaster.
- e. Minimum amenities required are toilets, drinking water supply, storage for valuables, and emergency food and cooking supplies.
- f. Social conditions must be addressed including separate spaces for different genders (alternatively, families with young children). Barrier-free access must be considered especially for people from different religions, castes, languages backgrounds, genders, age groups, and abilities. There may also be a need to shelter pets, cattle, or other animals.
- g. The minimum built-up area should be 200 m² or the ability to provide shelter for 200 persons. If the project brief or the community needs justify a smaller built-up area or lower occupancy, teams should clearly document the rationale in their project reports.

- h. Shelter rooms should be planned for at least 1 m² per person. Note that disabled people may require more space. Provide at least 1 toilet per 40 people in the shelter, with freshwater supply and appropriate wastewater treatment.
- i. The shelter should be able to operate during a 'lockdown period' of 60 hours.
- j. The shelter should serve as a community usable space during non-disaster, extreme event times. This will require an assessment of community needs.
- k. As a net-zero-energy and net-zero-water facility, the shelter can be grid-connected during normal times and should function off-grid during disaster events.
- l. The design should maintain temperatures as per the thermal comfort standard in all the occupied areas during occupied hours. You are required to provide active cooling if passive cooling strategies are not adequate to maintain thermal comfort.

On-site construction worker housing

Typically, construction workers are migrants and stay on-site anywhere between 3 months to 3 years in poorly constructed temporary shelters, without proper hygiene or comfort. These temporary shelters do not have stable electric supply and workers burn fossil fuels for cooking and heating. Meanwhile we expect large amounts of construction to take place in the next 3 decades.

All this warrants an approach to on-site housing for construction workers to provide hygiene and thermal comfort. This Division will focus on solutions that are modular, movable, and eliminate waste. They will be developed to be resilient, net-zero-energy and net-zero-water. Teams will develop the building program in consultation with their Project Partner and comply with the Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996. Teams can also refer to the guidance note - "*Workers' accommodation: processes and standards*" by International Finance Corporation (IFC) and European Bank for Reconstruction and Development (EBRD).

For this division, the teams requirements apply:

- a. Plot Size: no minimum or maximum requirement. However, the design should be demonstrated on an ongoing or proposed construction site with a vehicular approach road. In addition, the design should be adaptable to other sites.
- b. The entire facility, including the structure, renewable energy system, water, and waste processing, should be modular, scalable, dismantlable, transportable and reusable. The dismantling and relocation should result in zero construction waste on-site. The ease and speed of assembly and disassembly should be an important consideration.
- c. The modular approach should ensure that the designs are developed to accommodate a range of sizes for the workers' community, from as low as 30 workers to larger than 300.

- d. The modular design needs to include the possibility of small families and shared spaces for groups.
- e. All units should have adequate lighting, ventilation with minimum floor space of 5 m² per occupant.
- f. Separate bathing, toilets, clothes washing areas for men and women, need to be provided. Provide at least one toilet for every ten persons, or as per the local byelaws.
- g. In addition, provide community facilities such as common kitchens with renewable fuels and childcare areas as appropriate.
- h. Social conditions must be addressed including separate spaces for single males and single females. Barrier-free access must be considered especially for people from different religions, castes, languages, gender, age, and ability.
- i. The design should be developed to maintain indoor temperatures as per the thermal comfort standard for occupied hours in *sleeping areas*. You are required to provide active cooling if passive cooling strategies are not adequate to maintain thermal comfort.

4. The Ten Contests and their Requirements

Teams must address all ten contests in their proposed designs.

Note: The requirements marked with * will be evaluated in Deliverable 3 and all requirements will be evaluated in Deliverable 4. Please see Chapter 9 ('Deliverable Outline') for the detailed outline for each Deliverable.

Energy Performance

This contest evaluates net-zero building design as a super-efficient building that generates renewable energy on site. In a net-zero energy building, the total renewable energy generated annually on site should be equal to or more than the total annual energy consumption of the building. The capability of the building systems to interact with the electricity grid, with on-site or stored power is also important. A whole building approach to performance is needed, including strategies to reduce heating and cooling loads, integration of daylighting and passive systems, efficient electric lights, and appliances, as well as low-energy and efficient cooling systems. Building energy modelling and simulations should inform design decisions.

The contest requirements are:

Low Energy Performance Index with

- ***Reduction of loads** demonstrated with annual energy analysis against the baseline scenario for each strategy separately, for passive design, building envelope, lighting and plug loads
- ***Integration of low energy comfort systems** demonstrated with annual energy analysis against the baseline scenario.

Net-zero annual energy use with

- **Integration of sufficient renewable energy generation on site** to offset non-renewable energy sources, demonstrated through renewable energy generation calculations
- **Smart grid interaction capabilities** including but not limited to demand-side response and distributed generation, to avert system stress and enhance grid reliability, demonstrated through a conceptual narrative and diagrams.

Water Performance

This contest evaluates a net-zero water building in terms of the design and management of on-site water resources towards a fully water-sufficient development. In a net-zero water building, the total water consumption is equal to or less than the sum of harvested rainwater used, recycled water used, and the treated wastewater returned to a source available to the public. Strategies for reducing water consumption and techniques for on-site water recycling and reuse need to be implemented. Different

water end-uses require different levels of water quality, and customization of filtration and treatment systems based on end-use should be considered. The water-cycle design should be supported by detailed water calculations.

The contest requirements are:

A low per capita water demand by

- ***Minimizing water usage** through clearly defined strategies for domestic consumption, irrigation, and utilities such as cooling, demonstrated through comprehensive annual water calculations and comparison with a baseline usage scenario as per the National Building Code.

Net-zero annual water performance with

- ***Sufficient use of harvested rainwater, recycled water, and treated wastewater returned to a public source**, demonstrated through clearly defined strategies and comprehensive annual water cycle calculations.
- ***Optimisation of on-site storage and recharge of groundwater**, demonstrated through clearly defined strategies and calculations for seasonal variations and availability during natural disasters.

Embodied Carbon

This contest evaluates the design for the use of building materials and construction technologies that reduce embodied carbon emissions, which is essential for net-zero global emissions. This contest includes embodied carbon emissions that result from the burning of fossil fuels in the mining, extraction, processing, manufacture, and transportation of building materials delivered to the building site. Teams should incorporate strategies to reduce embodied carbon in five building systems: roofs, walls, floors, structure, and fenestration. Furniture, furnishing, finishes, landscape, sitework are not included in this contest. Research and incorporate building materials that reduce, eliminate or trap carbon. Teams should demonstrate through calculations, the reduction of carbon emissions in their design compared to a baseline.

The contest requirements are:

- ***Narrative of the low embodied carbon materials and construction technologies** used in the design.
- ***Reduction of embodied carbon** through calculations that compare the embodied carbon content in the proposed design with a baseline case for:
 - Roofs: functional unit as 1 m² in plan-view, for each roof system proposed
 - Walls: functional unit as 1 m² for each wall system proposed
 - Windows: functional unit as 1 m² for each window system proposed.
 - Floors: functional unit as 1 m² for each floor system proposed
 - Superstructure: functional unit as 1 m² of floorspace, for each structural system proposed

- **Construction details demonstrating integration of low embodied carbon materials and construction technologies** in the design.

Resilience

This contest evaluates the building's ability to adapt to changing environmental conditions and the ability to maintain functionality in the face of stress or disturbance. Incorporate strategies that provide resilience against seismic, hydrometeorological as well as public health hazards. Teams should aim for reducing risks by reducing exposure to hazards, vulnerability, and increasing preparedness. These approaches should provide resilience during an event, after the event, and result in long-term resilience. Onsite energy generation, water treatment and storage, providing comfort with passive design can minimize disruption of operation. Teams should also consider food security and resilience at a community level.

The contest requirements are:

- ***Assessment of potential risks** resulting from climate change, public health hazards and other natural disasters for the project and community, stress and disruptions to services such as energy, water, food security, and waste disposal. Assessment should be demonstrated through qualitative and quantitative analysis
- ***Improved physical integrity through** interventions in design and infrastructure to address the risks as listed above, demonstrated through drawings and narratives
- **Quantification of resilience** resulting from the design and infrastructure interventions, demonstrated through calculations for resilience metrics¹ of 1) passive performance and 2) autonomy for critical functions
- **Improved operational continuity** through a risk management and recovery plans to sustain operations and minimise stress and disruptions, during and after the event.

