

# TUNNELLING ASIA 2023

International Conference on  
Climate Resilience and Sustainability in Tunnelling and Underground Space  
22-23 November 2023, Mumbai, India

&

9<sup>th</sup> Edition of ITA TUNNELLING AWARDS 2023

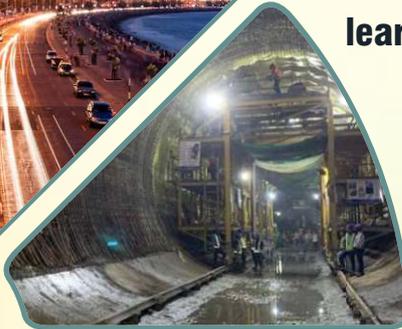
24 November 2023, Mumbai, India

Venue:

Hotel ITC Maratha, Mumbai, India

Outstanding event to meet,  
learn and celebrate in Mumbai, India

22<sup>nd</sup> - 24<sup>th</sup>  
November 2023



Call for  
Papers

Call for  
Entries  
**TAI Award**  
[www.tai.org.in/tai-awards/](http://www.tai.org.in/tai-awards/)

Call for  
Entries  
**ITA Awards**  
<https://awards.ita-aites.org>

Also available in Virtual

- ✓ Two days International Conference- Tunnelling Asia Conference
- ✓ TAI Awards contest for in Categories
- ✓ A technical Exhibition
- ✓ Metro Jobsite Visits
- ✓ An Awards Ceremony Banquet
- ✓ An Event that runs fully in-person and Fully Virtually

Organized by



ITA  
INTERNATIONAL TUNNELLING  
AND UNDERGROUND SPACE  
ASSOCIATION



ITA TUNNELLING  
AWARDS 2023



## INVITATION



Greetings from TAI, New Delhi !

Tunnelling Asia' 2023, the biennial conference is being organized by Tunnelling Association of India (TAI), Delhi Metro Rail Corporation Ltd. and Mumbai Metro Rail Corporation Ltd. under the aegis of International Tunnelling and Underground Space Association (ITA) at Mumbai, the financial capital city of India. The conference shall provide opportunity to share knowledge, experiences, case studies, describing the real world applications for the benefit of the participants.

On behalf of the Tunnelling Association of India, I take great pleasure in extending a cordial invitation to individuals, Regulatory Bodies, Govt. Departments, Tunnel Building Contractors and Consultants, Manufacturers, Research Institutes, Universities and Funding Agencies, who are actively involved in the tunnel and underground construction and Member Nations of ITA, to participate in the exciting **Tunnelling Asia' 2023** conference and 9th Edition of ITA Award Function being held on 22-24 November 2023 at Mumbai.

Since many underground structures are either under construction or being planned in this country, there is vast scope for Global and national concerned agencies, to benifitted from the conference and exhibition.

We look forward to welcoming you in Mumbai, and hope that your stay and experience here will be a memorable one.

**(Dr. Mangu Singh)**

*President*

Tunnelling Association of India &  
*Principal Chief Advisor*  
Delhi Metro Rail Corporation Ltd.

## MESSAGE



### **THE ITA TUNNELLING AWARDS UP FOR 2023 The 9th edition of the International Tunnelling and Underground Space Awards**

Organised by the International and Underground Space Association, this event will take place in Mumbai, India at the occasion of the Tunelling Asia Conference 2023 organized by the Tunnelling Association of India (TAI)

Since 2015, this international competition seeks and rewards remarkable achievements in tunnelling and the underground industry. The events both showcases the most ambitions underground projects all over the world as well as the latest innovations, techniques, and methods in tunnelling.

Arnold Dix, President of the ITA, praised the quality of the award-winning projects, underlining that "The Tunnelling Awards is a celebration of the great milestones and the great innovations achieved. It also highlights the contributions from almost 20 countries have been considered by a panel of independently select judges. The Ceremony today rewards the through to the latest innovations and productions. These amazing achievements can be enjoyed today".

**(Arnold Dix)**

*President*

International Tunnelling & Underground Space Association ( ITA)



## INVITATION



The growth of infrastructure sector is the key indicator of the economic growth. Underground facilities have a very important role to play in metro cities and other State Capitals in India.

Tunnels are playing an important role in infrastructure development in different sectors such as metro rails, railways, highways, water supply and sewerage disposal, hydropower and transfer of water for irrigation.

