



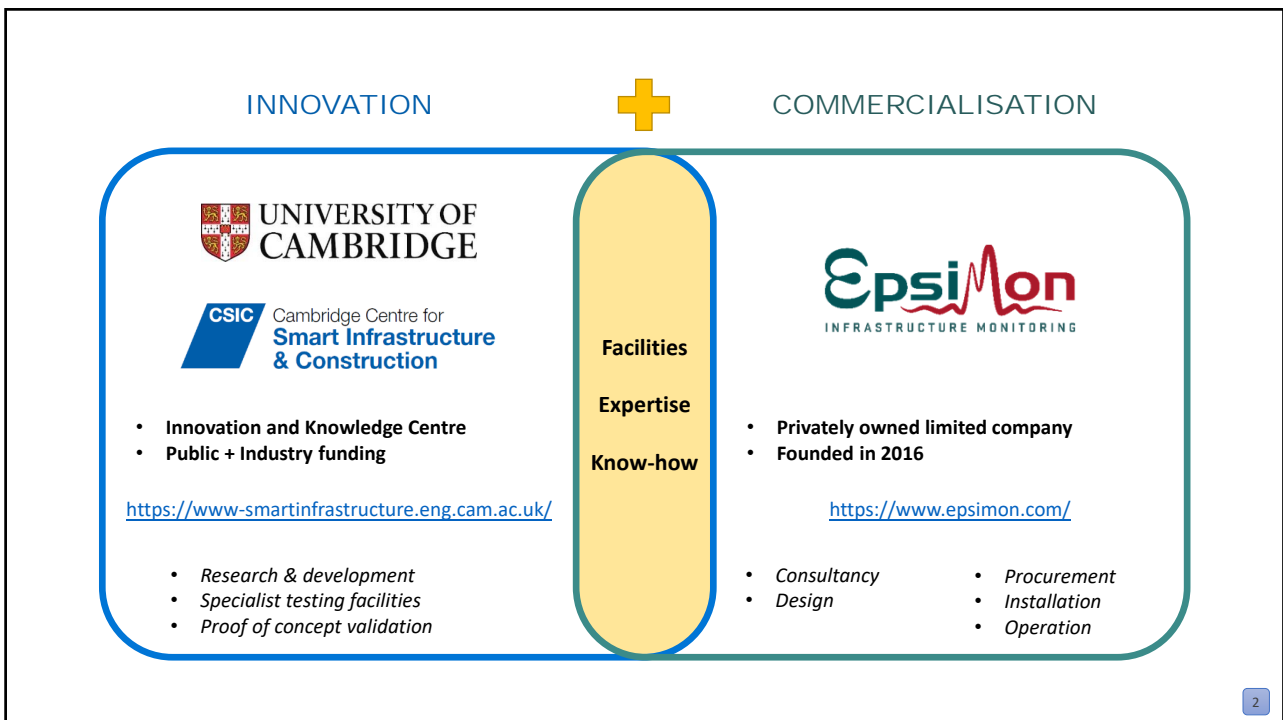
# Fibre optic instrumented geogrid for sub-surface ground movement detection

Dr **Nicky de Battista**  
*CSIC – Research Associate*  
*Epsimon – Director & co-Founder*

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EPIC Meeting on Fiber Sensors  
Porto, Portugal • 19-20 April 2023

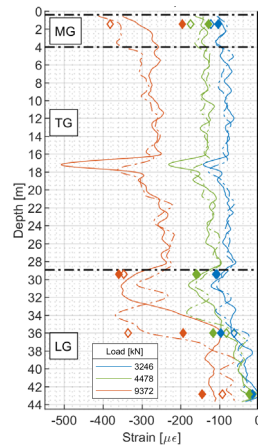
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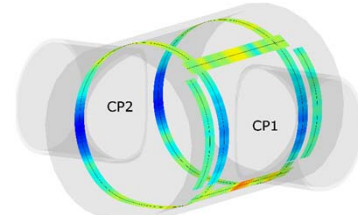
## Applications of Fibre Optic Sensing