Engineering and operations

This contest evaluates the effective integration of high-performance engineering systems and understanding of building operation. Right-sizing and design of engineering systems help minimize waste of materials, equipment, and energy. Building systems, appliances, and features should be thoughtfully selected and integrated into the overall design. Structural engineering systems should be effectively integrated with architectural and other engineering systems. An intelligent approach to automation and adaptive control by occupants needs to be considered. Operations and maintenance (O&M) considerations should be developed into an O&M plan for the building.

For engineering systems of HVAC, electrical, water, structure, and solid waste management, the requirements are

¹Teams should refer to the 'Resilient Design' Self Learning Module for explanation of the resilience metrics.

- ***Engineering system design and right-sizing** explained with drawings, narratives, and calculations
- ***Space provision and architectural integration** explained with drawings
- ***Constructability at scale** in terms of availability of material, technology, and labour, explained with analysis and narratives.

And, for smart building operation, the requirements are

- **Building operation narrative** that lists the Do's and Don'ts for the proposed building systems, along with a list of key parameters to measure the performance of the building
- **Building automation and control** with control narratives and schematics

Architectural design

This contest evaluates the architectural design for its creativity, integration of systems, and ability to deliver functionality and aesthetic appeal desired by the market or client. Cutting-edge energy-efficient building performance is better positioned to achieve market acceptance when integrated into architectural designs that meet the aesthetic, functional and operational expectations of the industry and consumers. Teams are required to bring together aesthetics with sound building science, performance, comfort, affordability, and resilience.

The contest requirements are:

- ***Use of an integrated, evidence-based, and creative process**, explained with a narrative and visuals
- ***Generation of an appropriate aesthetic and user experience** for the end users, at site, building, and interiors, demonstrated through narratives and drawings
- ***Functionality and efficiency** in terms of circulation, space allocation, servicing, adjacencies, densities for the site, building, and interiors, demonstrated through narratives and drawings
- **Integration of building systems and enabling their performance** to respond to the other contests, for the site, building, and interiors, with narratives and drawings.

Affordability

This contest evaluates the building's financial costs for initial investment and ongoing operations. Teams are required to demonstrate rightsizing and optimization of systems to control the initial cost of high-performance buildings. Design strategies for obtaining economies in construction such as simplifying and integrating building assemblies and using local materials should be considered. Constructability in terms of availability of materials, technologies, and labour should be explained. Teams are encouraged to design the building to shorten the construction time and demonstrate the reduction in cost of financing. Teams are required to look at operations and maintenance for

lifecycle costs of high-performance building systems. Teams are encouraged to consider green finance options available to their project.

The contests requirements are:

- ***Construction cost analysis** for rightsizing, use of local or repurposed materials, and other strategies of the proposed design compared with a baseline design
- **Financing cost analysis** for faster construction methods in the proposed design compared with a baseline design
- **Lifecycle cost analysis** for total cost of ownership of select systems in the proposed design compared with a baseline design.

Innovation

This contest evaluates application of innovative techniques, technologies, or business models through creative approaches to enhance performance in other contest areas. It requires the team to identify *one* specific problem and present *one* innovation as a solution to that problem. Teams are encouraged to explore ongoing research and development activities within, or disruptive technologies outside the buildings sector. Teams are required to assess and present the readiness level of the technologies included in the solution. When a proposed solution goes beyond existing cutting-edge developments, where teams propose their own ideas, these require a demonstration of feasibility, and demonstration of whetting of the ideas by industry partners.

The contest requirements are:

- ***Complete narrative** with the 6 points in the Documentation Requirements of Appendix D,
- **Integration of innovation**, demonstrated in the proposed design.

Health and wellbeing

This contest evaluates the building's capability to provide thermal comfort and good indoor environmental quality, essential for ensuring occupant health and wellbeing. Teams can choose an adaptive thermal comfort model appropriate for their project and design the building to maintain that level of comfort. Passive design approaches can maximise annual comfort hours without the need for air-conditioning equipment. Teams should provide active cooling if passive cooling strategies are not adequate to maintain thermal comfort. Teams should provide fresh air ventilation as recommended by the National Building Code of India. This will include a comprehensive approach to indoor air quality that incorporates ventilation, filtration, dilution, and material selection strategies.

The contest requirements are:

For thermal comfort

- ***Provision of indoor thermal comfort** based on a chosen standard, with description of strategies for all modes of operation of the building
- ***Annual simulations demonstrating thermal comfort** achieved in key spaces during occupied hours and for each mode of operation
- **Strategies for reducing thermal stress in the outdoor environment** and minimising thermal shock in transitional spaces.

For ventilation and air quality

- ***Provision of desired indoor air quality, and adequate fresh air** with design and description of strategies, airflow network diagrams, natural and mechanical ventilation modes of operation along with their operation schedules
- **Simulations or sizing calculations** to achieve the above for natural and mechanical ventilation modes of operation.

Value proposition

This contest evaluates the team's ability to convey the value proposition of the proposed solution to the Project Partner and end users of the building. The value proposition must have clear and simple statements that describe and quantify the tangible benefits and describe the intangible benefits. This should enable the Project Partner to understand why they should invest in the proposed solution, and the end users to understand why they should occupy the building.

The contest requirements are:

- ***Completeness and clarity** of the deliverable
- ***Compelling narrative for Project Partner** with clear messaging and articulation of the value proposition
- **Compelling narrative for end users** with clear messaging and articulation of the value proposition.

5. Schedule²

Solar Decathlon India 2022-23 Schedule

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	April	May	Jun
	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4
Registration												
Stage 1 Competition												
Learning Online												
Faculty Development Programme												
Deliverable 1: Preliminary Report												
Deliverable 2: Concept Design Report												
Stage 2 Competition												
Deliverable 3: Intermediate Report												
Finalists announced												
Deliverable 4: Final Report												
Deliverable 4: Movie												
Deliverable 4: Presentation & Posters												
Design Challenge Finals event												
Incubation Hub*												

* Details will be shared later

- Stage 1 of the competition formally begins on 30 August 2022. However, teams that register earlier are welcome to start working before that.
- Similarly, Stage 2 of the competition formally begins in January 2023. However, teams are welcome to start working on Stage 2 in December, soon after submitting Deliverable 2.

Deliverables and due dates

- Registration closes at 8 pm on 29 August 2022.
- Self-learning Modules to be completed by 5 pm on 9 January 2023.
- Deliverable 1: Due by 5 pm on 11 October 2022.
- Deliverable 2: Due by 5 pm on 28 November 2022.
- Deliverable 3: Due by 5 pm on 23 February 2023.
- Deliverable 4 - Final Design Report: Due by 5 pm on 17 April 2023.
- Deliverable 4 - Movie: Due by 5 pm on 1 May 2023.
- Deliverable 4 – Division Jury Presentation slides: Due by 5 pm on 10 May 2023.
- Grand Jury Presentation slides: Due by 5 pm on 10 May 2023.
- Posters: Due by 5 pm on 10 May 2023.

Events

- Faculty Development Programme for Faculty Leads and Faculty Advisors: 23 and 24 September 2022.
- ~~Mid-year conference for Faculty Leads and Faculty Advisors[‡]: 21, 22, and 23 December 2022.~~ (Note: This event has been cancelled and has been replaced with a Faculty Feedback meeting)

² This schedule may be subject to changes, keeping in mind COVID-19 realities, in accordance with relevant government directives from time to time.

- c. Ticket to Finals: The finalists' teams of the 2022-23 Challenge will be declared on 10 March 2023. Details of the event will be shared with faculty leads and team leads later.
- d. Design Challenge Finals[†]: The selected teams (finalists) will present their work during the Design Challenge Finals on 13 and 14 May 2023. Details of the event will be shared with faculty leads and team leads later.
- e. Grand Jury[†]: Division Winners will present their work in a 5-minute pitch to the Grand Jury on 14 May 2023. Division Winners will be announced on the morning of 14 May 2023.

[†] Format and nature of these events are subject to change due to the COVID-19 situation and government regulations on social-distancing.

6. Benefits

- a. **Alumni:** Alumni of Solar Decathlon India become part of a global alumni community of Solar Decathlon participants from other parts of the world. Team members of teams who submit Deliverable 3 are recognised as SDI alumni.
- b. **Career development:** As part of SDI, students gain real-world industry experience while working alongside project partners and implementing their ideas on live projects. The benefits of this are far-reaching and include developing industry connections, gaining exposure to multiple technologies, and being coached by mentors. SDI also conducts an internship fair which gives students from finalist teams access to organisations leading the work on climate action.
- c. **Trophies, cash prizes and certificates:** The winning teams in each competition division receive cash prizes, trophies, and recognition. The relevant Faculty Lead is responsible for distributing any cash prizes. The competition organisers are not responsible once the funds are disbursed to the team. The competition organisers only ask for details for transferring the funds, which must be signed off by the Faculty Lead. Participation does not guarantee any compensation or award. Team members receive a certificate upon completion of the Self Learning Modules.

