



SOLAR DECATHLON INDIA

Competition Guide 2023-24

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1 Introduction

This is a guidance document for the participants of the Solar Decathlon India (SDI) 2023-24 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 Efficient 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. These were followed up with the India's updated Nationally Determined Contribution under the Paris Agreement for up to 2030. To achieve and accelerate these, 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 can choose to compete in any one of the Divisions in the 2023-24 challenge. The 2023-24 Challenge includes 5 Building Divisions, and 1 Product Division. The Building Divisions are challenges to design an entire building for a building owner or a developer who acts as a Project Partner. The Product Division is a challenge to design, develop, and test a working prototype as a product solution, with a product, material, or equipment manufacturer acting as an Industry Partner.

2.1 Tasks

- Read this Competition Guide and form a team.
- Register your team.
- Identify a Project Partner/ Industry Partner.
- Ensure that all team members complete all mandatory online learning modules.
- Study the resources listed in this guide.
- Identify additional partnerships for the areas of the competition that need collaboration.
- Consult the SDI [website](#) for updates and announcements.
- Design and document your work, in compliance with the requirements listed in this guide, and its subsequent updates.
- Submit all Deliverables before the deadlines.

2.2 Registration and Fees

Team Leads will register their teams on the portal which can be accessed through the website. The registration fee for the 2023-2024 Challenge is INR 6,000 (inclusive all taxes) per team, which is non-refundable.

3 Building Divisions

There are 5 Building Divisions in the 2023-24 challenge. Teams can choose to compete in any one of the following divisions in 2023-24 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.

3.1 Multi-Family Housing (MFY)

Multi-Family Housing is projected to experience exponential growth 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 by giving them 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 must provide active cooling* if passive cooling strategies are not adequate to maintain thermal comfort.
- e. If the Project Partner's programme requires additional community services, teams may limit their energy and water performance calculations to residential dwelling units only.
- f. Disability access should be provided.

3.2 Educational Building (EDU)

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 must provide active cooling* if passive cooling strategies are not adequate to maintain thermal comfort.
- e. Disability access should be provided.

3.3 Office Building (OFF)

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 footprint (built-up area): 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 must provide active cooling* if passive cooling strategies are not adequate to maintain thermal comfort.
- f. Disability access should be provided.

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.

3.4 Community Resilience Shelter (CRS)

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).
- g. 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.
- h. 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.
- i. 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.
- j. The shelter should be able to operate during a 'lockdown period' of 60 hours.

- k. The shelter should serve as a community usable space during non-disaster, extreme event times. This will require an assessment of community needs.
- l. 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.
- m. The design should maintain temperatures as per the thermal comfort standard in all the occupied areas during occupied hours. *You must provide active cooling* if passive cooling strategies are not adequate to maintain thermal comfort.
- n. Disability access should be provided at least for the ground/ lowest floor.

3.5 Construction Worker Housing (CWH)

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 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 following 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 5m² 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 must provide active cooling* if passive cooling strategies are not adequate to maintain thermal comfort.

3.6 Forming a Team

3.6.1 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.

3.6.2 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.

3.6.3 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.

3.6.4 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.

3.7 Ten Contests and Their Requirements for the Building Divisions

The ten contests of the Building Divisions cover diverse areas that embody the expectations of high performance, market-ready, climate resilient, and net-zero building projects. 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 Section 3.8 for the detailed outline for each Deliverable.

3.7.1 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 narratives 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.

3.7.2 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 minimise 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:

- ***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.

3.7.3 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 of the Documentation Requirements (*Names; Idea; Problem; Technology or solution; Market; Costs, benefits, impacts*).¹
- **Integration of innovation**, demonstrated in the proposed design.

3.7.4 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 must 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 (air-conditioned, naturally ventilated, or mixed mode).
- **Strategies for reducing thermal stress in the outdoor environment** and minimising thermal shock in transitional spaces.

For ventilation and air quality

¹ Teams should refer to the Documentation Requirements for Innovation under the Survival Kit on the LMS.

- ***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.

3.7.5 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.

3.7.6 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 customisation 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

- ***Minimising 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.

3.7.7 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, and 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.

3.7.8 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 minimise 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 metrics² 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.

3.7.9 Affordability

This contest evaluates the building's financial costs for initial investment and ongoing operations. Teams are required to demonstrate rightsizing and optimisation 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 contest 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.

3.7.10 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

² Teams should refer to the 'Resilient Design' SLM for explanation of the resilience metrics.

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.

3.8 Deliverables for the Building Divisions

This section provides detailed requirements of the Deliverables for the Building Division in the 2023-24 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.

3.8.1 Details for Deliverable 1

This section contains the requirements for Deliverable 1 (i.e., the Preliminary Report and Project Data Form) for the Building Division. Teams must strictly follow the instructions listed in Table 1, below.

Table 1: Solar Decathlon India Deliverable 1 for Building Division - 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_EDU_TeamName.pdf D1_OFF_TeamName.pdf D1_CRS_TeamName.pdf D1_CWH_TeamName.pdf	3 - 10 October 2023, 5 pm IST
Project Data Form - 1	Form (accessible through the LMS)	D1_[DivisionLetterCode]_(TeamName)_ProjectData1	3 - 10 October 2023, 5 pm IST

Note: MFY = Multi-Family Housing; EDU = Educational Building; OFF = Office Building; CRS = Community Resilience Shelter; CWH = Construction Worker Housing

3.8.1.1 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: **Strictly 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 2023'.

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 organisation, 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 (m²), permissible built-up area (m²), permissible ground coverage, and proposed (estimated) built-up area (m²).
- e. Your goal for Energy Performance Index (EPI) 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 per year).
- g. Preliminary construction budget (INR/m²) and timeline (if any) in the format provided *inside the 'Survival Kit' on the LMS*
- 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 guidance on how to write goals for your project inside the 'Survival Kit' on the LMS.*

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 the requirements of the Division, and your building program, EPI goal, renewable energy estimate
- Findings from case studies
- Context analysis
- Goals for the project
- Preliminary analysis
- Correctness of calculations

3.8.2 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 the Building Division. Teams must strictly follow the instructions listed in Table 2, below.

Table 2: Solar Decathlon India Deliverable 2 for Building Division - 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_EDU_TeamName.pdf D2_OFF_TeamName.pdf D2_CRS_TeamName.pdf D2_CWH_TeamName.pdf	21 - 28 November 2023, 5 pm IST
Project Data Form - 2	Form (accessible through the LMS)	D2_[DivisionLetterCode]_(TeamName)_ProjectData2	21 - 28 November 2023, 5 pm IST

Note: MFY = Multi-Family Housing; EDU = Educational Building; OFF = Office Building; CRS = Community Resilience Shelter; CWH = Construction Worker Housing

3.8.2.1 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 2023'.
2. **Table of Contents**
3. **List of Tables**
4. **List of Figures**
5. **Response to reviewers' comments³**
 - 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.

