

The role of underground infrastructures in the achievement of the U.N. Sustainable Development Goals

The construction industry is responsible for 5-10% of an advanced nation's total emissions of Greenhouse Gases (GHG). This impact mainly arises from the embodied carbon in the primary construction materials, i.e. cement and steel. Even if western nations made significant progress in reducing emissions, a detailed analysis shows that the situation should not motivate optimism. Among the several Greenhouse Gases, carbon dioxide emissions are typically associated with products and activities, to quantify their impact in terms of the so-called "carbon footprint".

In tunnelling projects there are several sources of carbon emissions, and this conference will contribute to examine the options for reducing the carbon footprint and for spreading an innovative, sustainable and inclusive economic growth of underground industry. For example, the usual sprayed concrete lining, which consists of two of the largest contributors to the embodied carbon of a tunnel, i.e. concrete and steel reinforcement, is one of the main issue. Possible improvements are the replacement of materials or design modifications (Thomas 2021), e.g. adopting new design concepts such as permanent sprayed concrete linings, or Composite Shell Linings, incorporating spray applied waterproofing membranes, which should offer significant advantages. As expected, like every innovation, they are subjected to initial oppositions due to the limited data on their performance and the absence of established design codes.

As a first relevant contribution to the accomplishment of the U.N. Sustainable Development Goals, the Italian Tunnelling Association (SIG) has organized a two-day conference which will be opened on October 20th by a round table of the "European Underground & Tunnel Forum" (EUTF), founded in 2019 and composed by the representatives of Austria (ITA Austria), Belgium (ABTUS), France (AFTES), Germany (DAUB), Italy (SIG), Nederland (KIWI), Portugal (CPT), Spain (AETOS) and Switzerland (STS). The Round Table will be followed by Session 1, consisting of four lectures delivered by experts of tunnelling "carbon footprint". Further nine lectures will be held in Session 2 (October 21st) by experts in maintenance of existing tunnels, Tunnel Information Modelling, innovative regeneration of existing tunnels, and re-use of TBM excavated muck.

Carlo Callari
(Scientific Committee Coordinator)

Agostino Viglione
(SIG YMS Group Coordinator)

Program – October Thursday 20th

- 01:00 PM *Registration*
- 02:00 PM *Opening speeches*
SIG President **Renato Casale**
SIG YMs group Coordinators
Agostino Viglione
Luigi D'Angelo
- Session I Chairmen: **G.Lunardi, A.Nonni, P. Pierotti**
- 02:15 PM Round Table of n.9 EUTF Member Nation's Presidents
- 03:45 PM *Coffee break*
- Session II Chairmen: **A. Bortolussi, S.Fabozzi**
- 04:15 PM **A. Cornaro** (Itacus)
"How underground space developments contribute to achieving the SDGs"
- 04:35 PM **P. Guglielminetti** (PWC – Pricewaterhouse Coopers LLP)
"Closing a long-standing infrastructure gap: challenges and opportunities of implementing infrastructure investments in Italy"
- 04:55 PM **R.Galler** (ITA - CET & Montanuniversität Leoben, Austria)
"Sustainable tunnelling- possibilities based on research results"
- 05:15 PM **M.Deffayet** (CETU)
"Sustainability assessment in construction and operation of tunnels"
- 05:35 PM *Conclusion Session II*

Program – October Friday 21st

- 9:30 AM *Opening speeches*
SIG President **Renato Casale**
SIG YMs group Coordinators
Agostino Viglione, Luigi D'Angelo
- Session III Chairmen: **D. Boldini, E. Consoli**
- 09:50 AM **L. Cedrone** (ANAS)
"The predictive maintenance of existing tunnels"
- 10:10 AM **S. Susani** (TECNE), **D.Campolongo** (ASPI)
"Sustainability, innovation and energy performance improvement in the design and management of ASPI road tunnels"
- 10:30 AM **F.Iacobini, A. Pranno** (RFI)
"From the railways tunnels inspections to the structural interventions to be implemented"
- 10:50 AM **D.Martinelli** (DIATI-POLITO)
"The use of underground space as a resource for the future: examples from Finland"
- 11:10 AM *Coffee break*
- 11:40 AM **P.Sattamino** (Harpaceas)
"Bim based digitalization platform for a smart existing tunnel assessment approach"
- 12:00 AM **S.Guanziroli** (HINFRA)
"New boundaries of digital concrete for the regeneration of existing tunnels: the ETLR technology"
- 12:20 PM **N.Valiante** (Webuild) & **D.Sebastiani** (GEEG/uniroma1)
"The management of the circular reuse of excavated soils and rocks from mechanized tunnelling"
- 12:40 PM **G.K.Pini, E. Gugiatti** (CP Technology)
"From waste to reuse: the second life of plastic in tunnel construction"
- 01:00 PM **P. Mazzalai** (Systra SWS)
"The future of the subway"
- 01:20 PM *Conclusions by C. Callari*
(Scientific Committee Coordinator)
- 01:45 PM *Lunch*

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REGISTRATION CAN ALSO BE MADE DIRECTLY AT THE CONFERENCE within
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Registration: the registration form must be received within **the 13th October 2022**

Any cancellations, which allows a 50% reimbursement, must be received no later than the 13th October 2022

Registration fee (including VAT not shown):

SIG member	payment by <u>20.09.2022</u>	€ 130,00
SIG non- member	payment by <u>20.09.2022</u>	€ 150,00
SIG YM e Junior	payment by <u>20.09.2022</u>	€ 80,00
Students	payment by <u>20.09.2022</u>	€ 40,00

Member/non member <u>after 20.09.2022</u>	€ 170,00
Member YM and Junior	€ 100,00
Students	€ 40,00

The registration fee includes: Entrance invitation to the conference, coffee-breaks, lunch

SIG member who have not paid the annual membership fees will not be eligible for the reduced fees

Payment methods:

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Conference

on

“The role of underground infrastructures in the achievement of the U.N. Sustainable Development Goals”

October 20 – 21, 2022

(translation ita/eng-eng/ita)

Verranno concessi N. 3 CFP per la giornata del 20 ottobre e N 3 CFP per la giornata del 21 ottobre dal Consiglio Nazionale degli Ingegneri

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