### Underground infrastructure

Piles & diaphragm walls



Tunnels

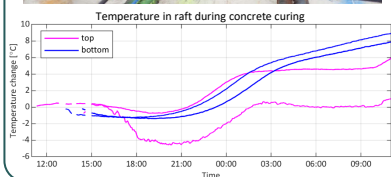


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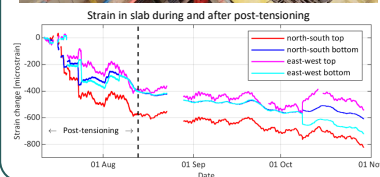
## Applications of Fibre Optic Sensing

### Building structures

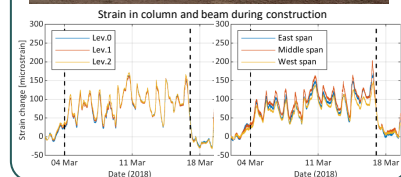
Raft foundations



Long-span slabs



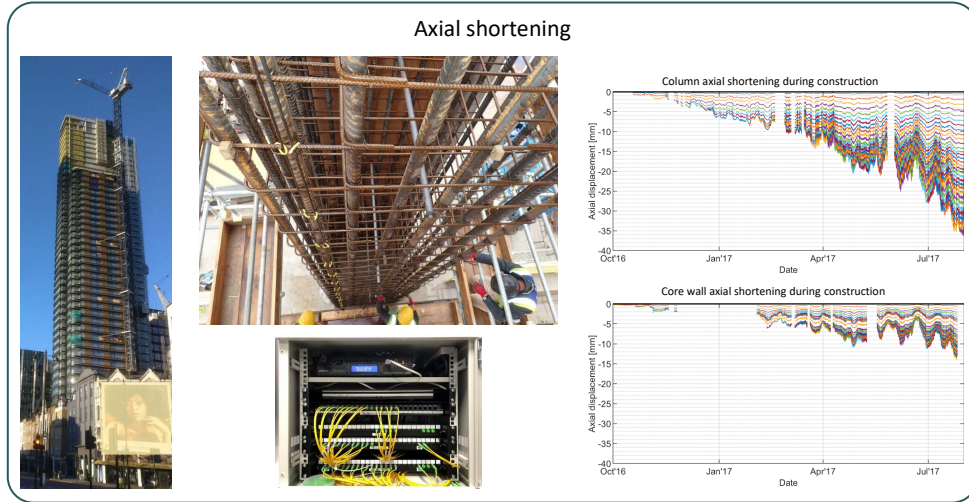
Steel & concrete frames



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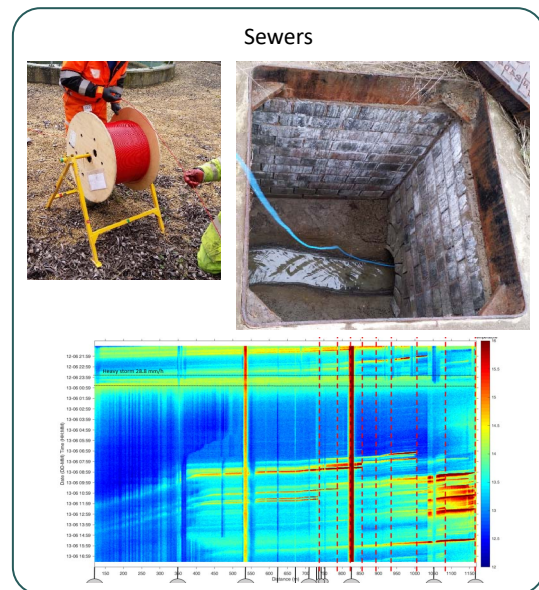
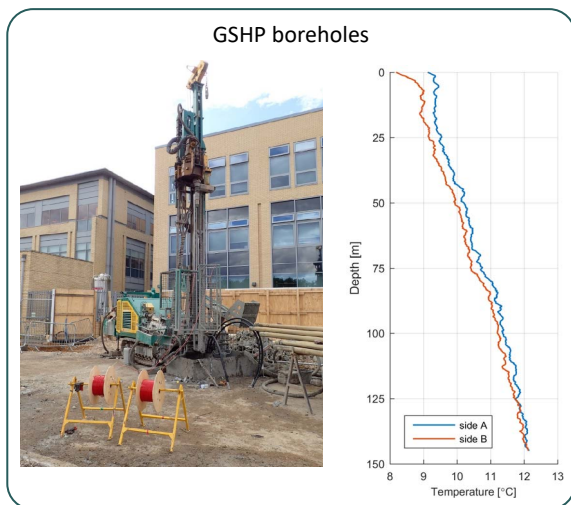
## Applications of Fibre Optic Sensing