³ Teams should refer to "Template for responding to the reviewers' comments" under the Survival Kit on the LMS.

- b. Project partner: Name of organisation, 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 inside the 'Survival Kit' in 'Resources and Forums' on the LMS. (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 the guidance on how to write goals and strategies for your project inside the 'Survival Kit' in 'Resources and Forums' on the LMS.

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 and 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 and 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 and Cons

3.8.3 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 organisers 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 for Building Division - File Naming Conventions and Deadlines

Deliverable	Required Content	File Name	Deadline
Intermediate Report	Single Bookmarked PDF (less than 30 MB, including Appendix)	D3_[DivisionLetterCode]_(TeamName).pdf e.g., D3_MFY_TeamName.pdf D3_EDU_TeamName.pdf D3_OFF_TeamName.pdf D3_CRS_TeamName.pdf D3_CWH_TeamName.pdf	20 - 27 February 2024, 5 pm IST

Intermediate Presentation	One pre-recorded presentation (up to 100 MB)	D3_[DivisionLetterCode]_TeamName_Presentation.mp4	20 - 27 February 2024, 5 pm IST
Project Data Form - 3	Form (accessible through the LMS)	D3_[DivisionLetterCode]_(TeamName)_ProjectData3	20 - 27 February 2024, 5 pm IST
Cost Estimate	MS Excel workbook (in the template provided on LMS)	D3_[DivisionLetterCode]_(TeamName)_CostEstimate.xlsx	20 - 27 February 2024, 5 pm IST

Note: MFY = Multi-Family Housing; EDU = Educational Building; OFF = Office Building; CRS = Community Resilience Shelter; CWH = Construction Worker Housing

3.8.3.1 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.

Maximum page count: Strictly **24 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 Report – February 2024'
- 2. Table of Contents**
- 3. List of Tables**
- 4. List of figures**

- 5. Response to reviewers' comments⁴:** 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' on the LMS.

- 6. Executive Summary (Strictly 1 page):** 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. Introduction (3 pages)

- a. Project Name
- b. Who: Team name; list of team members and their roles; institution(s) name and background; project partner(s) name, background and name and designation of key individuals involved; industry partner(s) role, name, background and name and designation of key individuals involved; occupant profile; and other stakeholders important to your project
- c. Why: The need for the project; brief description of context with site, location, and climate; the purpose (Build-own-operate, build-sell, build-own-lease/operate)
- d. What: Brief description of your solution, your project goals, total built-up area (m²), 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), hours of operation
- e. How: Description of your design process.

8. Design documentation (up to 20 pages)

- a. Demonstrate your performance on the ten contests. Refer to Section 3.7 '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 as laid down in Section 3.7*)

⁴ Teams should refer to "Template for responding to the reviewers' comments" under the Survival Kit on the LMS.

- 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.

9. References, if any

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

Provide at minimum:

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

Letters of Confirmation (as many pages as needed)

- a. Letter of Confirmation from Project Partner
- b. Letter of Confirmation from Industry Partner(s)
- c. 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.

3.8.3.2 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

3.8.4 Details of Deliverable 4

This section contains the requirements for **Deliverable 4 (i.e., the Final Design Report, Movie, Design Challenge Presentations, Poster)** for SDI 2023-24 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 for Building Division - File Naming Conventions and Deadlines

Deliverable	Required Content	File Name	Deadline
Final Design Report	Single Bookmarked PDF (less than 30 MB, including Appendix)	D4_[DivisionLetterCode]_(TeamName).pdf e.g., D4_MFY_TeamName.pdf D4_EDU_TeamName.pdf D4_OFF_TeamName.pdf D4_CRS_TeamName.pdf D4_CWH_TeamName.pdf	11 - 18 April 2024, 5 pm IST
Project Data Form - 4	Form (accessible through the LMS)	D4_[DivisionLetterCode]_(TeamName)_ProjectData4	11 - 18 April 2024, 5 pm IST
Cost Estimate	MS Excel workbook (in the template provided on LMS)	D4_[DivisionLetterCode]_(TeamName)_CostEstimate.xlsx	11 - 18 April 2024, 5 pm IST
Movie	3-minute or less, short movie	MOVDC_[DivisionLetterCode]_(TeamName).mp4	1 - 6 May 2024, 5 pm IST
Division Jury presentation	Single MS PowerPoint file (Up to 200 MB)	PRESDJ_[DivisionLetterCode]_(TeamName).pptx	6 - 13 May 2024, 5 pm IST
Grand Jury presentation	Single MS PowerPoint file (Up to 200 MB)	PRESGJ_[DivisionLetterCode]_(TeamName).pptx	6 - 13 May 2024, 5 pm IST

Images	5-high resolution images that represent your work (each less than 10 MB)	IMAGE1_[DivisionLetterCode]_ (TeamName) IMAGE2_[DivisionLetterCode]_ (TeamName) IMAGE3_[DivisionLetterCode]_ (TeamName) IMAGE4_[DivisionLetterCode]_ (TeamName) IMAGE5_[DivisionLetterCode]_ (TeamName)	6 - 13 May 2024, 5 pm IST
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Note: MFY = Multi-Family Housing; EDU = Educational Building; OFF = Office Building; CRS = Community Resilience Shelter; CWH = Construction Worker Housing

3.8.4.1 Final Design Report

This section contains the requirements the **Final Design Report** for SDI 2023-24. 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'.

Maximum page count: Strictly 38 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:
 - a. Logo of Solar Decathlon India
 - b. Name of your Institution(s) and (logos optional)
 - c. Team Name and (logo optional)
 - d. Competition Division
 - e. Name of Project Partner and (logo optional)
 - f. Deliverable name as "Final Design Report – April 2024"
2. **Table of Contents**
3. **List of Tables**
4. **List of Figures**
5. **Executive Summary (strictly 1 page)**: 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.
6. **Response to reviewers' comments**⁵: Provide a summary list of the reviewer's comments to your Deliverable 3, and your responses including actions you have taken.

⁵ Teams should refer to "Template for responding to the reviewers' comments" under the Survival Kit on the LMS.

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

7. Introduction (7 pages)

- a. Project Name
- b. Who: Team name; list of team members and their roles; institution(s) name and background; project partner name, background and name and designation of key individuals involved; industry partner(s) role, name, background and name and designation of key individuals involved; occupant profile; and other stakeholders important to your project.
- c. Why: The need for the project; brief description of context with site, location, and climate; the purpose (Build-own-operate, build-sell, build-own-lease/operate),
- d. Why: The need for the project; brief description of context with site, location, and climate; the purpose (Build-own-operate, build-sell, build-own-lease/operate),
- e. How: Description of your design process.