7. Judging

The teams are assessed based on the Deliverables they submit. The deliverables should demonstrate the team’s ability to understand, design, analyse, plan, and communicate for a net-zero-energy- water, resilient and affordable building. The jurors evaluate the team’s work for the ten contests based on the criteria and process described below.

Judging criteria

All 10 contests carry equal weight. The jury evaluates the deliverable for each contest according to the following criteria:

Scale	Judging criteria
Excellent	Work exceeds expectations
Very Good	Work meets expectations and is of good quality
Good	Work meets minimum expectations
Fair	Work can meet minimum expectations with some improvement
Poor	Unacceptable and below expectations

Judging process

The judging process is described below:

- Deliverables 1 and 2 are not elimination rounds. These deliverables are milestones and convergence points for the teams to define their design problem and initial approach. A panel of reviewers provides feedback on Deliverables 1 and 2. Each team must include a ‘Response to Reviewer comments’ in Deliverables 2, 3, and 4 (see Section 9 of this document). Teams who fail to include this will not receive any feedback.
- Deliverable 3 is an elimination round, which is judged by a panel of experts as per the ‘Judging Criteria’. Teams should meet the contest requirements and follow the deliverable outline provided in Section 9. Up to six teams per Division will be selected as Finalists. The Finalists will submit Deliverable 4 and present their work to the jury at the Design Challenge Finals event.
- For Deliverable 4, a panel of three jurors will assess each Competition Division based on the judging criteria and select a winner and runner-up for each division.

8. Resources available to teams

Technical Resource Group

The teams can reach out to a group of people with specific technical expertise areas. The Technical Resource Group (TRG) members provide high-level guidance, point-out resources, and provide explanations to the teams. However, they do not solve problems for the teams. Each team will be assigned one TRG member as a mentor, who will be the first point-of-contact for the teams on technical issues related to their project. The assigned TRG member may point the team towards any other TRG members based on the nature of query of the team. The teams can schedule meetings with their assigned TRG member at a mutually agreed time. The list of TRG members is posted on the SDI [website](#), and their contact information is available on the Learning Management System (LMS). Teams can initiate contact with the TRG members through email. After receiving inputs from the TRG, teams are responsible for the design decisions taken by them. Neither the competition organisers nor the TRG members will be held responsible for those decisions.

Online learning modules

The teams are provided with online Self Learning Modules in technical topic areas related to building science, energy efficiency, renewable energy, water sufficiency, cost estimation, etc. The teams will also be provided access to recorded webinars by experts that describe case studies and best practices.

Energy simulation software

Each member of a team will be provided a license to DesignBuilder™ software for the duration of the challenge to carry out building performance simulations and test their design ideas. The SDI organisers provide the contact information of the participating students, Faculty Leads, and Faculty Advisors for teams to get access to the software licenses. The respective teams at their own risk and responsibility, will enter into relevant agreement(s) with DesignBuilder for use of the DesignBuilder™ software.

Each member of a team is also provided a license to ClimateStudio software for the duration of the challenge to carry out building performance simulations and test their design ideas.

Note: Although the organisers are providing access to DesignBuilder™ and ClimateStudio, teams are free to use any dynamic simulation modelling software of their choice.

Guidance for pitching to Project Partners

The SDI organisers provide a [handout](#) to the participating teams to explain to Project Partners the benefits they get and clarify their role and commitment. Teams should also refer to Appendix B for guidance to approach Project Partners.

Past submissions

Works submitted by teams who have participated in the past are posted on the SDI [website](#). The teams should review this work.

Faculty Guide

The SDI organisers provide a '[Faculty Guide](#)' document. This document explains the benefits to participating institutions and students. Faculty are encouraged to refer to this document to encourage student participation and seek alignment with their curriculum.

9. Solar Decathlon India deliverable details

This section provides detailed requirements of the Deliverables for the 2022-23 Challenge. Teams should submit all deliverables before the deadline and time, on the online Learning Management System (LMS).

- Failure to submit the deliverables before the deadline may lead to disqualification of the team from the competition.
- Failure to adhere to the prescribed length and structure (outline) of deliverables may lead to disqualification.

Format requirements for reports

For each deliverable, teams must follow the following format requirements.

1. **Page size:** Use Standard A4 size (210 mm X 297 mm)
2. **Fonts and text size:** Use 11-point font for body text (diagrams may have smaller fonts but must be readable). Your text should be left-aligned. You may choose your own font type, but please make sure it is easy to read. Embed the fonts in your PDF file.
3. **Margins:** Must be minimum of 1 inch on all four sides. However, figures, and images may bleed into the margins.
4. **Tables and figures:** Please number all tables and figures and provide captions for each. Do not just insert a table or figure. Introduce it in the text and refer to it by its number.
5. **File type, size, and page count:** See details for each deliverable.

Details for Deliverable 1

This section contains the requirements for **Deliverable 1** (i.e., the **Preliminary Report and Project Data Form**) for SDI 2022-23 challenge. Teams must strictly follow the instructions listed in Table 1, below.

Table 1: Solar Decathlon India Deliverable 1 - File Naming Conventions and Deadlines

Deliverable	Required Content	File Name	Deadline
Preliminary Report	Single Bookmarked PDF	D1_[DivisionLetterCode]_(TeamName).pdf For e.g., D1_MFY_TeamName.pdf D1_SFY_TeamName.pdf D1_EDU_TeamName.pdf D1_OFF_TeamName.pdf D1_CRS_TeamName.pdf D1_CWH_TeamName.pdf	3 - 11 October 2022, 5 pm IST
Project Data Form - 1	Form (accessible through the LMS)	D1_[DivisionLetterCode]_(TeamName)_ProjectData1	3 - 11 October 2022, 5 pm IST

Note: MFY = Multi-family housing; SFY = Single-family housing; EDU = Educational building; OFF = Office building; CRS = Community Resilience Shelter; CWH = On-site construction worker housing

Preliminary Report

The Preliminary Report shall have a team summary, approach, description of the project, the design approach, and some preliminary analysis. It should communicate the salient aspects of the team, its approach, and the project. We understand that for the initial submission, the project details could be tentative and may change in the future.

Teams must adhere to the page count and content outline provided below.

Page count and file size

1. Maximum page count: Not more than **13 pages**, excluding the Cover page and Appendix. Submissions exceeding 13 pages may not be reviewed for feedback.
2. File size: Less than **15 MB**.

Content Outline

Please follow this outline in terms of the content, order, and number of pages allowed.

1. **Cover page** (must have the following content at a minimum)
 - a. Logo of Solar Decathlon India
 - b. Name of your institution(s)
 - c. Team name
 - d. Competition division
 - e. Deliverable name as 'Preliminary Report – October 2022'

2. Team Summary (up to 2 pages)

- a. Team name
- b. Institution(s) name
- c. Division
- d. Team members: Name, qualification, and their roles
- e. Approach: Description of how you plan to organise the team for working on SDI and the process you intend to follow moving forward in the competition
- f. Background of the lead institution, mention degree programmes and coursework relevant to the 10 contests of the Challenge (about 50 words)
- g. Faculty Lead and Faculty Advisors – Name, designation, relevant bio (not more than 25 words each)
- h. Names of Industry Partners (if any)

3. Project Summary (up to 2 pages)

- a. Project name: This can be something you have come up with, or something from your Project Partner.
- b. Project partner: Name of organization, background (50-100 words), name and designation of key individuals involved.
- c. Brief description of project (including but not limited to location, climate zone, status of the project, profile of occupants, hours of operation).
- d. Site area (m^2), permissible built-up area (m^2), permissible ground coverage, and proposed (estimated) built-up area (m^2).
- e. Your goal for Energy Performance Index (EPI) in kWh/m^2 per year for your Net-Zero-energy design.
- f. Preliminary estimate of on-site renewable energy generation potential, mentioning the amount from each renewable energy source (kWh per year).
- g. Preliminary construction budget (INR/m^2) and timeline (if any) in the format provided in Appendix A.
- h. Special requirements of the Project Partner, their goals for the project or constraints (if any).

