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**THINK DEEP CONTINUED
TOWARDS AN URBAN UNDERGROUND FUTURE**

Antonia Cornaro – Vice Chair



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TOWARDS AN URBAN UNDERGROUND FUTURE**

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Text as spoken by Antonia Cornaro, Vice Chair of ITACUS, before the 43rd ITA General Assembly, on 14 June 2017 in Bergen, Norway.

Mr President, members of the General Assembly, members of the Executive Council, Ladies and Gentlemen

Today I stand before you as vice-chair of ITACUS to replace Han, who had the sad duty to bury his mother yesterday. He has told me that in spirit he will be with us and the words I speak to you we have jointly drafted. I hope that this report will echo his words as much as they echo mine.



In 2014 Han visited the Abu Dhabi Ascent meeting on climate change. It was a meeting that was to prepare the road to the Paris Climate Agreement. The idea was to start involvement at an early stage to make the likelihood of an agreement in Paris higher. The strategy worked and at the end of 2015, a climate agreement was reached with United Nations member nations pledging to the so-called 'Intended Nationally Determined Contributions'.



During the General Assembly in Iguazu in 2014, Han shared the following with you: *“The former vice president of the United States, Al Gore, gave one of the keynotes. That presentation I can tell you grabbed everyone by the throat. Three things stood out for me during that event. The first was that no longer is there any doubt as to the fact that climate change is changing our world and that it is being caused by human activity. The second was that the costs of not doing anything are now outweighing the costs of doing something. The third is that governments alone are not going to change anything and involvement of the private sector is needed. That involvement is not about individual companies, but about companies willing to act together based on a common interest and on the simple fact that if they don’t act now, it will soon be too late.”*

(...) no longer is there any doubt as to the fact that climate change is changing our world and that it is being caused by human activity.

In terms of the focus and dedication that we as an industry must give to climate change. There are two basic approaches that we need to follow. The first is to ask ourselves what as an industry we can do to reduce the carbon footprint of our projects. How can we contribute to mitigating CO₂ emissions by directly contributing to the targets each of the countries we represent has set themselves? The second is to ask ourselves how our industry can help the world adapt to the changing climate.





Ladies and gentlemen, the world is heating up and the climate is changing. Our cities are heating up worldwide and as they consist mostly of concrete and pavement, we have created urban areas that are prone to capturing heat and retaining it. The urban heat island effect is making our cities hotter and making life in those cities increasingly difficult. It is threatening the people that live in our cities, cities that keep attracting a large influx from rural areas in a way that only increases the challenge urban areas are facing. What does this mean in terms of underground space use? Well for one it might mean that cities will increasingly look at the underground space for solutions. These could lie in creating physical spaces in which a more pleasant climate can be maintained. They could lie in creating underground storage basins to retain water after freak rainfall events. They could lie in placing transport infrastructure below the surface to create more green and open spaces at the surface. Or it could lie in developments like the Transbay Centre in San Francisco that does all these three at once. Creating green spaces in our cities is vital.