Tunnelling for metro works is fast developing in the country. In the city of Mumbai, many underground activities are at presently going on for metro, water supply, highways and coastal projects. The Mumbai city will see such a big scale infrastructure intervention, spanning 33.5 km for Mumbai Metro Line 3, Surya Regional water supply scheme (7.0 km) and Mumbai Coastal road project, 7.7 km with lot of geotechnical and construction challenges. We have to keep ourselves abreast with the latest in this field of tunnel technology. Lot of advancements

have been taken place in tunnel technology and underground space engineering, the large size tunnel boring machines are only one example of such advances and progress. Other areas of underground engineering have become highly sophisticated over the recent years. There will be a good opportunity to the professionals to share their knowledge, experiences besides the case studies describing the real world applications for the benefit of the participants and for the industry to continue on path of evolution. Since many underground projects are being executed in the city of Mumbai, there is vast scope for tunnel and underground industry to participate in the aforesaid construction works and this conference would provide them an excellent opportunity to come in the fore front by taking part in the table top exhibition where they can demonstrate their capability either in providing services or equipment.

On behalf of the Mumbai Metro Rail Corporation Limited and Chairman of the Organizing Committee, I take great pleasure in extending a cordial invitation to professionals, (Planners, and Decision Makers Designers, Geologist), Metro authorities, Insurance agencies and Regulatory Bodies, Govt. Departments, Tunnel Building Contractors, Consultants, Manufacturers, Technical Research Institutes, Universities and Funding donor Agencies, who are actively involved in the tunnel and underground construction, to participate in the Tunnelling Asia 2023 conference on the theme " Climate Resilience and Sustainability in Tunnelling and Underground Space on 22-24<sup>th</sup> November 2023 at Mumbai.

I look forward to welcoming you in Mumbai, and hope that interaction on the different aspects of tunnelling during the two day deliberations will be a memorable one and shall be highly beneficial to all those associated with tunnelling industry.

**(Ashwini Bhide, IAS)**

*Managing Director*

Mumbai Metro Rail Corporation Limited &  
Chairman of the Organizing Committee

---

## Introduction

The decade 2021-2030 is a pivotal one for the future of our global infrastructures. Almost every countries approved special laws to release exceptional funding for the modernization and expansion of public infrastructure, but such unprecedented action is coinciding with an impressive global effort to transform the way we design and build to contribute towards zero emissions by 2050. It is undeniable their is impact of the 'Conference of Parties' (COP) summits, which have been bringing together world leaders, to discuss action on climate change for almost three decades, peaking in 2021 with COP26 in Glasgow The direct consequence of these activities on the daily business for the tunnelling industry is clearly visible.

Rising urbanization continues to increase land values, at the very time when more and larger public spaces are needed. If more than 50% of the planet's population already lives in cities, an estimated 61% will be urbanized by 2030 and 70% by 2050 as confirmed during the Workshop of the Working-Group 20 of the International Tunnelling and Underground Space Association (ITA-AITES). The answer to this increase in demand for space and natural resources, as well as to reduce the growing waste, is through underground construction and underground space expansion, creating new opportunities and approaches to sustainability to address those realities. Potential economic, environmental, and social impacts of tunnels and underground space are immense—with proper planning and development of underground space promising an enhanced quality of life.

As we navigate through very challenging times, news on climate change and the pandemic is balanced out by hope for the future. Thanks to new policies and investments, introducing sustainability parameters, evaluation alternative design options for new infrastructures is essential, particularly in our rapidly growing cities. An intrinsic component of this parameter is urban resilience, which should be managed properly by taking advantage of underground spaces. Hurricanes, earthquakes, typhoons, heavy rainfall, heat waves, rising sea levels are only some of the examples of new scenarios to be included in the resiliency verification as part of a new infrastructure planning.

The Tunnelling Asia conference has been supported in different years by the ITA-International Tunnelling and Underground Space Association, Delhi Metro Rail Corporation, Mumbai Metro Rail Corporations and other tunnelling Industries, Directorate General of Border Road Organisation, NCRTC, NHIDCL, NHAI, NHSRC, Ministry of Railway, MORTH, Universities, and other public institutions. The conference is a scientific and technical event where municipalities, public institution representatives, contractor companies, machinery-equipment manufacturers, and engineers come together, to discuss scientific and technological developments and issues related to sustainable underground tunnelling.