High-rise buildings



## Applications of Fibre Optic Sensing

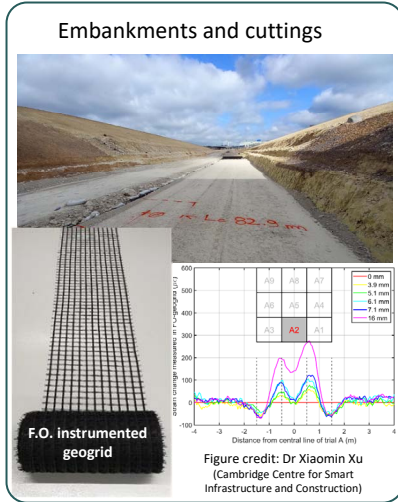
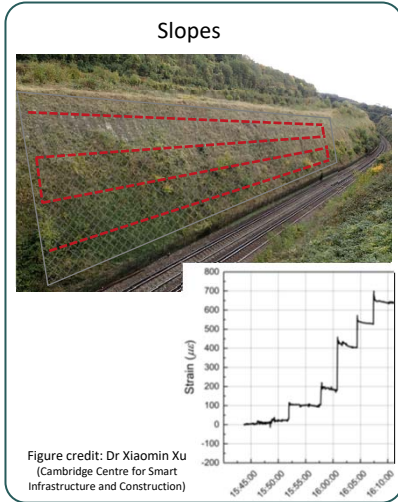
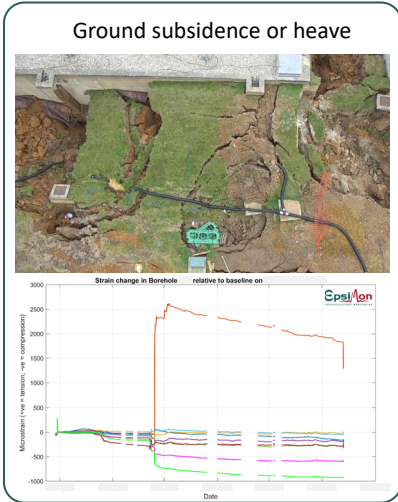
Distributed temperature sensing (DTS)





## Applications of Fibre Optic Sensing

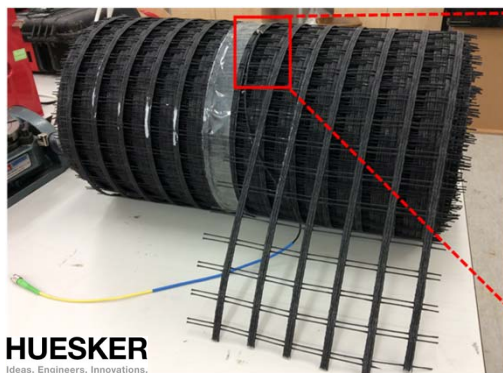
### Earthworks



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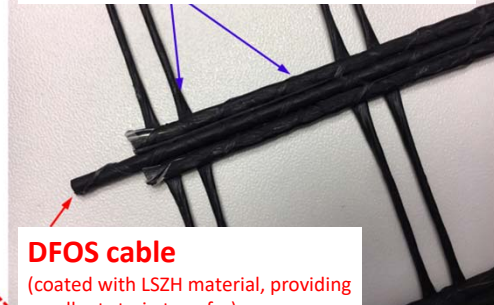
## Fibre optic instrumented geogrid