8. Design documentation (up to 30 pages)

- a. Demonstrate your performance on the 10 contests. Refer to Section 3.7 'Ten Contests and their Requirements'. 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 section 3.7.

9. References, if any

10. Appendix (up to 50 pages)

Provide at minimum:

- a. Detailed building area program - (up to 1 page)
- b. Architectural drawings
- c. Engineering drawings
- d. Outline specifications of relevant building systems limited to two pages.
- e. Energy simulation inputs. Refer to the template and example for "List of inputs and outputs parameter" inside the 'Survival Kit' on the LMS.
- f. Net-zero water-cycle design and calculations
- g. Summary of Cost Estimate (Revised from D3 as needed). Add the 'Project Summary' worksheet' from the 'Cost Estimation' template inside the 'Survival Kit' on the LMS
- h. Summary of Embodied Carbon calculations. Add the 'Summary' worksheet from the 'Embodied Carbon' calculation tool inside the 'Survival Kit' on the LMS.

- i. 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' on the LMS
- j. List of key parameters to measure the performance of the building. Refer to the guidance document on this inside the 'Survival Kit' on the LMS.

Letters of Confirmation (as many pages as needed)

- a. Letter of Confirmation from Project Partner
- b. Letter of Confirmation from Industry Partner(s)

3.8.4.2 *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, 6 May 2024**.

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

Format requirements

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

3.8.4.3 *Division Jury Presentation*

Each team prepare and submit one presentation for the SDI Finals event. Teams will deliver a **20-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, 13 May 2024**.

3.8.4.4 *Grand Jury Presentation*

Each team prepare and submit one presentation for the SDI Finals event. Division winners will deliver the **5-minute pitch** with additional time for questions and answers to the Grand Jury on **19 May 2024**. Division Winners will be announced on the morning of May 19, 2023. Teams must

follow the format requirements and submit the presentation before the deadline i.e., **5 pm IST, 13 May 2024.**

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

- File type: '.pptx' (Ensure the slides are in the aspect ratio of 16:9)
- 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).
- File size: **Up to 200 MB**; and maximum slide count: No limit.
- To ensure that all electronically submitted materials work with the organizers' presentation computers, teams should embed all videos in the team submission.
- Headers and footer: Header may have logo of your team and Solar Decathlon India. Footer must have slide number and your team's name.

3.8.4.5 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 SDI Finals event. Teams should carry print(s) of their poster to the SDI Finals event. Teams must also submit a soft copy of their poster to SDI organisers before the deadline i.e., **5 pm IST, 13 May 2024.**

4 Product Division

There is one Product Division in the 2023-24 challenge. Teams are required to develop a tested prototype for their product solution.

4.1 Residential Cooling Retrofit (RCR)

All new construction that is not built as climate resilient or net-zero presents a huge challenge for India's climate goals and needs to be addressed through retrofit of existing buildings. About 80% of India's existing building stock will continue to be residential buildings, where cooling needs attention because of the potential exposure to heat stress, and growth in space cooling energy and related carbon emissions.

The Residential Cooling Retrofit is a challenge to 'make' solutions that improve cooling performance in existing residential buildings, where the solution could be implemented by the resident with minimal assistance from a technician, such as an electrician or a carpenter. Teams can develop solutions in a range of domains, including building envelope, dynamic shading, passive cooling techniques, active cooling, appliances, and smart controls. Solutions can also overlap across these domains. Solutions are expected to be original, unique, creative, innovative, feasible, functional, and of good quality.

For this Division, the following requirements apply:

- a) The solution should demonstrate reduction in cooling (thermal) load, or reduction in energy consumption for cooling.
- b) The solution should apply to an existing residential space. There is no restriction on the size and typology of the residence.
- c) The solution should be developed as a product that a resident may be able to buy-off-the-shelf.
- d) The solution should be easy to install with minimal assistance from a technician.
- e) The result should be a tested prototype.

4.2 Forming a team

4.2.1 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. It is recommended that teams include a range of disciplines such as engineering, architecture, product design, industrial design, management, UX design, computer science, robotics, and others depending on the proposed solution. Students from multiple colleges can collaborate to form a 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.

4.2.2 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.

4.2.3 Industry partner

Each team must have at least one committed Industry Partner. Industry Partners can provide support for materials, equipment, know-how, and facilities for making or testing, and they should be interested or invested in the outcome of the team.

4.2.4 Equipment

All teams need to have access to tools and equipment through workshops or labs within their institution, or through locally available maker spaces, fablabs, or tinkering labs. Teams are encouraged to explore equipment and facilities for making and testing that could be provided by their Industry Partner.

Note: SDI organisers will not provide any equipment or facilities for making or testing.

4.3 Ten Contests and Their Requirements for the Product Division

The ten contests of the Product Division cover diverse areas that embody the expectations of a successful product. Teams must address all ten contests in their product solution.

Note: The requirements marked with * will be evaluated in Deliverable 3 and all requirements will be evaluated in Deliverable 4. Please see Section 4.4 for the detailed outline for each Deliverable.

4.3.1 Value Proposition

This contest evaluates the team's ability to convey a compelling value proposition to both investors and end users. The value proposition should estimate the total environmental impact, such as the emissions resulting from adoption of the solution by the target market. A value proposition goes beyond a simple ROI calculation, to summarise select achievements in the other nine contests. It should be clear and succinct, including tangible and intangible benefits to the end users, to convince them to choose the product. It should build a strong narrative that enables an investor to see the potential success of the solution.

The contest requirements are:

- ***Completeness and clarity** of the deliverable.
- ***Compelling case for end users** with clear messaging and articulation of the value proposition, documented in the form of a print advertisement for users.
- **Compelling case for a potential investor** with clear messaging and articulation of the value proposition, documented in the form of an elevator pitch of 200 words or less.

4.3.2 Novelty

This contest evaluates the novelty of the solution in its ability to bring new materials, techniques, technologies, algorithms, methods, etc. to address the problem. Novelty is likely to result in

intellectual property created within the solution. New products will be considered novel, but a new way of using existing products may not be considered novel, unless teams are able to show significant value-add through techniques, algorithms, and methods while using existing products.

The contest requirements are:

- ***Comparison of your product** with two most similar products, describing its distinctiveness and superiority through narratives, diagrams, and photographs.
- **Novel aspects** of your solution that may result in the creation of the intellectual property, described through narratives, diagrams, or photographs.

4.3.3 Target Market

This contest evaluates the identification and quantification of the potential market for the product. A larger market size typically translates into potential for wider adoption, increased accessibility and affordability, and potential for a larger impact. Teams should evaluate and quantify the market size for their product for a wider target of users, peripheral use-cases, national or international regions with similar climatic conditions. Teams should also identify their beachhead market.