## TOPICS

The following topics will be deliberated during the conference :

### 1. Sustainability in underground - Planning, design, construction and operation of tunnel and underground projects

- Role of stakeholders to achieve sustainability – from planning to execution in underground space utilisation for sustainable development in fragile ecologies like hilly areas.
- Urban underground space utilisation for multiple urban requirements and infrastructure for sustainable cities
- Sustainable design practices that occur with tunnelling procedures, like the increased life expectancy of the tunnel – as compared to surface treatments – and even the reduced energy consumption via use of local material delivery, reuse and disposal.
- Finding a sustainable balance between investment cost, design options and impact on the environment (e.g. slopes) including subsequent maintenance, repair and downtime cost.
- Construction equipment and machinery – sustainable life cycle and re-use / refurbishment of equipment (parts) of major tunnelling machineries
- Controlled consumption of materials and natural resources Such as reduced consumption of cement in design mix
- Risk sharing for use of alternative materials and methods to improve sustainability – contractual coverage of alternative specifications
- Sustainable sprayed concrete lining (SCL) and sprayed waterproofing membrane technology

### 2. Climate change resilience and Adaptation measures

- Climate change adaptation needs and measures to upkeep ageing infrastructure
- Environmental and Socio economic impacts of the tunnelling process, including energy consumption, materials and resources and site disturbance.
  - Technical codes and regulations need to be updated to specify and adopt technological innovations and to create legal frameworks for competitive procurement methods;
  - customer demand circularity needs to be implemented by lowering demand for primary resources through design and process optimization, including re-use of materials;
  - construction and materials decarbonization need to be supported by fiscal policies and incentives to shift to alternatives that are more energy efficient.
- Specific framework needs and key action areas in order to improve the sustainability of underground projects:
  - Design for flexibility of the underground spaces;
  - Foster materials innovation and re-utilization;
  - Standardization and industrialization of processes;
  - Equipment optimization and re-cycling;
  - Improve resilience towards climate change and future pandemics, thus reducing cost / carbon for reconstruction.

### 3. Risk Management, Contracts and Financial Aspects

- Sustainability and green contracting
- Contractual practices and the FIDIC Emerald Book
- Costing and contractual practices in Tunnel and Underground Works including aspects of Measurements and Payment;
- Risk analysis and sharing and Decision-making in Tunnel and underground projects
- Contractual incentives for optimised resource usage
- Operational Health and Safety-increased commitment of stakeholders in tunnelling industry and to suggest penal provisions for non-adherence
- Insurer's perspective including environmental impact
- Experience and Structure of Model Contract Document for EPC tunnel projects;
- Contractual frame work and policies in different countries, including experiences in regard to claims and disputes

### 4. Ventilation, Lighting and Fire Safety in Tunnels

- Sustainable dimensioning of Tunnel ventilation systems
- Overall Fire Safety arrangement in transport tunnels - Detection & Suppression
- Behaviour and system aspects of tunnel fires and evacuations
- Lighting, LED technology, signalling or acoustic e.g. routing, on-board units

## INDUSTRY SPECIAL ASPECTS

Following Tunnel and Underground special aspects will also be covered in the special session on industries aspects by the sponsor organisations during the conference

## EXCAVATION

### 1. Mechanised Tunnelling Equipment

Tunnel Boring Machines : Case Histories for tunnelling in Urban areas and Himalayas

### Rock Mechanics to Drill and Blast

- Road headers : Use of road header in tunnel and underground construction
- Innovation in Concrete Pumps, Formwork, Ventilation Fan and Instruments for Underground Construction
- Materials : Innovation in materials, segments and shotcrete
- Waterproofing: Modern Approaches to Tunnel Water Proofing

## CALL FOR PAPERS

Technical Papers reflecting the developments in design, construction, innovative methodology, technology, materials, instrumentation, including case histories of climate resilience and sustainability in tunnel and underground space issues and solutions, relevant to the Themes and Topics are invited for presentation in the technical sessions. Full papers, including main body, figures, and tables, should not be more than 10 pages on the A4 format; Guidelines to Authors published on the TAI website ([www.tai.org.in](http://www.tai.org.in)) may be referred to for more details on formatting. All the papers received will be reviewed by a panel of experts for the quality of contents and their relevance to the themes of the Sessions and compliance with the Guidelines before acceptance. Authors of accepted papers will be requested to submit presentation slides. Authors of papers not included for oral presentation, may make a poster presentation of their papers.