### Sensorgrid



### FortracR200/30-30MPT

(covered with a black polymeric coating, providing high strength with low creep characteristics)



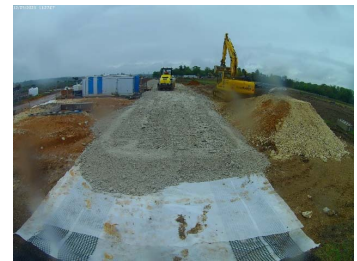
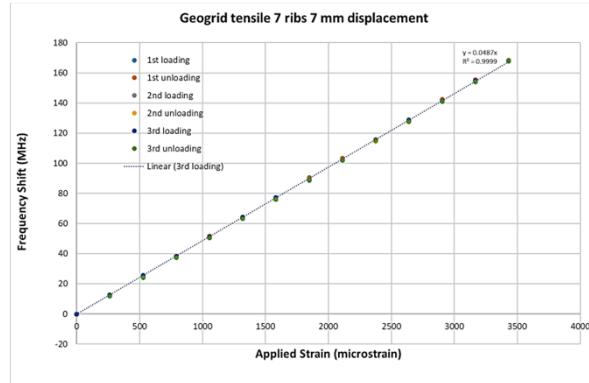
### DFOS cable

(coated with LSZH material, providing excellent strain transfer)

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### Prototype testing

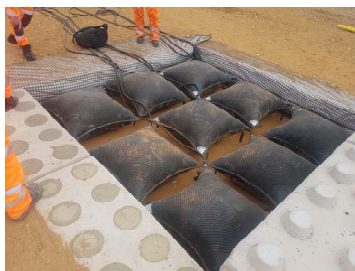
Strain characterisation and durability



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### Prototype testing

Field demonstration

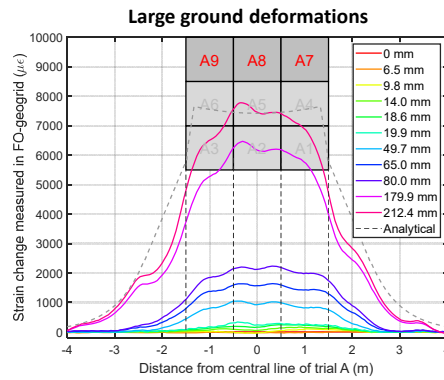
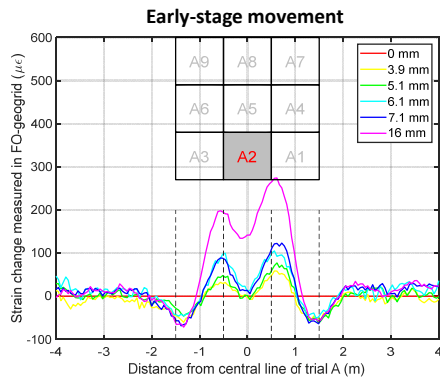