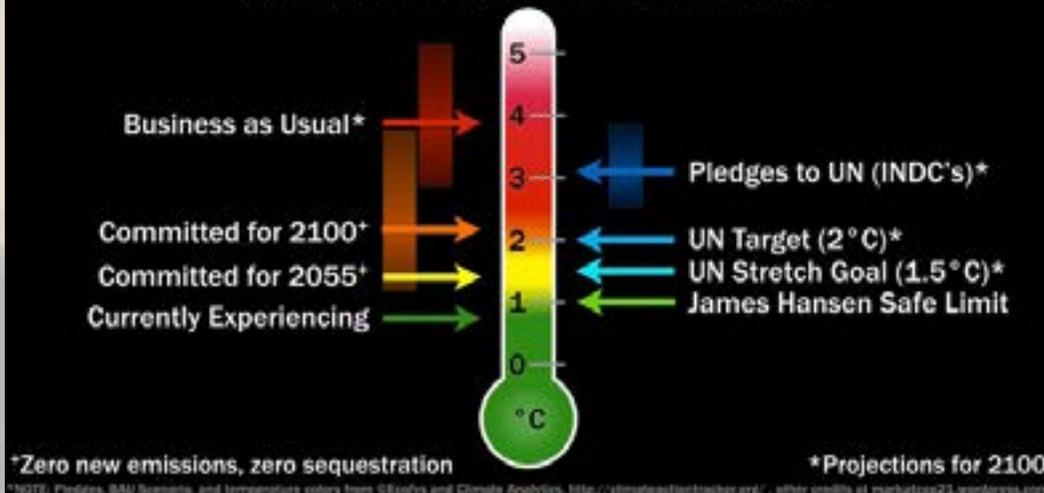
They provide benefits in terms of reducing the urban heat island effect, they capture CO₂ and they contribute to making our cities more liveable and loveable.

The key point that we are making here is that no longer should we as an industry solely proclaim the benefits of underground space. Rather we need to focus on how the use of underground space can contribute to climate change mitigation and climate change adaptation. The fact that we can build tunnels for mass rapid transport systems everyone will immediately believe. The fact that we say that by creating mass rapid transport systems below the surface we not only contribute to the mobility challenge many cities face, but at the same time free up space for more open and green areas and directly contribute to the set climate targets, will make them sit up and take notice.

Our message today is that climate change is real, it is happening, it will affect all of us. The time has come to take on this challenge and as an industry to show that we care and to know where our responsibility lies.

CLIMATE CHANGE NUMBERS FOR COP21 IN PARIS

Temperature Increases Above Pre-Industrial Levels



Let's look at the facts. There is clear evidence that our planet is heating up and that the freak weather events we see all over our planet are linked to this. We do not want the planet to warm more than 2°C on average. If it would heat up to 4°C on average we reach a so-called tipping point. That is the point where the models stop, where no one can predict with certainty what would happen. The World Bank has stated that it is doubtful that humanity would survive such an event. So, the margins are very small. Where do we stand now? As you can see from the graph if we continue with business as usual, we will pass that tipping point. If we look at all the pledges that have been made in Paris, we will stay below it, but only marginally and still well above the 2°C we were aiming for. The goal still is to aim for 1.5°C. A goal that is more and more becoming impossible, as each day that we do nothing makes it less likely we will meet that target. The latest figures from NASA show that the northern hemisphere last year was on average 1.2°C warmer.

I put it to you that this means we are not doing enough. As an industry we might be getting our focus wrong. If we are not careful we will be overtaken left, right and centre by other industries.

To give you an example. The petrochemical industry is investing large sums of money to reduce and stop use of non-renewable sources for their processes. Hydrogen is the new way forward, rather than natural gas. They are looking at capturing carbon and using that as primary source. It calls for large-scale pipeline networks. And guess where these networks need to go? Exactly, underground. Renewable energy is high on the agenda, geothermal applications but also aquifer-heat-storage are being utilised as I speak. All this is placing an enormous pressure on the underground spaces and the lack of planning and management will create a chaos below the surface.

This is where the true task of ITACUS lies, we are beyond creating awareness and interest, it is now our task to see that the subsurface becomes part of urban planning and that an active management of underground space is developed.

GLASGOW, SCOTLAND, UK – YPTDP WORKSHOP 1



For it is these professionals that together can determine what the future of underground space is and how it can create the cities we need.

ITACUS feels it is key to involve young professionals in what we are trying to achieve. This is what our Young Professional's Think Deep Programme aims for, not just to involve young engineers, but also young urban planners, urban designers, architects and geologists. For it is these professionals that together can determine what the future of underground space is and how it can create the cities we need. Cities that are resilient, sustainable, inclusive, liveable and above all loveable. Cities that both mitigate and adapt to climate change.