4. Summary of Case Studies (up to 2 pages): Learnings from case studies you think are relevant to your project.**5. Context analysis (up to 1 page)**

- a. Analysis of the context your project sits in. Here you can include social and economic background of the users and the people in the region, identify technologies or materials that are regionally available, and regional environmental issues.
- b. Analysis of the market. Here you can include your assessment of segment of the population that your solution needs to cater to.

6. **Goals (up to 1 page):** Your team's goals for the project, including but not limited to the 10 contests. Refer to Appendix C for guidance on how to write goals for your project.
7. **Building area programme - (up to 1 page)**
 - a. Summary of site area, landscape area, total built-up area, etc.
 - b. Provide a list of spaces with their areas in m². Classify each space as *unconditioned* (i.e., will have no active heating or cooling systems), or *conditioned* (i.e., will have an active heating or cooling system).
8. **Findings from pre-design analysis (up to 4 pages):** A list of your findings from your pre-design analysis, supported by figures or tables. Present your observations and what you intend to carry forward in design.
 - a. Climate analysis
 - b. Site analysis
 - c. Preliminary energy and thermal analysis using simple box models
9. **Appendix:** Letter of Confirmation from Project Partner, using the template provided to you in the LMS.

Feedback Criteria

The organisers provide feedback on the following:

- Team composition
- Compliance with Division, and your building program, EPI goal, renewable energy estimate
- Findings from case studies
- Context analysis
- Goals for the project
- Preliminary analysis

Details for Deliverable 2

This section contains the requirements for **Deliverable 2** (i.e., the **Predesign Analysis and Concept Report and Project Data Form**) for SDI 2022-23 challenge. Teams must strictly follow the instructions listed in Table 2, below.

Table 2: Solar Decathlon India Deliverable 2 - File Naming Conventions and Deadlines

Deliverable	Required Content	File Name	Deadline
Predesign Analysis and Concept Report	Single Bookmarked PDF	D2_[DivisionLetterCode]_(TeamName).pdf e.g.: D2_MFY_TeamName.pdf D2_SFY_TeamName.pdf D2_EDU_TeamName.pdf D2_OFF_TeamName.pdf D2_CRS_TeamName.pdf D2_CWH_TeamName.pdf	21 - 28 November 2022, 5 pm IST
Project Data Form - 2	Form (accessible through the LMS)	D2_[DivisionLetterCode]_(TeamName)_ProjectData2	21 - 28 November 2022, 5 pm IST

Note: MFY = Multi-family housing; SFY = Single-family housing; EDU = Educational building; OFF = Office building; CRS = Community Resilience Shelter; CWH = On-site construction worker housing

Predesign Analysis and Concept Report

This is an interim submission to demonstrate the team's progress towards completing the project. Teams must adhere to the page count and content outline provided below.

Page count and file size

1. Maximum page count: Strictly **22 pages**, excluding the cover page, response to reviewers' comments and appendix. Submissions exceeding 22 pages may not be reviewed for feedback.
2. File size: Less than **30 MB**.

Content Outline

Please follow this outline in terms of the content, order, and number of pages allowed.

1. **Cover Page**, which must have the following content at least:
 - a. Logo of Solar Decathlon India
 - b. Name of your Institution(s)
 - c. Team name
 - d. Competition division
 - e. Deliverable name as 'Predesign Analysis and Concept Report – November 2022'.

2. **Table of Contents**
3. **List of Tables**
4. **List of Figures**
5. **Response to reviewers' comments**

- a. Provide reviewers' comments to your Deliverable 1 and your response to each comment mentioning any actions you have taken.

Note: Teams that do not submit the response to reviewers' comments will not get review comments for ANY subsequent deliverables. Refer to the template and example for "Response to reviewers' comments" inside the 'Survival Kit' in 'Resources and Forums' on the LMS.

6. **Team Summary (up to 2 pages, revised from Deliverable 1 as needed)**

- a. Team name
- b. Institution(s) name
- c. Division
- d. Team members: Name, qualification, and role
- e. Approach: Description of how you plan to organise the team for working on SDI and the process you intend to follow moving forward in the competition.
- f. Background of the lead institution, mention degree programmes and coursework relevant to the 10 contests of the Challenge (about 50 words)
- g. Faculty Lead and Faculty Advisors – Name, designation, relevant bio (not more than 25 words each)
- h. Names of Industry Partners (if any)

7. **Project Summary (up to 2 pages, revised from Deliverable 1 as needed)**

- a. Project name
- b. Project partner: Name of organization, background (50-100 words), name and designation of key individuals involved.
- c. Brief description of project (including but not limited to location, climate zone, stage of the project, profile of occupants, hours of operation)
- d. Estimated total built-up area (m²)
- e. Energy Performance Index (EPI) Goal in kWh/m² per year for your Net-Zero-energy design.
- f. Preliminary estimate of on-site renewable energy generation potential, mentioning the amount from each renewable energy source (kWh/year)
- g. Preliminary construction budget (INR/m²) and timeline (if any) in the format provided in Appendix A (Revised from D1 as needed)
- h. Special requirements of the Project Partner (if any)

8. **Context analysis (up to 1 page, revised from Deliverable 1)**

- a. Analysis of the context your project sits in. Here you can include social and economic background of the users and the people in the region, identify technologies or materials that are regionally available, and regional environmental issues.

- b. Analysis of the market. Here you can include your assessment of segment of the population that your solution needs to cater to.
9. **Goals – (up to 3 pages, revised and expanded from Deliverable 1)**
- a. Your team’s goals for the project, including but not limited to the 10 contests.
 - b. Your strategies for addressing each goal you have identified.

Note: Refer to Appendix C for guidance on how to write goals and strategies for your project.

10. **Building area programme - (up to 2 pages, revised and expanded from Deliverable 1)**
- a. Summary of site area, landscape area, total built-up area, etc.
 - b. Provide a list of spaces with their areas in m². Classify each space as *unconditioned* (i.e., will have no active heating or cooling systems, also termed as free running), or *conditioned* (i.e., will have an active heating or cooling system).
11. **Findings from pre-design analysis - (up to 2 pages, revised from Deliverable 1 as needed):** A list of your findings from your pre-design analysis, supported by figures or tables.
- a. Climate analysis
 - b. Site analysis
 - c. Preliminary energy and thermal analysis of simple box models
12. **Resilience (up to 1 page):** List and describe potential risks resulting from climate change, public health hazards and other disasters for the project and community. Identify and explain the stress and disruptions to services such as energy, water, food security, and waste disposal.
13. **Energy and Water consumption- (up to 2 pages)**
- a. Energy and Water consumption baseline estimates of all end-uses.
 - b. Preliminary water cycle diagram identifying uses and sources of water along with reuse pathways.
 - c. Preliminary analysis identifying strategies and approaches for energy demand reduction
14. **Design ideas with Pros & Cons (up to 7 pages):** Include ideas and design concepts that show approaches for architecture, structure, passive/active cooling/heating, building materials and provide preliminary energy and thermal comfort analysis of those design ideas. Provide a summary of ‘Pros & Cons’ that compare those design ideas and identify the direction you are likely to take moving forward.
15. **Appendix:** Letter of Confirmation from Project Partner (revised from Deliverable 1 if needed)

Feedback Criteria

The organisers provide feedback on the following:

- Your responses to Deliverable 1 comments
- Building area programme and classification of spaces for conditioning
- Resilience risk analysis
- Energy and water calculations
- Design ideas and their Pros & Cons

Details for Deliverable 3

This section contains requirements and details for **Deliverable 3** (i.e., **Intermediate Design Development Report, Pre-recorded Presentation, Project Data Form, and Cost Estimation Sheet**). This is an **elimination round**. The organizers will shortlist the finalists using the Judging Criteria. Teams must strictly follow the instructions listed in Table 3, below.