The contest requirements are:

- ***Broad target of users** documented with description, demographics, and market size.
- ***Personas of target users** documented with descriptions and your reasons for why they are likely to adopt your solution.
- **Early adopters** documented with description and market size, and your reasons for why they are likely to buy your solution.

4.3.4 User Desirability

This contest evaluates the desirability of the product from the perspective of end-users. A great product or solution will not be adopted by the users unless the product is also desired by them. Factors such as user-friendliness, aesthetic appeal, and user satisfaction count towards user desirability. Team should corroborate these through primary research techniques (such as surveys, interviews, focus groups, and observations).

The contest requirements are:

- ***Description of primary research techniques** that you used for assessing user desirability.
- ***Quantitative and qualitative results** of your research documented with narratives, diagrams, and photographs.

4.3.5 Cooling Performance

This contest evaluates the solution's effectiveness for cooling performance. Solutions that aim to only reduce cooling energy through equipment should demonstrate the amount of energy reduced compared to a baseline case. Solutions that aim to reduce discomfort hours and heat stress should demonstrate the reduction in cooling (thermal) load compared to a baseline case. Performance should be demonstrated through measurements during the testing of a prototype.

The contest requirements are:

- ***Performance testing method** explained with narratives, diagrams, and photographs, listing measurement equipment and calculation procedures.
- ***Reduction of cooling energy⁶** while maintaining adaptive comfort. This should be demonstrated with results of measurements during testing of the prototype and compared with a baseline case by following the cooling measurement pathway as described in the "*Testing protocol for the Cooling Performance contest*" provided in the survival kit. **OR**
- ***Reduction of cooling (thermal) load** while maintaining adaptive comfort. This should be demonstrated with results of measurements during testing of the prototype compared with a baseline case by following the comfort measurement pathway as described in the "*Testing protocol for the Cooling Performance contest*" provided in the survival kit.

4.3.6 Co-benefits

This contest evaluates the solution's ability to provide other benefits to the users. Co-benefits add value to the product or solution by going beyond the core performance-related issue, often solving other problems experienced by the users. Teams should conduct user research and identify problems to address them into the proposed solution, thus providing co-benefits beyond the core performance-related issue. Co-benefits can include but are not limited to, improved health, well-being, flexibility of use, integration with other building components, and product lifecycle. Teams should conduct user surveys, studies, or measurements, to corroborate that the solution is able to provide the expected co-benefits.

The contest requirements are:

- ***Testing methods** explained with narratives, diagrams, and photographs, including measurement equipment (if any) and calculation procedures.
- ***Test results**, describing the additional benefits to the users.
- **Modification of your product** based on findings of the test results, for the benefit of the users.

4.3.7 Ease of Installation

This contest evaluates the simplicity and convenience of installing the proposed solution. Users should be able to install and operate the product or solution with minimal assistance, or as a completely DIY installation. Teams should prepare an installation and operation guide that shows the ease of installation.

The contest requirements are:

- ***Ease of installation** demonstrated by a narrative and list of the tools and expertise needed for the installation.

⁶ Cooling energy reduction can be measured if your baseline condition of the target market condition uses active energy or appliances for cooling. Thermal load reduction should be measured if your baseline condition of the target market condition uses only passive techniques to provide comfort.

- **Method and time required for installation** documented in a video showing the installation process.
- **Installation and operation guide** in distinct steps with graphical or text instructions, as appropriate.

4.3.8 Technical Feasibility

This contest evaluates the use of materials, components, and their availability, along with the potential for scalability of the processes involved to make the product. Sound engineering of the product for robust performance in the conditions of use is needed. If appropriate, teams should demonstrate the compatibility of the product with the infrastructure available in existing buildings.

The contest requirements are:

- ***Compatibility of the product** with the infrastructure available in existing buildings demonstrated through narrative and graphics.
- **Engineering design** considered by you to improve the technical aspects of the design, reduce waste, reduce time of making, and improve the life of the product.
- **Scaling potential** demonstrated by description of materials, people, and processes needed, and their availability.

4.3.9 Financial Feasibility

This contest evaluates the financial feasibility of the solution. Appropriate pricing makes the production and sales of the product a viable business, and attractive to potential investors. It is important to understand the price that users are willing to pay for the product using a value based-pricing approach, and to build a cost-plus pricing model that includes the manufacturing and sales costs, and the profit. Teams should use these two approaches to demonstrate the financial feasibility of the solution and identify challenges such as the need for more efficient manufacturing, government rebates, etc. if the cost-plus price exceeds the value-based price, or opportunities for adding features, increased R&D, increased profitability if the value-based price exceeds the cost-plus price.

The contest requirements are:

- ***Value-based price** discovered through user desirability testing, documented through narratives and calculations, and graphics.
- **Cost-plus price** that includes the manufacturing and sales costs along with a margin for profit, documented through narratives, calculations, and graphics.
- **Future strategy** resulting through comparison of the value-based and cost-plus prices.

4.3.10 Go-to Market Strategy

This contest evaluates the team's approach to developing a business. It includes the marketing plan, the team, and the Industry Partners' commitment. A strong marketing plan is an important aspect of a larger business plan, and explains the competitors, the beachhead market, a pricing strategy, and marketing channels. A diverse team in terms of skills and knowledge, is likely to generate better solutions for a robust business, thereby giving confidence to investors.

Committed Industry Partner/s provide support for materials, equipment, know-how, and

facilities for making or testing, along with an interest in the outcome, to help the team achieve its potential. Teams should include ideas or arrangements for protecting or sharing intellectual property or licensing products and services. The go-to-market strategy should be written for a potential investor.

The contest requirements are:

- ***Team composition** in terms of diversity of skills, and roles envisioned for key members, including sales and marketing.
- ***Industry partner's involvement** explained with the resources they provide, their interest in the team's success, financial arrangements established with them, and ideas or arrangements for intellectual property ownership and licensing.
- **Marketing plan** illustrated using the format provided under the 'Survival Kit' on LMS.

4.4 Deliverables for Product Division

This section provides detailed requirements of the Deliverables for the 2023-24 Challenge of the Product Division. The four deliverables are expected to be the outcome of the four stages of work as shown below in figure 1.