Two YP workshops have been held up to now. One in Glasgow in October 2016, and one in Wroclaw, Poland, just last month. The aim of these workshops is not just to provide the host city with new ideas. They are there to inspire future professionals to work together across disciplinary boundaries. That is the only way forward, not just to understand the complexity of the subsurface but also to accelerate development.

ITACUS aims at learning from these workshops and develop methodologies that can be used by cities worldwide. We hope to release a new publication with our partner ISOCARP, the International Society of City and Regional Planners by 2018.



ISOCARP
Knowledge for better Cities



We have said it before in this General Assembly, but core to what we are trying to achieve, is the ability of Member Nations to start up an urban underground space conversation at the national level. National Think Deep groups can be formed as part of the ITACUS National Actions Programme. In France COMES is active within AFTES and we like to think of them as Think Deep France. In the UK, Think Deep UK was launched and is preparing national workshops related to the use of underground space. What makes these groups unique is the membership. The professionals that join these groups range from engineers to architects to lawyers. Cross disciplined and with a focus on the subsurface and how it can be integrated into urban planning and urban development. In Sweden, Think Deep Sweden is being prepared. We look forward to working together with you and hope more and more Member Nations will join our National Actions Programme. ITACUS will help and guide you in this.

In the UK, Think Deep UK was launched and is preparing national workshops related to the use of underground space.

ITACUS will continue to serve ITA. Those words are usually spoken by Han at the end of his report. That is what we as a committee are for. To serve ITA and the industry. But we see our role also to activate the industry and to link global developments to industry opportunities. From this point of view, we welcome the Swiss initiative to set up SCAUT – the Swiss Centre for Applied Underground Technologies. SCAUT is a cross industry initiative that aims at researching and developing new technologies that support the use of underground space. As ITACUS we support this initiative and will actively engage with SCAUT in developing their research programme based on the challenges of today.

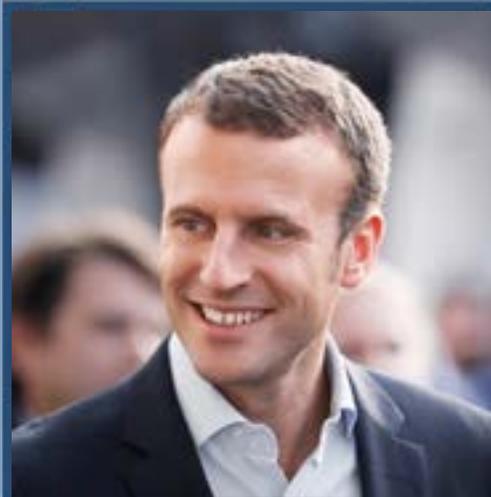




Ladies and gentlemen, the world is changing rapidly, we need to adapt, not just to the challenges of climate change but also in terms of the many disruptions our industry faces. ITACUS was recently at the Hyperloop Vision for Europe event in Amsterdam. Hyperloop is an example of a major disruptor challenging the way we transport ourselves. It doesn't end there, the internet itself has proven a major disruptor and the need for data storage facilities rises each day. Elon Musk is challenging the industry in that he wants to build his own tunnel boring machines. Each challenge brings new opportunities and as an industry we need to embrace them. Only in this way will we stay relevant, as a committee, as an association and as an industry.

The sense of urgency is such that we cannot leave it up to national governments to find solutions. Increasingly cities become empowered and bypass national governments to act on behalf of their citizens. Industry has a role to play in that sense as well. The private sector needs to work together with the public sector in finding new solutions. That is our appeal to you today. Let's accept the challenge before us and start not next week or next year, but tomorrow. In the words of the newly elected president of France, Emmanuel Macron: "*Make our planet great again*". For ITACUS this translates into "*Make our cities great again*"!

Thank you!



**MAKE OUR
PLANET
GREAT
AGAIN**

Technical session #6

Think Deep Continued Towards an Urban Underground Future

Hosted by ITACUS



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