Table 3: Solar Decathlon India Deliverable 3 - File Naming Conventions and Deadlines

Deliverable	Required Content	File Name and size	Deadline
Intermediate Report	One Single PDF file: 1. Intermediate design development report (including Appendix)	Intermediate design development report (less than 30 MB): D3_[DivisionLetterCode]_(TeamName).pdf E.g.: D3_MFY_TeamName.pdf D3_SFY_TeamName.pdf D3_EDU_TeamName.pdf D3_OFF_TeamName.pdf D3_CRS_TeamName.pdf D3_CWH_TeamName.pdf	16 - 23 February 2023, 5 pm IST
Intermediate Presentation	One pre-recorded presentation	Pre-recorded presentation (up to 100 MB): D3_[DivisionLetterCode]_(TeamName)_Presentation.mp4	16 - 23 February 2023, 5 pm IST
Project Data Form - 3	Form (accessible through the LMS)	D3_[DivisionLetterCode]_(TeamName)_ProjectData3.pdf	16 - 23 February 2023, 5 pm IST
Cost Estimate	MS Excel Workbook in the template provided on the LMS	D3_[DivisionLetterCode]_(TeamName)_CostEstimate.xlsx	16 - 23 February 2023, 5 pm IST

Note: MFY = Multi-family Housing; SFY = Single-family Housing; EDU = Institutional building; OFF = Office building; CRS = Community Resilience Centre; CWH = On-site construction worker housing

Intermediate Report

This is an interim submission to demonstrate the team's progress towards completing the project. This includes the main report, appendix, and letters of confirmation, submitted as one single PDF document. Team must adhere to the page limit and content outline provided below. Submissions exceeding the page limit may be disqualified.

Page count and file size

1. Maximum page count: Strictly **31 pages**, excluding the cover page, response to reviewers' comments, tables of content, list of figures and tables, and appendix.

Content Outline

Please follow this outline in terms of the content, order, and number of pages allowed.

1. **Cover Page**, which must have the following content at least:
 - a. Logo of Solar Decathlon India
 - b. Name of your Institution(s)
 - c. Team name
 - d. Competition division
 - e. Deliverable name as 'Intermediate Design Development Report – February 2023'
2. **Table of Contents**
3. **List of Tables**
4. **List of Figures**
5. **Response to reviewers' comments**
 - a. Provide reviewers' comments to your Deliverable 2 and your response to each comment mentioning any actions you have taken.

Note: Teams that do not submit the response to reviewers' comments will not get review comments for ANY subsequent deliverables. Refer to the template and example for "Response to reviewers' comments" inside the 'Survival Kit' in 'Resources and Forums' on the LMS.

6. **Executive Summary (Strictly 1 page)**
 - a. The executive summary should contain the highlights of what you would like the jury to know about your team, your process, your project, and your design solution, or your achievements.
Note: The executive summary should not be just an introduction. It should provide an overview of your work, highlight important points and your next steps towards completing the challenge. This should also state the value proposition for your project partner and must include summaries of the project context and the problems you addressed, highlights of the design strategies, innovations, and the results you were able to achieve including, but not limited to energy performance, water performance, and cost effectiveness.
7. **Team Introduction (3 pages)**
 - a. The team summary should include, team name, institution(s) name, division, team members, your team organisation, background of the lead institution mentioning relevant degree programs, and coursework, faculty lead and advisors, Industry Partners and their role in your work

- b. Design management process, including but not limited to design charrettes, team meetings, analysis, reviews, industry partner inclusion, project partner discussion, and tools used.

Note: You can also add your team photo

8. Project Introduction (3 pages)

- a. Project Name
- b. Project Partner: Name of organization, background (50-100 words – capturing the nature of organization: Commercial Developer or Non-Profit Entity or Government body etc.), name and designation of key individuals involved
- c. Brief description of project site and context (clearly stating the purpose: Build-own-operate, build-sell, build-own-lease/operate; location; climate zone; stage of project; profile of occupants; hours of operation)
- d. Total built-up area (m²)
- e. Special requirements of the Project Partner, including any specific constraints (financial or otherwise), specific target (CAPEX limit or revenue or sale price expectations or zero/minimal OPEX) and involvement of the Project Partner post competition of construction (Sell, Lease, Self-occupation)

9. Goals and Strategies – (2 pages, revised from Deliverable 2)

- a. Your team's goals for the project, including but not limited to the 10 contests.
- b. Your strategies for addressing each goal you have identified.

Note: Refer to Appendix C for guidance on how to write goals and strategies for your project.

10. Design Process (2-pages)

- a. These two pages give you an opportunity to explain to the jury how you arrived at your design solution towards integrating the ten contests.

11. Design documentation (up to 20 pages)

- a. Demonstrate your performance on the ten contests. Refer to Section 4 **“Ten Contests and their Evaluation Criteria”**
- b. Use this section to document your design and its performance for each of the 10 contests including evidence to show that your work meets the requirements of each contest applicable to Deliverable 3.

Note: Follow the order of the ten contests in Section 4.

- c. Include drawings, narratives, and any additional evidence, etc. (as needed) to convey the above in the Appendix. Reference specific parts of the appendix in the main body of your report.

12. References, if any

Appendix (up to 30 pages, excluding letters of confirmation)

Provide at minimum

1. Detailed building area program - (up to 1 page, revised and expanded based on review and comments received in Deliverable 2)
2. Architectural drawings
3. Engineering drawings
4. Outline specifications of relevant building systems limited to two pages.
5. Energy simulation inputs. *Refer to the template and example for "List of input and output parameters" inside the 'Survival Kit' in 'Resources and Forums' on the LMS.*
6. Net-zero water-cycle design and calculations
7. Summary of Cost Estimate (Revised from D2 as needed). *Add the 'Project Summary' worksheet from the 'Cost Estimation' template inside the 'Survival Kit' in 'Resources and Forums' on the LMS*
8. Summary of Embodied Carbon calculations. *Add the 'Summary' worksheet from the 'Embodied Carbon' calculation tool inside the 'Survival Kit' in 'Resources and Forums' on the LMS.*

Letters of Confirmation (as many pages as needed)

1. Letter of Confirmation from Project Partner
2. Letter of Confirmation from Industry Partner(s)
3. Letter from your educational institution listing team members as bonafide students. In case a team is composed of students from multiple institutions, provide letters from each institution.

Intermediate Presentation

1. Submit a 5-minutes long pre-recorded presentation as part of Deliverable 3. The presentation should be addressed to your project partner and should summarise the highlights and the value proposition of your project. Presenter's audio must be clear. Teams must follow the format requirements below.
2. File type: '.mp4' (ensure the slides are in the aspect ratio of 16:9; resolution 1080p)
3. Formatting: Use **sans serif** font families (such as Helvetica, Verdana, Tahoma) for body text with a minimum of 16-point font size. (Diagrams may have smaller fonts but must be readable).
4. File size: Up to **100 MB**
5. Maximum length: **5 minutes**
6. Resolution and aspect ratio: **1920 X 1080**
7. Headers and footer: Header may have logo of your team and Solar Decathlon India. Footer must have the slide number and your team's name.

Feedback Criteria

The organisers shall review the reports as per the 'Judging Criteria'. Teams are expected to read the 'Ten Contests and their Requirements' section of this document carefully and meet the relevant requirements for the ten contests. The deliverable will be reviewed for:

- Compliance with the competition division and competition rules
- Requirements for each contest for Deliverable 3

Details for Deliverable 4

This section contains the requirements for **Deliverable 4** (i.e., the **Final Design Report, Movie, Design Challenge Presentations, Poster**) for Solar Decathlon India 2022-23 challenge. Only Finalist teams from the elimination round (based on Deliverable 3) are qualified to submit this report. Teams must strictly follow the instructions listed in Table 4, below.

Table 4: Solar Decathlon India Deliverable 4 - File Naming Conventions and Deadlines

Deliverable	Required Content	File Name and size	Deadline
Final Design Report	One single Bookmarked PDF i.e., Final design report (including Appendix)	Final Design report (Less than 30 MB): D4_[DivisionLetterCode]_(TeamName).pdf e.g.: D4_MFY_TeamName.pdf D4_SFY_TeamName.pdf D4_EDU_TeamName.pdf D4_OFF_TeamName.pdf D4_CRS_TeamName.pdf D4_CWH_TeamName.pdf	10 - 17 April 2023, 5 pm IST
Project Data Form - 4	Form (accessible through the LMS)	D4_[DivisionLetterCode]_(TeamName)_ProjectData4	10 - 17 April 2023, 5 pm IST
Cost Estimation Sheet	MS Excel Workbook in the template provided on the LMS	D4_[DivisionLetterCode]_(TeamName)_CostEstimate.xlsx	10 - 17 April 2023, 5 pm IST
Movie	3-minute or less - short movie	Movie (3-minutes or less) MOVDC_[DivisionLetterCode]_(TeamName).mp4 e.g.: MOVDC_MFY_TeamName.mp4 MOVDC_SFY_TeamName.mp4 MOVDC_EDU_TeamName.mp4 MOVDC_OFF_TeamName.mp4 MOVDC_CRS_TeamName.mp4 MOVDC_CWH_TeamName.mp4	24 April – 1 May 2023, 5pm IST
Division Jury presentation	Single MS Powerpoint file	Presentation (up to 200MB) PRESDJ_[DivisionLetterCode]_(TeamName).pptx e.g.: PRESDJ_MFY_TeamName.pptx PRESDJ_SFY_TeamName.pptx PRESDJ_EDU_TeamName.pptx PRESDJ_OFF_TeamName.pptx PRESDJ_CRS_TeamName.pptx PRESDJ_CWH_TeamName.pptx	3 - 10 May 2023, 5pm IST