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**Prototype testing**

Field demonstration



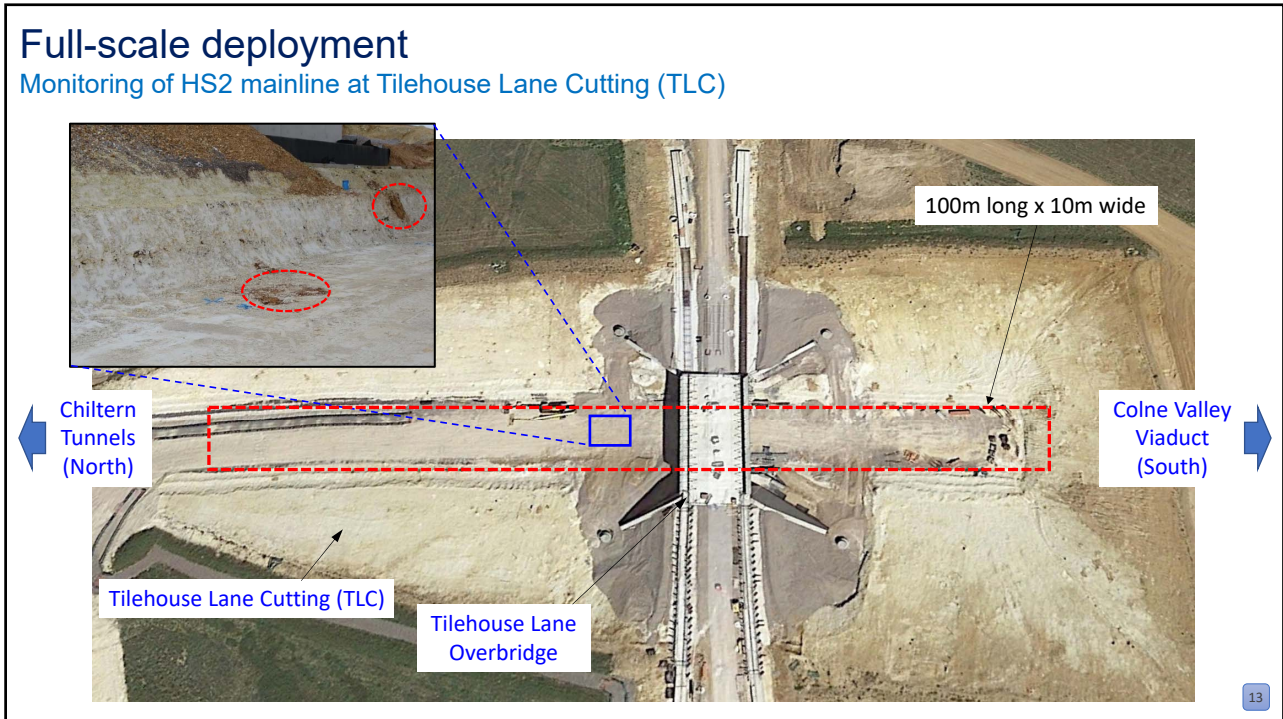
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**Full-scale deployment**