Only original contributions that have not been published or presented at any other conference/symposium/seminar are acceptable, otherwise the paper will not be considered. The full length paper will be reviewed by the Technical Committee for oral and poster presentation during the conference. Soft copies of all the accepted papers will be distributed to the participants during the Conference. TAI reserve the right to publish the technical papers on their websites or in any other media; therefore, consent in this regard shall be given by the Principal Author while uploading the paper.

## GUIDELINES FOR PREPARATION OF PAPERS/CASE STUDIES

Please refer Website : [http:// www.tai.org.in](http://www.tai.org.in)

## SCHEDULE

The timeline for submission and acceptance of papers is as follows:

- Full papers: 31st August, 2023
- Communication of accepted papers: 30th September, 2023
- Communication of papers selected for oral presentation: 20th October 2023
- Submission of Power Point slides (limited to 15) for oral presentation: 31st October 2023

## WHO SHOULD ATTEND?

The conference will be of interest to Tunnel Designer & Operators, Engineers, Geologists, Regulatory Bodies, Government Departments, Tunnel Building Contractors & Consultants, Suppliers of Products & Services for Tunnelling Construction, Fire Authorities dealing with Infrastructure Tunnels, Technical and Research Institutes, Universities dealing with Tunnelling, Organization & Associations active in the Tunnelling World Instruments manufactures and Funding Agencies.

## OFFICIAL LANGUAGE

The official language of the Conference is English.

## REGISTRATION FEE

The registration fee payable by the delegates, including authors of papers, for participation in the **Tunneling Asia Conference** is as follows:

Countries	India	Other Countries
Delegate/ Author	Rs. 20,000* (225 € / 265€)	US\$ 700* (650€ / 770€)
Research Student	Rs. 10,000* (113 € / 133€)	US\$ 350* (325€ / 385€)
Accompanying Person	Rs. 10,000* (113 € / 133€)	US\$ 350* (325€ / 385€)
<b>Awards Conference</b>	Rs. 20,000*	€ 350
Awards Dinner	Rs. 20,000*	€ 350
Awards Conference + Dinner	Rs. 35,000*	€ 600
TA & Awards Conference	Rs. 35,000*	€ 850
TA + Awards Dinner	Rs. 35,000*	€ 850
TA & Awards Conference + Awards dinner (TA ; Tunnelling Asia Conference)	Rs. 50,000*	€ 1050

\* GST extra @ 18% when applies

**GST No. : 07AAAAA8324J2ZT.**

# AWARDS



*9th Edition*

## ITA TUNNELLING AWARDS 2023

24<sup>th</sup> November 2023

### 9th EDITION OF THE ITA TUNNELLING AWARDS

Organised by the International and Underground Space Association, this event will take place in Mumbai, India on the occasion of the Tunnelling Asia Conference 2023 being organized by the Tunnelling Association of India (TAI). Since 2015, this international competition seeks and rewards remarkable achievements in tunnelling and the underground industry. The event showcases both the most ambitious underground projects all over the world as well as the latest innovations, techniques, and methods in tunnelling.

Arnold Dix, President of the ITA, praised the quality of the award-winning projects, underlining that “The Tunnelling Awards is a celebration of the great milestones and the great innovations achieved. It also highlights the contributions made to our planet and people. Last year, 70 nominations from almost 20 countries have been considered by a panel of independently selected judges. The ceremony rewards the best in our industry, from the largest projects on earth right through to the latest innovations and productions. These amazing achievements can be enjoyed today”.

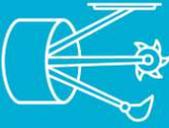
### Call for entries

This year the Entries can be submitted in 8 categories:

- ✓ Major Project of the Year - over €500M
- ✓ Project of the Year - between €50 and €500M
- ✓ Project of the Year including Renovation - up to €50M
- ✓ Technical Innovation of the Year
- ✓ Beyond Engineering
- ✓ Product/Equipment Innovation of the Year
- ✓ Innovative Underground Space Use
- ✓ Young Tunneller of the Year