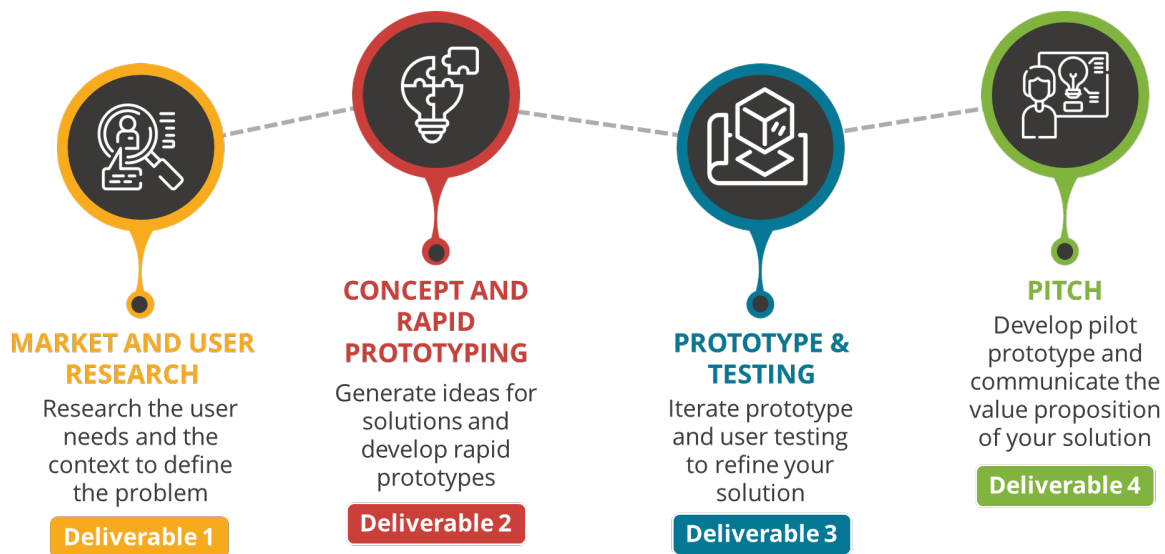


Figure 1: Four-stage deliverable topics within the Product Division

- 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.

4.4.1 Details for Deliverable 1

This section contains the requirements for **Deliverable 1** (i.e., the **Market and User Research Report**) for SDI 2023-24 challenge. Teams must strictly follow the instructions listed in Table 5, below.

Table 5: Solar Decathlon India Deliverable 1 for Product Division - File Naming Conventions and Deadlines

Deliverable	Required Content	File Name	Deadline
Market and User Research Report	Single Bookmarked PDF	D1_[DivisionLetterCode]_(TeamName).pdf for e.g., D1_RCR_TeamName.pdf	3 - 10 October 2023, 5 pm IST

4.4.1.1 Market and User Research Report

The Market and User Research Report shall describe the context, user research, description of the people you are designing the product for, problem definition, objectives, and success metrics, as well as a project summary and a team summary.

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 'Market and User Research Report – October 2023'
- 2. Context of the problem** (up to 1 page): Brief description of the context of your problem (including but not limited to location, climate zone, description of residential spaces and demographics of the people considered for the retrofit solution).
- 3. Market and User Research** (up to 3 pages):
 - a. List and analyse a range (at least 3) of existing products/ solutions that could be potential solutions to the problem. Describe both the successful and unsuccessful features and approaches employed by these products/ solutions.
 - b. List the questions asked to understand the users' concerns related to cooling and thermal comfort. Also list the questions asked to understand how users think, feel, and behave related to the context of this problem. Include any additional questions asked to guide your project design.
 - c. Describe your research methods such as interviews, surveys, observations, secondary data, usability testing, etc.
- 4. Insights** (up to 2 pages):
 - a. Describe insights and inspiration that you gained from the market analysis to inform your own ideas.
 - b. Summarise the key findings from your research, emphasising the sample size, target audience profile, and users' current approach to cooling. Highlight the needs, problems, motivations, and aspirations of the users that you discovered. Present any patterns or trends that you found in the data in a clear and understandable way.
 - c. Describe the opportunity areas that were identified based on your research.
- 5. Project Summary** (up to 5 pages):
 - a. Problem definition: Describe the opportunity that you have selected to solve with your cooling retrofit product. Outline the challenges that you have identified and why are they important.
 - b. Objectives and Metrics: List the objectives of your project. Define specific metrics that will help assess how your solution meets the objectives.
 - c. Scope of your project: Describe the building systems, components, etc, that your solution will be composed of. Also, mention any limitations or restrictions that your solution may have and list the situations where it may not work effectively.
 - d. Users: Describe the specific target audience for your product. Provide detailed information about their characteristics.
 - e. Stakeholders: Identify other stakeholders who are important to consider and explain why they matter to make your project successful.
 - f. Product name: This can be something you and/or your Industry Partner have come up with. This can be modified in the subsequent stages.
- 6. Ideation** (up to 2 pages): Describe your brainstorming/ ideation process formed through research insights that have helped in developing various alternative solutions. List various alternative ideas that emerged during the ideation stage.
- 7. 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 the organisation of your team for working on SDI and your team's work process

- f. Background of the lead institution, mention degree programmes and coursework relevant to the 10 contests of the Challenge (about 50 words)
 - g. Resources: Discuss your team's access to labs, equipment, makerspaces, fablabs etc.
 - h. Faculty Lead and Faculty Advisors – Name, designation, relevant bio (not more than 25 words each)
 - i. Names of Industry Partners and their expected support to your team
- 8. Appendix:** Letter of Confirmation from Industry Partner(s), using the template provided to you in the LMS.

Feedback Criteria

Feedback will be provided on the following:

- Compliance with Division and the context of the problem
- Market and User research
- Insights from research
- Project summary
- Team composition

4.4.2 Details for Deliverable 2

This section contains the requirements for **Deliverable 2** (i.e., the **Concept and Rapid Prototyping Report**) for SDI 2023-24 challenge. Teams must strictly follow the instructions listed in Table 6, below.

Table 6: Solar Decathlon India Deliverable 2 for Product Division - File Naming Conventions and Deadlines

Deliverable	Required Content	File Name	Deadline
Concept and Rapid Prototyping Report	Single Bookmarked PDF	D2_[DivisionLetterCode]_(TeamName).pdf e.g., D2_RCR_TeamName.pdf	21 - 28 November 2023, 5 pm IST

4.4.2.1 Concept and Rapid Prototyping 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

- a) 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.
- b) 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** (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 'Concept and Early Prototyping Report – November 2023'
2. **Table of Contents**
3. **List of Tables**
4. **List of Figures**
5. **Response to reviewers' comments⁷**
 - 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 their roles
 - e. Approach: Description of the organisation of your team for working on SDI and your team's work process
 - f. Background of the lead institution, mention degree programmes and coursework relevant to the 10 contests of the Challenge (about 50 words)
 - g. Resources: Discuss your team's access to labs, equipment, makerspaces, fablabs etc.
 - h. Faculty Lead and Faculty Advisors – Name, designation, relevant bio (not more than 25 words each)
 - i. Names of Industry Partners and their expected support to your team
7. **Context of the problem** (up to 1 page, revised from Deliverable 1 as needed): Brief description of the context of your problem (including but not limited to location, climate zone, description of residential spaces and demographics of the people considered for the retrofit solution).
8. **Project Summary** (up to 3 pages, revised from Deliverable 1 as needed):
 - a. Problem definition: Describe the opportunity that you have selected. Talk about the challenges you have identified and why they are important.
 - b. Objectives and Metrics: List the objectives of your project. Define specific metrics that will help assess how your solution meets the objectives.
 - c. Scope of your project: Describe the building systems, components, etc, that your solution will be composed of. Also, mention any limitations or restrictions that your solution may have and list the situations where it may not work effectively.
 - d. Users: Describe the specific target audience for your product. Provide detailed information about their characteristics.