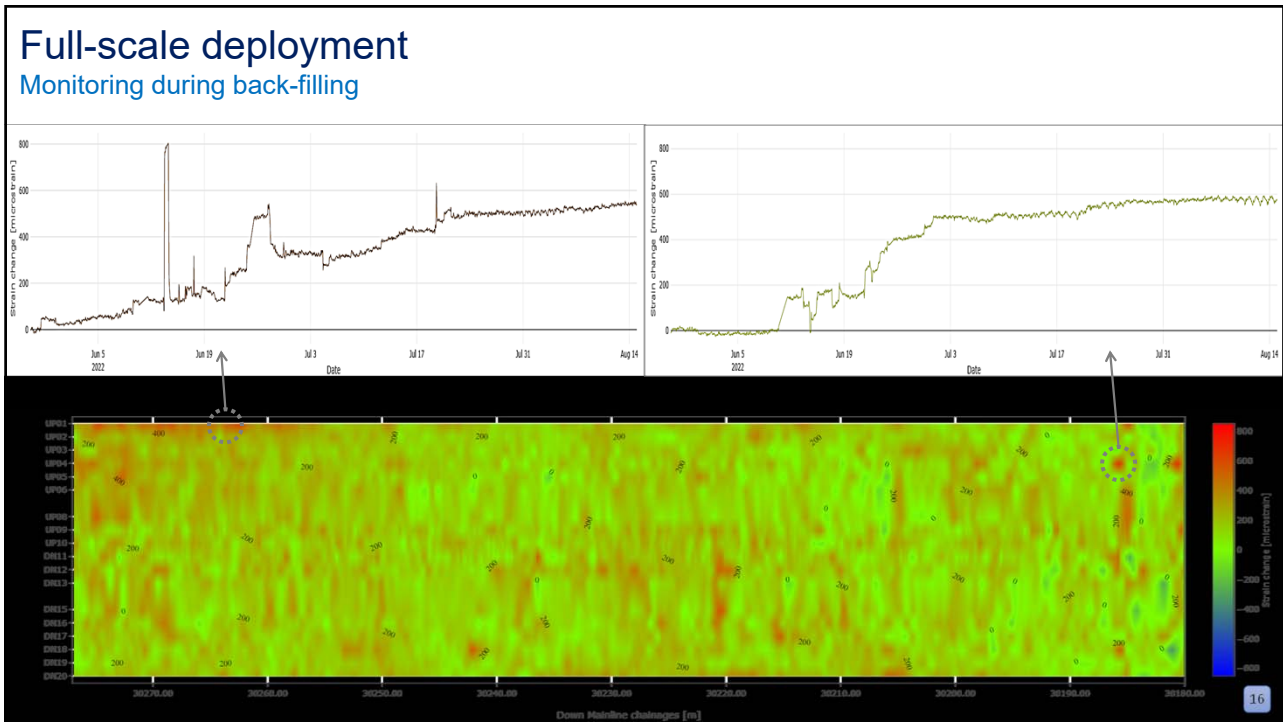
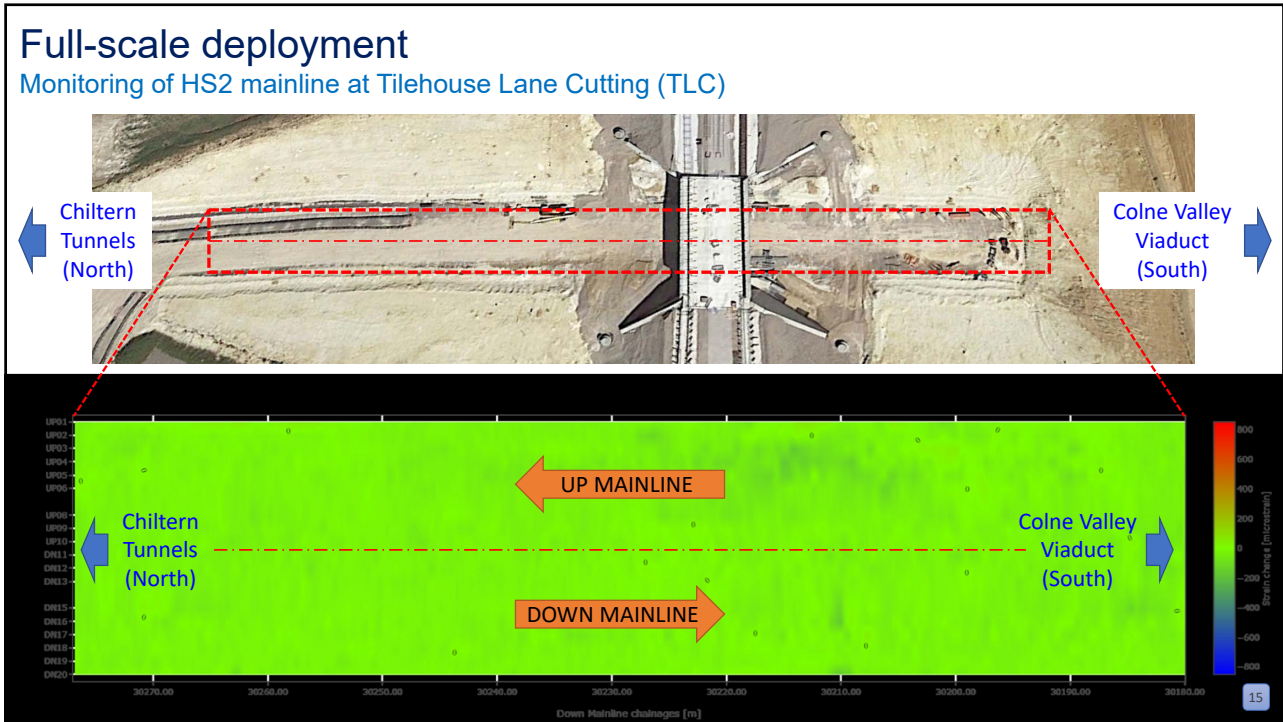
Monitoring of HS2 mainline at Tilehouse Lane Cutting (TLC)