**Registration for application until 10 July 2023.**

## PARTICIPATE

<p><b>MAJOR PROJECT OF THE YEAR</b></p> <p>+500 M€</p> <p>SEE DETAILS</p>	<p><b>PROJECT OF THE YEAR</b></p> <p>50 / 500 M€</p> <p>SEE DETAILS</p>	<p><b>PROJECT incl. RENOVATION OF THE YEAR</b></p> <p>-50 M€</p> <p>SEE DETAILS</p>	<p><b>TECHNICAL INNOVATION OF THE YEAR</b></p>  <p>SEE DETAILS</p>
<p><b>BEYOND ENGINEERING</b> MAKING UNDERGROUND WORKS PROJECTS EVEN BETTER</p>  <p>SEE DETAILS</p>	<p><b>PRODUCT/EQUIPMENT INNOVATION OF THE YEAR</b></p>  <p>SEE DETAILS</p>	<p><b>INNOVATIVE UNDERGROUND SPACE USE</b></p>  <p>SEE DETAILS</p>	<p><b>YOUNG TUNNELLER OF THE YEAR</b></p>  <p>35</p> <p>SEE DETAILS</p>



**4th Edition**

# TAI TUNNELLING AWARDS 2023

**22<sup>nd</sup> November 2023**

## 4th EDITION OF THE TAI TUNNELLING AWARDS

Organised by the Tunnelling Association of India, this event will take place in Mumbai, India at the occasion of the Tunnelling Asia Conference 2023.

Since 2017, this competition seeks and rewards remarkable achievements in tunnelling and the underground industry. The event both showcases the most ambitious underground projects in India as well as the latest innovations, techniques, and methods in tunnelling.

**Call for entries :** The Entries can be submitted in 6 categories:

- ✓ Life Time Achievement Award
- ✓ Tunnelling Project of the Year
- ✓ Technical Innovation in Tunnelling
- ✓ Safety Initiatives in Tunnelling and Underground projects
- ✓ Environmental Initiatives in Tunnelling
- ✓ Young Tunneller of the Year

**Registration for application until 30 September 2023.** Cariteria and format for submission of Award entires are given in [www.tai.org.in/tai-awards/](http://www.tai.org.in/tai-awards/)

## EXHIBITION - (22-24 November 2023)

Exhibition Booth of 2m x 2m will be provided to the sponsors organisations at the venue of the Conference. The exhibition will provide a scope to present the new technologies, materials and mechanisms including software. Participants will enjoy sufficient time and opportunity to inspect the exhibition, and exhibitors will have an excellent opportunity of accessing a large number of potential buyers/decision makers each day. This opportunity will be allotted on first-cum-first served basis.

The Charges for one Booth will be Rs. 3.00 lacs + GST.

## ADVERTISEMENT OPPORTUNITIES

A limited space will be made available on first-come-first-served basis, for coloured advertisement to the organizations, involved in the concerned field, in the proceedings volume of the Conference. The interested organizations are required to send the CD of the advertisement material in Corel Draw software or in PDF format, in A4 size along with payments as detailed below:

**Inner Pages 2<sup>nd</sup> & 3<sup>rd</sup> Cover**

INR 30,000\* INR 50,000\*

\* GST @ 18%. GST No. : 07AAAAA8324J2ZT

## SPONSORSHIP OPPORTUNITIES

The Conference will provide an excellent opportunity to national and international organizations; central / state government organizations, public sector undertakings, industrial organizations, equipment manufacturers, entrepreneurs, financial and funding institutions, consulting and construction organizations to publicize themselves by being Platinum / Golden / Silver sponsors or Supporter of the Conference. The sponsorship fees payable and benefits are mentioned on the last page. Interested organizations may communicate their willingness to the Conference Secretariat.

## PAYMENT

All payments are to be made by the following methods:

The fee can be paid by cheque to be drawn in favour of "Adhering Committee of International Tunnelling Association (India)" or by bank transfer to the following account:

### Beneficiary Details

- Name of Bank: Canara Bank, Delhi Diplomatic Enclave, 7/48, Malcha Marg, Chanakyapuri, New Delhi 110021
- Account No. **0157101031496** MICR Code No. **110015007** Account Holder Name: "**ADHERING COMM OF ITA**"
- IFSC Code: **CNRB0000157** Swift Code: **CNRBINBDFS**

Bank charges if any, must be borne by the organisation/participants and should not be deducted from the amount remitted to the Conference Secretariat.