⁷ Teams should refer to "Template for responding to the reviewers' comments" under the Survival Kit on the LMS.

- e. Stakeholders: Identify other stakeholders who are important to consider and explain why they matter to make your project successful.
 - f. Product name: This can be something you have come up with, or something from your Industry Partner. This can be modified in the subsequent stages.
- 9. Ideation** (up to 2 pages): Describe your brainstorming/ ideation process formed through research insights that have helped in developing various alternative solutions. List various alternative ideas that emerged during the ideation stage.
- 10. Design Concepts** (up to 11 pages): Document five design concepts which are distinct from each other based on the chosen opportunity. For each design concept, provide the following information:
- a. Salient features of the cooling retrofit product.
 - b. Explain who needs this cooling solution the most, the market gap it fills, the unmet needs it serves, and how it benefits users/stakeholders.
 - c. Outline the process and materials required for prototyping the design concept.
 - d. Document the following for the rapid prototypes that are developed for the five-design concepts.
 - i. Provide drawings, photos, links to videos, etc. that document your prototypes.
 - ii. Describe how you tested your models or rapid prototypes.
 - iii. Document the results and findings of your testing.

Note: Rapid prototyping is a step within the product development process that quickly iterates upon an initial design concept. The primary focus is to test form, fit, and function of the product or its components. They can be low fidelity models, as a combination of drawings, storyboards, computer simulations, or physical models made of paper or other quick-to-model materials. Rapid prototypes enable the designers to test certain aspects of the product or solution and can be discarded or modified quickly as the designers continue to iterate the solution. A rapid prototype is not same as your Deliverable 3 prototype.

- 11. Shortlisted concept** (up to 2 pages): Evaluate your test results and provide a comparative analysis of your design concepts through thought experiments. Shortlist the concept you are moving forward with. Describe your iterative process for building, testing, and improving the selected design to move into user testing of final prototype in real-life residential projects.
- 12. Contest areas** (up to 3 pages): For one shortlisted concept, describe your expectations for the following contest areas.
- a. Cooling Performance: Describe your baseline case. Describe how the solution you develop will improve cooling performance compared to the baseline (mechanics of improved performance). Describe how much you expect this cooling performance to improve in your final prototype.
 - b. Co-benefits: List and describe the expected co-benefits that your product will provide beyond the cooling performance.
 - c. User desirability: Describe the user-friendliness of your solution and explain why it will be accepted by the target audience, ensuring their satisfaction with the retrofit product.
 - d. Technical Feasibility: Mention the materials used, components, and their availability, along with the potential for scalability of the processes involved to make the product. Demonstrate the compatibility of the cooling retrofit solution with the infrastructure available in existing residential buildings.

- e. **Novelty:** Identify the uniqueness and novelty in your solution, particularly in terms of introducing new/innovative materials, techniques, technologies, algorithms, methods, or other relevant aspects to address the problem at hand.

Note: In Deliverable 2, the requirements of the contest areas are meant to be expectations and not the results of any testing.

13. Appendix: Letter of Confirmation from Industry Partner(s) (revised from Deliverable 1 if needed)

Feedback Criteria

Feedback will be provided on the following:

- Your responses to Deliverable 1 comments
- Design concepts, rapid prototypes, and testing
- Expectations described for the contest areas

4.4.3 Details for Deliverable 3

This section contains the requirements for **Deliverable 3** (i.e., the **Prototype Test Report, Product Ad**) for SDI 2023-24 challenge. This is an **elimination round**. The finalist teams will be shortlisted based on the Judging Criteria. Teams must strictly follow the instructions listed in Table 7, below.

Table 7: Solar Decathlon India Deliverable 3 for Product Division - File Naming Conventions and Deadlines

Deliverable	Required Content	File Name	Deadline
Prototype and Test Report	One Single bookmarked PDF file (less than 30 MB), (including Appendix)	D3_[DivisionLetterCode]_(TeamName).pdf e.g., D3_RCR_TeamName.pdf	20 – 27 February 2024 5 PM IST
Product Ad	One Single bookmarked PDF file (less than 30 MB): One A0 sheet in landscape (soft copy)	D3_Ad_[DivisionLetterCode]_(TeamName).pdf e.g., D3_Ad_RCR_TeamName.pdf	20 – 27 February 2024 5 PM IST

4.4.3.1 Prototype Test Report

This is an interim submission to demonstrate the team's progress towards completing the project. Teams are required to create an operational prototype that integrates all the desired features, evaluate its usability and performance, and present the entire process and results. The deliverable includes the main report, appendix, and letters of confirmation, submitted as one single PDF document, and a separate PDF document of the Print Ad. Teams must adhere to the

page limit and content outline provided below. Submissions exceeding the page limit may be disqualified.

Maximum page count: Strictly 25 pages, excluding the cover page, response to reviewers' comments, list of figures and tables, references, and appendix. Submissions exceeding 25 pages may not be reviewed for feedback.

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 'Prototype and Test Report – November 2023'
- 2. Table of Contents**
- 3. List of Tables**
- 4. List of Figures**
- 5. Response to reviewers' comments⁸**
 - g. 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): The executive summary should contain the highlights of what you would like the jury to know about your team, your process, and your design solution, or your achievements.

Note: The executive summary should not be just an introduction. It should provide an overview of the problem you worked on, what you have been able to achieve, and your next steps towards completing the challenge. Make sure you mention the target market and the value proposition.
- 7. Introduction** (up to 4 pages)
 - a. Product Name.
 - b. Who: Team name, list of *team* members and their roles, *institution(s)* name and background, *industry partner(s)* name, background and name and designation of key individuals involved. Describe your *users* and other *stakeholders* who may be important to make your project successful.
 - c. Why: Description of the *problem* along with the *context*, description of residential spaces considered for the retrofit solution, *climate, opportunities, and challenges* identified from your research.
 - d. What: A brief description of your *solution* with its systems, components, etc. Mention any *limitations* of your solution and list the situations where it does not work effectively. List

⁸ Teams should refer to "Template for responding to the reviewers' comments" under the Survival Kit on the LMS.

the *objectives* of your project. Define specific *metrics* used to assess how your solution meets the objectives.