Grand Jury presentation	Single MS <i>Powerpoint file</i>	Presentation (up to 200MB) PRESGJ_[DivisionLetterCode]_(TeamName).pptx e.g.: PRESGJ_MFY_TeamName.pptx PRESGJ_SFY_TeamName.pptx PRESGJ_EDU_TeamName.pptx PRESGJ_OFF_TeamName.pptx PRESGJ_CRS_TeamName.pptx PRESGJ_CWH_TeamName.pptx	3 - 10 May 2023, 5pm IST
Poster	One A0 sheet in landscape or two A1 sheets in portrait (soft copy and printed hard copy)	Poster (PDF file less than 20MB) POSTER_[DivisionLetterCode]_(TeamName).pdf e.g.: POSTER_MFY_TeamName.pdf POSTER_SFY_TeamName.pdf POSTER_EDU_TeamName.pdf POSTER_OFF_TeamName.pdf POSTER_CRS_TeamName.pdf POSTER_CWH_TeamName.pdf	3 - 10 May 2023, 5pm IST

Note: MFY = Multi-family Housing; SFY = Single-family Housing; EDU = Institutional building; OFF = Office building; CRS = Community Resilience Centre; CWH = On-site construction worker housing

Final Design Report

This section contains the requirements the **Final Design Report** for Solar Decathlon India 2022-23. This includes the main report, appendix, and Letters of Confirmation, submitted as one single PDF document. Teams must adhere to the page limit and content outline provided below. The panel of jury will judge and evaluate the finalists team based on the 'Judging Criteria'.

Page count and file size

1. Maximum page count: Strictly **36 pages**, excluding the cover page, response to reviewers' comments tables of content, list of figures and tables, appendix.

Content Outline

Strictly follow this outline in terms of the content, order, and number of pages allowed. Sections must be numbered according to the outline below.

1. **Cover page**, must have the following content at a minimum
 - Logo of Solar Decathlon India
 - Name of your Institution(s) and (logos optional)
 - Team Name and (logo optional)
 - Competition Division
 - Name of Project Partner and (logo optional)
 - Deliverable name as "Final Design Report – April 2023"
2. **Table of Contents**
3. **List of Tables**

4. List of Figures

5. Executive Summary (Strictly 1 page)

- a. The executive summary should contain the highlights of what you would like the jury to know about your team, your process, your project, and your design solution, or your achievements, *briefly*.

Note: The executive summary should not be just an introduction. It should provide an overview of your work, highlight important points. This should also state the value proposition for your project partner and must include summaries of the project context and the problems you addressed, highlights of the design strategies, innovations, and the results you were able to achieve including, but not limited to energy performance, water performance, and cost effectiveness.

6. Response to reviewers' comments

- a. Provide a summary list of the reviewer's comments to your Deliverable 3, and your responses including actions you have taken.

Note: Teams that do not submit the response to reviewer comments will not get review comments.

7. Team Introduction (2 pages)

- a. The team summary should include, team name, institution(s) name, division, team members, your team organisation, background of the lead institution mentioning relevant degree programs, and coursework, faculty lead and advisors, Industry Partners and their role in your work
- b. Design management process, including but not limited to design charrettes, team meetings, analysis, reviews, industry partner inclusion, project partner discussion, and tools used.

8. Project Background (2 pages) – revised from Deliverable 3 as needed

- a. Project Name
- b. Project Partner: Name of organization, background (50-100 words – capturing the nature of organization: Commercial developer or non-profit entity or government body etc.), name and designation of key individuals involved
- c. Brief description of project site and context (clearly stating the purpose: Build-own-operate, build-sell, build-own-lease/operate; location; climate zone; stage of project; profile of occupants; hours of operation)
- d. Total built-up area (m²)
- e. Special requirements of the Project Partner, including any specific constraints (financial or otherwise), specific target (CAPEX limit or revenue or sale price expectations or zero/minimal OPEX) and involvement of the Project Partner post competition of construction (Sell, Lease, Self-occupation)

9. Goals – (1 page)

- a. Goals of the project, including but not limited to the ten contests. Also note what your solution achieves with respect to each goal.

10. Design documentation - (up to 30 pages)

- a. Demonstrate your performance on the 10 contests. Refer to Section 4 “Ten Contests and their Requirements” in the Solar Decathlon India 2022-23 Competition guide. *Remember, each Contest carries the same weight for scoring.*
- b. Use this section to document your design and its performance for each of the 10 contests including evidence to show that your design meets all the requirements for each contest
- c. Include drawings, write-ups, and any additional evidence, etc. (as needed) to convey the above. Reference specific parts of the appendix in the main body of your report.

Note: Follow the same order of the ten contests to report this section, as mentioned in the competition guide.

11. References, if any

Appendix (up to 50 pages)

Provide at minimum:

1. Detailed building area program - (up to 1 page)
2. Architectural drawings
3. Engineering drawings
4. Outline specifications of relevant building systems limited to two pages.
5. Energy simulation inputs. *Refer to the template and example for “List of inputs and outputs parameter” inside the ‘Survival Kit’ in ‘Resources and Forums’ on the LMS.*
6. Net-zero water-cycle design and calculations
7. Summary of Cost Estimate (Revised from D2 as needed). *Add the ‘Project Summary’ worksheet’ from the ‘Cost Estimation’ template inside the ‘Survival Kit’ in ‘Resources and Forums’ on the LMS*
8. Summary of Embodied Carbon calculations. *Add the ‘Summary’ worksheet from the ‘Embodied Carbon’ calculation tool inside the ‘Survival Kit’ in ‘Resources and Forums’ on the LMS.*
9. Building operation narrative that lists the Do’s and Don’ts for proposed building systems. *Refer to the guidance document on this inside the ‘Survival Kit’ in ‘Resources and Forums’ on the LMS*
10. List of key parameters to measure the performance of the building. *Refer to the guidance document on this inside the ‘Survival Kit’ in ‘Resources and Forums’ on the LMS.*

Letters of Confirmation (as many pages as needed)

1. Letter of Confirmation from Project Partner

2. Letter of Confirmation from Industry Partner/s

Movie

Teams should submit a 3-minutes long movie (*click [here](#) to see examples*). The movie should tell an inspiring story of your work to convey the problem, your solution, who the solution serves, and how.

All content in the movie, including graphics, images, must be original and should not include any copyrighted material. (*Note: Movie is different from a recorded presentation*)

By submitting the video, the team grants the SDI organisers the right to edit the video in alignment with SDI branding and post to SDI [YouTube channel](#), including amplification through social media and other channels.

Teams must follow the format requirements and submit the movie before the deadline i.e., **5 pm IST, 1 May 2022**.

Here are the items required for your movie submission:

- Thumbnail for YouTube: 1280 X 720 pixels (png, jpeg, or gif)
- Title of the movie: 100 characters including spaces
- Description of the movie: 5,000 characters including spaces
- Movie: Format as described below.

Format requirements

1. Length: up to 3 minutes
2. File type: '.mp4'
3. File size: up to 400 MB
4. Resolution and aspect ratio: 1920 X 1080

Division Jury Presentation

Each team prepare and submit one presentation for the Design Challenge Finals event. Teams will deliver a 25-minute presentation with additional time for questions and answers. Teams must follow the format requirements and submit the presentation before the deadline i.e., **5 pm IST, 10 May 2023**.

Grand Jury Presentation

Each team prepare and submit one presentation for the Design Challenge Finals event. Division winners will deliver the 5-minute pitch with additional time for questions and answers to the Grand Jury on 14 May 2023. Division Winners will be announced on the morning of May 13, 2023. Teams must follow the format requirements and submit the presentation before the deadline i.e., **5 pm IST, 10 May 2023**.