## CONFERENCE SECRETARIAT

Secretary General, Tunnelling Association of India  
Plot No. 4, Institutional Area, Malcha Marg, Chanakyapuri New Delhi - 110 021, India  
Phone: 91-11-2611 5984/ 2611 6567 Ext.113; Fax: 91-11-2611 6347  
Contact Person: **Mr. Sunil Sharma** (Advisor) Mobile: 91-9811299136  
Email: [sunilsharma235@gmail.com](mailto:sunilsharma235@gmail.com); [contact@tai.org.in](mailto:contact@tai.org.in)  
Website: [http:// www.tai.org.in](http://www.tai.org.in)

## SPONSORING / ASSOCIATES PACKAGES

ITEM For Platinum / Gold Packages (15% discount for ITA Prime Sponsors) except on TA only	PLATINUM	Platinum Digital	GOLD	Gold Dinner	Gold Digital	SILVER	Silver Digital	SILVER Conference BAGS	BRONZE NAME BADGES	BRONZE LANYARD	SUPPORTER SPONSOR	BOOTH	Advertisement Documents
Logo on all Awards communication (web, flyer, final program) 2 pages of advertisement in the TAI Conference Program & Logo on the Asia Conference 's Backdrop													
Logo on all Awards communication (web, flyer, final program) 1 page advertisement in the TAI Conference Program & logo on the Asia Conference's Backdrop													
Logo on all Awards communication (web, flyer, final program) Half page advertisement in the TAI Conference Program & Logo on the Asia conference backdrop													
3 Awards conference and banquet registrations and 25% discount for other participants from the company. 15 full conference registrations for TAI Conference													
2 Awards conference and banquet registrations and 15% discount for other participants from the company. 6 full conference registrations for TAI Conference													
1 Awards full registration & 15% discount for other participants from the company. 4 full conference registration TAI Conference													
15% discount for Awards conference and banquet registration. 2 full conference registration TAI Conference													
A 3 min company presentation during the Awards conference A 15 min company presentation during the TAI Conference													
A 3 min company presentation during the Awards dinner. A 10 min company presentation during the TAI Conference													
Inclusion of a A4 (max 8 pages) document of your choice (provided by you) in the conference bag Distribution of Catalogues													
Inclusion of a A4 (max 4 pages) document of your choice (provided by you) in the conference bag Distribution of Catalogues													
Free Booth during the awards conference (2x2mX2m) during TAI Conference													
Free Booth during the awards conference (1x2mX2m) during TAI Conference													
Roll-ups in the Awards lunchroom Display name during TAI Conference lunch hours													
Logo on the Awards Conference Bags Logo on the Asia Conference 's Backdrop													
Logo on Awards Name Badges Logo on the Asia Conference 's Backdrop													
Logo on Awards Lanyards Logo on the Asia Conference 's Backdrop													
Exhibition stall 2mX2m 3 Spot Light, 2 chairs, 1 table, 1 electric Supply Power Plug, Carpet & Dust bin													
Display name during Tunneling Asia Dinner hours													
Logo in the inner flap of the Kit of the TAI Conference													
Advertisement 3rd cover page in TAI conference programme													INR 50,000 +18%
Advertisement 2ndcover page in TAI conference programme													INR 30,000 +18%
<b>Virtual Platform</b>													
Logo on virtual lobby													
Logo on virtual auditorium													
3 min company presentation available in the Lobby													
One virtual booth (T2 # Double booth)*													
One virtual booth (T1 # Single booth)** document in ebag / price per document													150 €
<b>Awards / Awards + TAI / TAI Conference</b>													
<b>A</b>	15000 €		10000 €			8000 €			3000 €	3000 €	4000 €	2500 €	
<b>A + T</b>	25000 €	15000 €	15000 €		9000 €	10000 €	6000 €	10000 €	4500 €	4500 €		5500 €	
<b>T</b>	13000€/ 10.00lacs		6500€/5.00 lacs	6500€/5.00 lacs		4100€/3.00 lacs			2700€/2.00 lacs	2700€/2.00 lacs		4100€/3.00 lacs	

\*(T2 # Double booth) including Company Logo / Email Link / Chat Button Link / Website Link / Up to 150 word description of your organization + an additional contacts information document that can be downloaded / Branded booth at your colour (need to send the one pantone colour you want) / Document Library Image 1 (Portrait) 1 (Landscape) videos (up to 3), docs (up to 4)

\*\*Booth will be customized to your corporate identity, (T1 # Single booth) including docs (up to 4)

**We appreciate your contact in case you have any specific requests or if you would like to include promotional items in the conference bag.**