- e. How: Brief description of your product development *process*.

8. Contest documentation (up to 20 pages)

- a. Provide documentation for each requirement of the 10 contests applicable to Deliverable 3. Refer to Section 4.3.
- b. You must follow the order of the ten contests in Section 4.3.

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

Note: The reviewer may visit the site where your prototype is installed.

9. References, if any

Appendix (up to 10 pages, excluding letters of confirmation)

- Conceptual drawings/ photographs
- Engineering drawings
- Specification of the elements/products used (if any)
- Testing criteria and methodology

Letters of Confirmation (as many pages as needed)

1. Letter of Confirmation from Industry Partner(s)
2. 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.

4.4.3.2 Product Ad

Teams should submit one compelling product ad in a poster format. The poster size should be one A0 sheet (in landscape) or two A1 sheets (in portrait). Teams must submit a soft copy of their poster to SDI organisers before the deadline i.e., 5 pm IST, 27 February 2024.

Feedback Criteria

The deliverable will be reviewed as per the 'Judging Criteria'. Teams are expected to read the 'Ten Contests and their Requirements' section for the Product Division 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

4.4.4 Details for Deliverable 4

This section contains the requirements for **Deliverable 4** (i.e., **Final Report, Product Ad, Movie, SDI Finals Presentations, Poster**) for SDI 2023-24 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 8, below.

Table 8: Solar Decathlon India Deliverable 4 for Product Division - File Naming Conventions and Deadlines

Deliverable	Required Content	File Name	Deadline
Final Report	One single Bookmarked PDF i.e., Final report (including Appendix)	D4_[DivisionLetterCode]_(TeamName).pdf e.g., D4_RCR_TeamName.pdf	11- 18 April 2024 5 PM IST
Step-by-Step Installation	1-minute or less - short video	INSVID_[DivisionLetterCode]_(TeamName).mp4 e.g.: INSVID_RCR_TeamName.mp4	11- 18 April 2024 5 PM IST
Movie	3-minute or less - short movie	MOVDC_[DivisionLetterCode]_(TeamName).mp4 e.g.: MOVDC_RCR_TeamName.mp4	1 - 6 May 2024 5 PM IST
Division Jury presentation	Single MS Powerpoint file (up to 200MB)	PRESJ_[DivisionLetterCode]_(TeamName).pptx e.g., PRESJ_RCR_TeamName.pptx	6 - 13 May 2024 5 PM IST
Grand Jury presentation	Single MS Powerpoint file (up to 200MB)	PRESGJ_[DivisionLetterCode]_(TeamName).pptx e.g., PRESGJ_RCR_TeamName.pptx	6 - 13 May 2024 5 PM IST
Product Ad	One Single PDF file: Product Ad One A0 sheet in landscape	D3_Ad_[DivisionLetterCode]_(TeamName).pdf e.g., D3_Ad_RCR_TeamName.pdf	6 - 13 May 2024 5 PM IST

4.4.4.1 Final Report

This section contains the requirements the **Final Report** for Solar Decathlon India 2023-24. 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'.

Maximum page count: Strictly 35 pages, excluding the cover page, response to reviewers' comments tables of content, list of figures and tables, references, and 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)
 - a. Logo of Solar Decathlon India
 - b. Name of your institution(s)
 - c. Team name
 - d. Competition division
 - e. Name of Industry Partner and (logo optional)
 - f. Deliverable name as 'Final Report – April 2024'

2. Table of Contents**3. List of Tables****4. List of Figures****5. Response to reviewers' comments⁹:** Provide reviewers' comments to your Deliverable 3 and your response to each comment mentioning any actions you have taken.

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

6. Executive Summary (strictly 1 page): The executive summary should contain the highlights of what you would like the jury to know about your team, your process, and your design solution, or your achievements.

Note: The executive summary should not be just an introduction. It should provide an overview of the problem you worked on, what you have been able to achieve, and your next steps. Make sure you mention the target market and the value proposition.

7. Introduction (up to 4 pages, revised from Deliverable 3 as needed):

- a. Product Name.
- b. Who: Team name, list of *team* members and their roles, *institution(s)* name and background, *industry partner(s)* name, background and name and designation of key individuals involved. Describe your *users* and other *stakeholders* who may be important to make your project successful.
- c. Why: Description of the *problem* along with the *context*, description of residential spaces considered for the retrofit solution, *climate, opportunities, and challenges* identified from your research.
- d. What: A brief description of your *solution* with its systems, components, etc. Mention any *limitations* of your solution and list the situations where it does not work effectively. List the *objectives* of your project. Define specific *metrics* used to assess how your solution meets the objectives.
- e. How: Brief description of your product development *process*.

8. Contest documentation (up to 30 pages)

- a. Provide documentation for each requirement of the 10 contests. Refer to Section 4 "Ten Contests and their Requirements" in the Solar Decathlon India 2023-24 Competition guide. *Remember, each Contest carries the same weight for scoring. Include photographs, and video links as needed.*
- b. You must follow the order of the ten contests in Section 4.

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

Note: You will need to bring your prototype to the SDI Finals 2024 event.

9. References, if any**Appendix (up to 10 pages, excluding letters of confirmation)**

- Conceptual drawings/ photographs

⁹ Teams should refer to "Template for responding to the reviewers' comments" under the Survival Kit on the LMS.

- Engineering drawings
- Specification of the elements/products used (if any)
- Testing criteria and methodology

Letters of Confirmation (as many pages as needed)

- Letter of Confirmation from Industry Partner(s)

4.4.4.2 Step-by-Step Installation

Teams should submit a 1-minute-long video documenting the installation process. This video is as part of the “Ease of Installation” contest requirement. All content in the movie, including graphics, images, must be original and should not include any copyrighted material. 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 video before the deadline i.e., **5 pm IST, 18 April 2024**.

Format requirements

1. Length: up to 1 minute
2. File type: '.mp4'
3. File size: up to 150 MB
4. Resolution and aspect ratio: 1920 X 1080

4.4.4.3 Movie

Teams should submit a 3-minute long movie. The movie should tell an inspiring story of your product 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. By submitting the video, the team grants the SDI organisers the right to edit the video in alignment with SDI branding and post to the 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, 6 May 2024**. 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

4.4.4.4 Division Jury Presentation

Each team prepare and submit one presentation for the SDI Finals event. Teams will deliver a **20-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, 13 May 2024**.

4.4.4.5 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 **19 May 2024**. Division Winners will be announced on the morning of **19 May 2024**. Teams must follow the format requirements and submit the presentation before the deadline i.e., **5 pm IST, 13 May 2024**.

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.