Formatting Requirements (for both Division Jury and Grand Jury Presentation)

1. File type: '.pptx' (Ensure the slides are in the aspect ratio of 16:9)

2. Formatting: Use **sans serif** font families (such as Helvetica, Verdana, Tahoma) for body text with a minimum of 16-point font size. (Diagrams may have smaller fonts but must be readable).
3. File size: Up to **200 MB**; and maximum slide count: No limit.
4. To ensure that all electronically submitted materials work with the organizers' presentation computers, teams should embed all videos in the team submission.
5. Headers and footer: Header may have logo of your team and Solar Decathlon India. Footer must have slide number and your team's name.

Poster

Teams should submit one poster of their work. The poster size should be one A0 sheet (in landscape) or two A1 sheets (in portrait). Teams will present their poster during the 'Poster Session' in the Design Challenge Finals event. Teams should carry print(s) of their poster to the Design Challenge Finals event. Teams must also submit a soft copy of their poster to SDI organisers before the deadline i.e., **5 pm IST, 10 May 2023**.

10. Appendix

A. Construction budget template

Note: Figures are for representation purpose only.

S.No.	Particulars	Definition	Baseline Estimate (Project Partner / SOR basis)		
			Amount (Million INR)	%	Amount (INR per sqm)
1	Land	Cost of land purchased or leased by the Project Partner	100.00	53.6%	125,000
2	Civil Works	Refer Item A, Civil works in Cost of construction worksheet	2.20	1.2%	2,750
3	Internal Works	Refer Item B, Civil works in Cost of construction worksheet	1.44	0.8%	1,800
4	MEP Services	Refer Item C, Civil works in Cost of construction worksheet	40.17	21.5%	50,215
5	Equipment & Furnishing	Refer Item D, Civil works in Cost of construction worksheet	0.01	0.0%	13
6	Landscape & Site Development	Refer Item E, Civil works in Cost of construction worksheet	0.20	0.1%	252
7	Contingency	Amount added to the total estimate for incidental and miscellaneous expenses.	2.20	1.2%	2,751
TOTAL HARD COST			146.2	78%	182,781
8	Pre Operative Expenses	Cost of Permits, Licenses, Market research, Advertising etc	10.00	5.4%	12,500
9	Consultants	Consultant fees on a typical Project	10.00	5.4%	12,500
10	Interest During Construction	Interest paid on loans related to the project during construction	20.25	10.9%	25,318
TOTAL SOFT COST			40.3	22%	50,318
TOTAL PROJECT COST			186.5	100%	233,099

B. Guidance to approach Project Partner

How should you approach the Project Partner?

- Carefully read the [Project Partner Guide](#) available on the SDI website.
- Prepare an introduction of your institute, your team, and of the SDI 2022-23 Challenge.
- Use your team's or your faculty's contacts to connect with a person at the potential Project Partner's organisation.
- Provide the introduction of your team and institution. Invite the Project Partner to collaborate with you. Explain the benefits to them. Explain what their commitment will be. Show them the names of Project Partners from the last year's challenge.
- Get a verbal agreement first. Follow up later for getting a letter from the Project Partner.

What information should you ask the Project Partner for?

Early-stage requests

- Necessity for any of the information to be kept confidential.
- What is the profile of the expected occupants? Businesses, consumers, socio-economic/ demographic profile of the Occupants /Buyers /Investors
- Will it be a Build-Own-Operate model, or a Build-Lease-Operate model, or a Build-Sell model, etc?
- What is the anticipated building programme and space requirements?
- What will be the building hours/ days of operation?
- Anticipated project budget

- Marketing/ branding strategy, if any (Pre- or Post-Construction)

Follow-up requests

- BOQs for similar projects done by the Project Partner
- Water/ sewage: Sources of water supply, availability of connectivity to Municipal Stormwater/ Sewage Trunk Infrastructure
- Power requirements: Sources of power (Cost of Electricity), dependence on DG Sets (essential or 50% or 100%), sources of fuel and costs (Gas/ Diesel)
- Construction Methodology: Preferred construction materials/ construction techniques/ preferred MEP and electrical equipment

Through the information collected from the Project Partner, teams should be able to define the following:

- Brief description of the project, and profile of potential occupants
- Site information: Geo-location, site plan with dimensions, and other site information
- Summary of zoning and regulation requirements: Applicable FSI / FAR, ground coverage, setbacks, building height, fire safety, and other applicable norms.
- Building Area Programme: Building Area Programme and spatial requirements
- Project construction timeline and budget
- Goals/ specific targets for the Project, if any (E.g., BEE/ LEED Compliant or Cost per unit area (INR/ft²) to be achieved or Cost Optimization/ Value Engineering Target compared to previous projects or eligibility criteria for Govt Subsidies)
- Ownership, rental, leasing, and operations approach.

C. Guidance document on 'Goals and Strategies'

Setting goals is a necessary step to designing performance-oriented buildings. This helps everyone on the team, including designers and building owners, agree on expectations. Once the goals are in place, it is possible to develop strategies to achieve them and test design ideas. Design concepts are usually strategies aimed at achieving the goals. This document is intended to help you formulate the goals and strategies for your net-zero project.

- Goals indicate *what* you want to achieve, while strategies/concepts indicate *how* you want to achieve your goals.
- A goal will typically be in the format: *Achieve this*. A strategy or a concept on the other hand, will be in the format: *Let's do this* (to achieve that goal).
- Goals are the ends. Strategies are the means.

Goals

Broadly there are 4 types of goals

1. **Lip-Service Goals:** These are attractive goals that look good in public relations publications, but often lack sufficient definition to be useful in the design process.

Example: *Our Net-Zero Energy building will be extremely cost-effective.*

2. **“Motherhood” Goals:**

These are goals that no one can argue against, and they usually sound impressive. However, they are too general and vague to be useful in the design process.

Example: *Our building will provide a good environment for its occupants.*

While the above goal sounds great, it is not very useful in the design process. What is “good for occupants” is not defined clearly. Will it reduce their stress levels? Will it provide them good air quality? Your goals need to be specific and precise.

3. **Inspirational Goals:** These are ambitious “Motherhood” goals.

Example: *Our design will be an exemplary Net-Zero Energy building that will act as a beacon for climate action.*

They too are vague to be useful in the design process.

4. **Practical Goals:** These goals contain a framework so one can gather relevant information to test if the goals have been achieved. They will include a benchmark or a quantifiable target to be achieved.

Examples:

- Our building will satisfy the thermal comfort needs of 80% of the occupants.
 - *Here, satisfying thermal comfort is the overarching goal. The 80% provides a defined threshold.*
- *Our design for the new school will consume 50% less energy than our previous building and will have a positive ROI for over 10 years.*
 - *Here, the goal has two parameters, which may not be aligned. Such an instance may need optimization.*
- *Our building design will become very popular among the public and will get news coverage in at least 4 magazine articles.*
 - *While “very popular” looks like a lip-service goal, it is tethered to performance with “at least 4 magazine articles”.*

Your goals need to be aspirational as well as practical. You can start your goal-setting process with “motherhood” goals, as they are unassailable. However, the next step is to restate the goals such that you can answer the question: *is the goal written in a way that you can demonstrate or prove to someone that you have achieved the goal?*

Strategies or Concepts

Strategies or concepts can be about your design approach or how you intend to design your building.

- Example: Use the most efficient building envelope to reduce the cooling loads. In this, reducing the cooling load is the objective of the strategy, while the efficient building envelope is the strategy.
- Example: Use precast components in the building to reduce construction time and improve construction quality. Here again, there is a strategy as well as an objective to the strategy. Including an objective to your strategy is helpful to give it focus.
- Example: Use energy simulations to right-size the HVAC systems. This strategy is about the design process, and not about the building.

Uncover and Test Strategies

Strategies can be classified into programmatic strategies and design strategies.

- 1) Programmatic strategies refer to abstract ideas intended as solutions to problems.
- 2) Design strategies refer to concrete ideas intended as physical solutions.
 - Example:
Programmatic strategy: *Provide flexibility*
Design strategy: *Provide a folding partition*
 - Example:
Programmatic strategy: *Protect pumps from flooding*
Design strategy: *Install all pumps 5m above the ground level.*

Goals and strategies

Here are few examples of goals and strategies that are weak and strong.

Goal

Weak: Provide a significant reduction in energy needed for cooling and lighting.

Strong: Reduce the energy needed for cooling and lighting by 50% from the business-as-usual case.

Stronger: Achieve an EPI of 50 kWh/m².year.

Strategy

Weak: Reduce heat gain and energy demand.

Strong: Reduce heat gain by minimizing window area and shading the windows. Reduce cooling energy demand with efficient cooling systems.

Goal

Weak: Super energy efficient building.

Strong: Achieve Net Zero Energy Building with an EPI of 50 kWh/m².year.

Strategy

Weak: Use rainwater

Strong: Use rainwater harvesting to offset the irrigation water use.

Goal

Weak: Provide a comfortable environment to inspire students to learn and boost their productivity as well.

Strong: Achieve thermal comfort according to India Model for Adaptive Comfort (IMAC) to boost learning and productivity of the students.

Strategy

Weak: Mixed mode operation of the building.

Strong: Use operable windows in the classrooms and offices along with radiant cooling for mixed mode operation of the building.

D. Guidance document on 'Innovation'

What is innovation?

- Innovation is the practical implementation of an invention, to make a meaningful impact. Innovation is not the same as invention³.
- The objectives for innovation are 'faster', 'cheaper', and 'better'. The focus is to make something available to people, businesses, or governments.
- Innovation should aim for improved processes, improved quality, reduced costs, reduced materials, or reduced environmental impact.

How to approach the innovation contest

- Teams should make an effort to understand the context of their project, interview stakeholders and identify problems to address.
- Look for innovative techniques, technologies and learn about ongoing research and development activities within or outside the buildings sector. Identify potential innovations that could address these problems.
- Assess the innovations for their *Technology Readiness Level*. Integrate the technology or technique in your proposed project solution.
- As you think about the opportunities for scaling up the innovation, try to answer the following questions: Is it easily repeatable or scalable? Are there resources available for speedy adoption in the market? What is the size of the market? Who are the likely first customers? Does it need a policy change or a business model?

Along with the innovation itself, these issues should be discussed with industry partners. This will help your team in identifying challenges for implementation and scaling up, and how these challenges can be addressed. If feasible, working models or prototypes should be tested.

³ An **invention** is a unique or novel device, method, composition or process.

Documentation Requirements

1. Names

- A name for your Innovation Idea / Start-Up / Company
- List partners involved, if any.

2. Idea

A short 2-3 sentence description, like an elevator pitch, of your business idea, product, or service

3. Problem

What problem are you solving, and who will benefit from it? Will the beneficiary be able to pay for it? If not, what is the likely source to pay for the product or service?

4. Technology or solution

Does your idea make use of advanced or new technology? If yes: explain how it works. What is the technology readiness level of your idea? How are you integrating it in your design. Is your idea a service or a business model? What elements of your project design support the service or the business model?

5. Market

What you have learned about the market? Which region or demographic will benefit from your idea? How big is this market? What is required for scaling-up the solution for this market?

6. Costs, benefits, and impacts

What are the cost implications to the potential customer? How does your idea addresses climate change and what positive impact will it bring to the world? What are some other benefits? Is there an ROI to be shown?

Use the checklists below to assess your progress and communicate this in your deliverables.

- Assess the *technology readiness level* of the technology you have identified using the checklist below. It is mandatory to assess and communicate this. **Check all boxes that apply.**
 - The technology is in basic research.
 - Applied research begun and practical application has been identified.
 - Preliminary testing done and feasibility established in a laboratory environment.
 - Preliminary testing done and feasibility established in a field environment.
- Assess the *innovation readiness in design* using the checklist below. **Check all boxes that apply.**
 - The product or service has been integrated in design for the intended application.
 - The cost estimates and ROI calculations have been done.
 - Partnerships have been developed with the relevant industry.
 - The proposed innovation has been reviewed by the partner/s and their feedback has been incorporated.
 - The proposed innovation has been endorsed by the partner/s.

- The product or service has been prototyped for the intended application.
- The prototype has been tested in the field for the intended application.
- Assess your progress on the *costs and benefits* using the checklist below. **Check all boxes that apply.**
 - The proposed innovation has potential to reduce greenhouse gas emissions.
 - The greenhouse gas emissions reductions have been quantified.
 - The other environmental impacts that can be reduced have been listed.
 - The other environmental impacts that can be reduced have been quantified.
 - Cost and benefits have been estimated to show an ROI.

11. Version Control

#	Date of Publishing	Version	Summary of changes
1	July 2022	1.0	<ul style="list-style-type: none"> • Not Applicable
2	September 2022	1.1	<ul style="list-style-type: none"> • Judging criteria and judging process added • Requirements for the Ten Contests added • Appendix D – Guidance document on Innovation added • Deliverable 3 and Deliverable 4 Outline added
3	January 2023	1.2	<ul style="list-style-type: none"> • Dates for Deliverable 4 revised • Revised Schedule <ul style="list-style-type: none"> ○ Faculty conference replaced by Faculty Feedback meeting ○ Tickets to Finals event added

12. Terms and Conditions

- a. Participants agree that they abide by the rules and conditions stated in the Solar Decathlon India Competition Guide, and any updates/revisions specified by the organisers from time to time.
- b. Solar Decathlon India logo shall only be used by the participants with the prior written permission in accordance with the Terms of Use provided on the website.
- c. Participants agree that personal data submitted by them may be collected, processed, stored, and otherwise used for the purposes of conducting and administering the competition. By entering the competition, participants agree to the transmission, processing, disclosing and storage of the personal data for the requirements of the competition related activities.
- d. Participants agree to participate in any media or promotional activity resulting from the competition as reasonably requested by the competition organisers at its expense. The project submissions may also be used for promotional, marketing, press and media purposes including on the competition website. Participants acknowledge that they are not paid for use of the same and hereby relinquish any monetary or other claims against Solar Decathlon India for this use.
- e. Subject to fair dealing requirements under Indian laws, wherein the competition organisers have the right to use the competition material and results for teaching, instruction, and research (including publication/putting up material in the public domain, further preparation of material etc.), the IP for the material produced by the teams shall vest with the respective teams. Such rights of the team may also be subject to any agreement as applicable entered into with their respective Project/Industry partners as long as fair dealing rights of the competition organisers as specified above are retained.
- f. Teams must cite sources for other referenced works. If the teams are using work done by the team members for any other competition, they must ensure that they have the complete ownership of the work (no disputes), and such work must not be submitted directly, and shall adhere to competition submission requirements.
- g. All work submitted shall be original and the teams must ensure that they have the complete ownership of the work (i.e., no disputes or any restrictive covenants from third parties prohibit such use).
- h. All work submitted shall adhere to competition submission requirements.
- i. If a team fails to submit a deliverable within the published deadline, it is deemed to have withdrawn from the Solar Decathlon India competition.
- j. All work of the teams must be original; no plagiarism is allowed. If the organisers find any plagiarism in a team's work, it may lead to disqualification of the team from the competition.
- k. The work submitted by the teams must not contain content, material or any element that is unlawful, or otherwise in violation of or contrary to all applicable national or state specific laws and regulations.
- l. The work submitted by the teams must not contain any content, material or element that displays any third-party advertising, slogan, logo, trademark or

otherwise indicates a sponsorship or endorsement by a third party, that is not within the spirit of the competition.

- m. Teams are responsible for the terms determined with their Industry Partner's policies, subject to fair dealing rights to the competition organisers as mentioned above.
- n. The final decision is of the Jury; no arguments or challenges on the same is allowed.
- o. Each team is financially responsible for any damage it causes during the competition events.
- p. Teams are liable to be disqualified for violating any of these terms.
- q. Participants from each team represent that they have carefully read and fully understood the terms and conditions of participating in Solar Decathlon India and hereby accept the same. They also acknowledge that in view of the current COVID-19 situation, the organisers reserve the right to amend relevant provisions governing the competition keeping in mind the interests of the participants and the competition organisers, in accordance with relevant government directives from time to time. The participants further acknowledge that all the information submitted by them is true and they have not misrepresented or falsified any information provided. In the event that any representation made, or documents duly submitted herein are untrue or materially inaccurate amounting to misrepresentation, the organisers shall at its discretion and without prejudice to any other right that may be available to the organisers, shall take suitable action in this regard, including cancellation of participation and other relevant action.
- r. The competition organisers reserve the right to withdraw or amend the competition and these Terms and Conditions in the event of any unforeseen circumstances, including situations arising out of COVID-19.



Organisers



Govt Support



Program Support



CSR Support



Affiliates



The roles and responsibilities of AEEE and IIHS are separate and distinct, with independent budgets, financial resources, and execution. ClimateWorks Foundation supports AEEE. IEEE SA (India) and ISHRAE (India) are outreach partners. DesignBuilder™ and Solemma LLC provides free software licenses to all student participants and faculty mentors. ClimateLaunchPad India incubates selected teams.



For more information, visit

SolarDecathlonIndia.in

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