4.4.4.6 Product Ad

Teams should submit one compelling product ad in a poster format. The poster size should be one A0 sheet (in landscape) or two A1 sheets (in portrait). Teams will have the opportunity to exhibit their ad during the 'Poster Session' in the SDI Finals event. Teams should carry print(s) of their ad to the SDI Finals event. Teams must also submit a soft copy of their poster to SDI organisers before the deadline i.e., **5 pm IST, 13 May 2024**.

5 Judging

Teams are assessed based on the Deliverables they submit and their presentations in the finals. 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.

5.1 Judging criteria

All 10 contests have equal weightage, and each contest will be judged based on the scale below:

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

5.2 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.

Note: Each team must include a 'Response to Reviewer comments' in Deliverables 2, 3, and 4. 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. 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 SDI Finals event.
- The Intermediate Presentation (in Building Division) is reviewed by panel of industry jury and wild card entries (if any) are chosen based on these presentations.
- 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.
- For the SDI Finals Division Presentations, the panel of three jurors assesses the quality of the presentation, the information presented, and how the team has incorporated comments given to them for Deliverable 4. Based on this assessment, the Jurors may decide to revise their scores that they had given earlier for Deliverable 4.
- For the SDI Finals Grand Jury, the Grand Jury members will assess the 5-minute pitches of the Division winners and award the Grand Prize to the project that is deemed to be the most investment-worthy.

6 Schedule

Solar Decathlon India 2023-24 Schedule																																																				
	Jul				Aug				Sep				Oct				Nov				Dec				Jan				Feb				Mar				April				May											
	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																																																				
Deliverable 2																																																				
Stage 2 Competition																																																				
Deliverable 3																																																				
Finalists announced																																																				
Deliverable 4																																																				
SDI Finals' Movie																																																				
SDI Finals' Presentation & Posters																																																				
SDI Finals event																																																				

- Stage 1 of the competition formally begins on 01 September 2023. However, teams that register earlier are welcome to start working before that.
- Similarly, Stage 2 of the competition formally begins in January 2024. However, teams are welcome to start working on Stage 2 in December, soon after submitting Deliverable 2.

6.1 Deliverables and due dates

- Registration closes at 5 pm on 31 August 2023.
- Deliverable 1: Due by 5 pm on 10 October 2023.
- Deliverable 2: Due by 5 pm on 28 November 2023.
- Self-learning Modules to be completed by 5 pm on 08 January 2024.
- Deliverable 3: Due by 5 pm on 27 February 2024.
- Deliverable 4 - Final Design Report: Due by 5 pm on 18 April 2024.
- Movie: Due by 5 pm on 06 May 2024.
- Division Jury Presentation slides: Due by 5 pm on 13 May 2024.
- Grand Jury Presentation slides: Due by 5 pm on 13 May 2024.
- Posters: Due by 5 pm on 13 May 2024.

6.2 Events

- Faculty Development Programme for Faculty Leads and Faculty Advisors: Week of 11 September 2023.
- Ticket to Finals: The finalists' teams of the 2023-24 Challenge will be declared on 12 March 2024. Details of the event will be shared with faculty leads and team leads closer to the event.

- c. SDI Finals¹⁰: The selected teams (finalists) will present their work during the SDI Finals on 17-19 May 2024. Details of the event will be shared with faculty leads and team leads closer to the event.
- d. Grand Jury¹: Division Winners will present their work in a 5-minute pitch to the Grand Jury on 19 May 2024. Division Winners will be announced on the morning of 19 May 2024.

¹⁰ Format and nature of these events are subject to change due to the COVID-19 situation and government regulations on social-distancing. Note: All times are in IST.

7 Resources available to teams

7.1 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.

7.2 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.

7.3 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.

7.4 Guidance for pitching

The SDI organisers provide a handout to the participating teams to explain to Project Partners (relevant for teams competing in Building Division) and Industry Partners (relevant to teams competing in Product Division) the benefits they get and clarify their role and commitment. Teams should also refer to guidance documents to approach Partners in the survival kit.

7.5 Faculty Guide

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

7.6 Survival Kit

Teams should refer to the various resources provided by the organisers under the 'Survival Kit' in the LMS. These include guidance documents, best practices, templates, and lists of past partners.

7.7 Past submissions

Works submitted by finalist teams who have participated in the past are posted on the SDI website. The teams should review this work.

8 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.

9 Version Control

#	Date of publishing	Version	Summary of changes/ updates
1	July 2023	1.0	<ul style="list-style-type: none"> • Not applicable
2	September 2023	1.1	<ul style="list-style-type: none"> • Contest requirements of building division added. • Details of Deliverable 3 and 4 for building division added. • Judging process for building division added. • Contest requirements of product division added. • Details of Deliverable 1, 2, 3, and 4 for product division added. • Judging process for product division added.
3	September 2023	1.2	<ul style="list-style-type: none"> • Contest requirements of 'Affordability' under building division updated. • Deliverable 1 outline: Under #3 (Project summary, point 'g'), the format of construction budget is provided inside the 'Survival Kit' on the LMS and NOT in 'Appendix'.
4	January 2024	1.3	<ul style="list-style-type: none"> • Contest requirements of '4.3.5 Cooling Performance' for the Product Division updated, specifically with the two requirements below: <ul style="list-style-type: none"> ○ *Reduction of cooling energy while maintaining adaptive comfort. This should be demonstrated with results of measurements during testing of the prototype and compared with a baseline case by following the cooling measurement pathway as described in the "<i>Testing protocol for the Cooling Performance contest</i>" provided in the survival kit. OR ○ *Reduction of cooling (thermal) load while maintaining adaptive comfort. This should be demonstrated with results of measurements during testing of the prototype compared with a baseline case by following the comfort measurement pathway as described in the "<i>Testing protocol for the Cooling Performance contest</i>" provided in the survival kit.

10 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*



Gol Support



Knowledge Partner†



Programme Support‡



Affiliates‡



* The roles and responsibilities of AEEE and IIHS are separate and distinct, with independent budgets, financial resources and execution.

† AEEE and COA have signed a Memorandum of Understanding for knowledge collaboration on net-zero buildings in India.

‡ The American Council for an Energy Efficiency Economy (ACEEE) has funded AEEE for activities relating to SDI.

‡ ISHRAE (India) and IEEE SA (India) are acting as outreach partner to SDI. Solemma provides free software licenses to all student participants and faculty mentors for the SDI competition. There is no financial implication. The respective teams at their own risk and responsibility, may enter into relevant agreement(s) with Solemma for use of the Solemma software. Teams are however free to use any dynamic simulation modelling software of their choice. Climate Launch Pad India to provide incubation to finalist team(s) of SDI.



For more information, visit
SolarDecathlonIndia.in

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Alliance for an Energy Efficient Economy