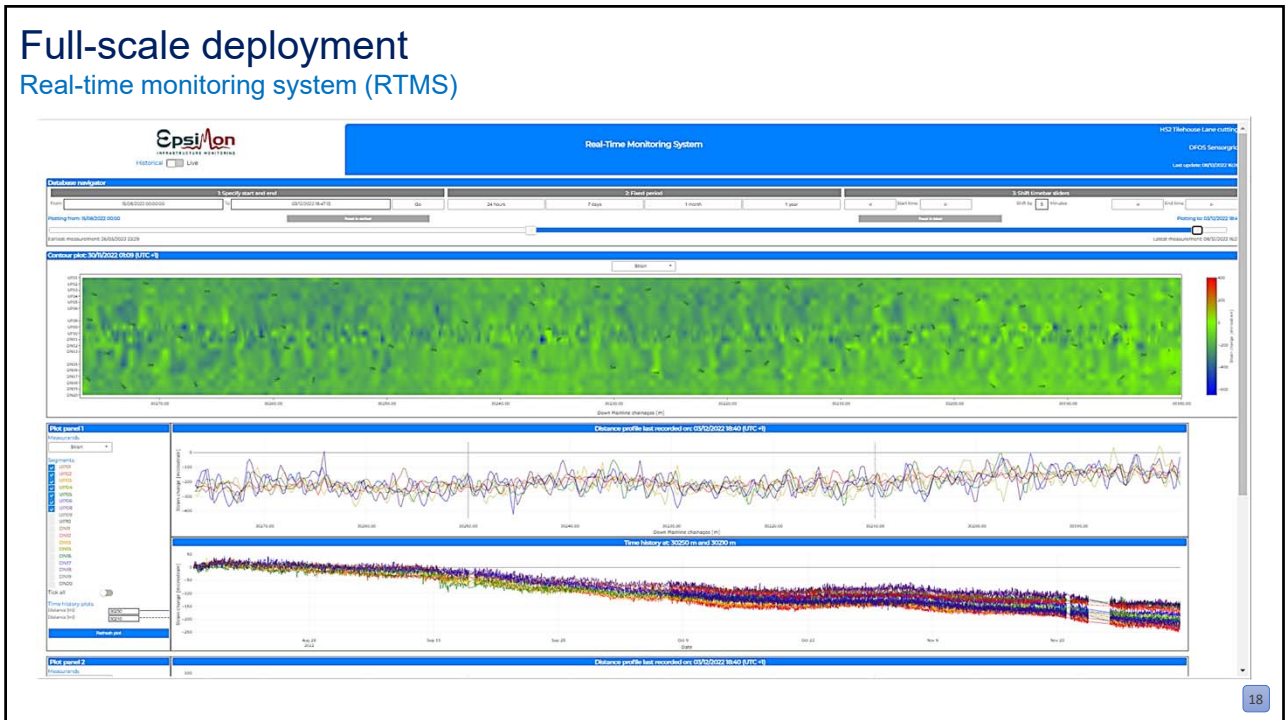
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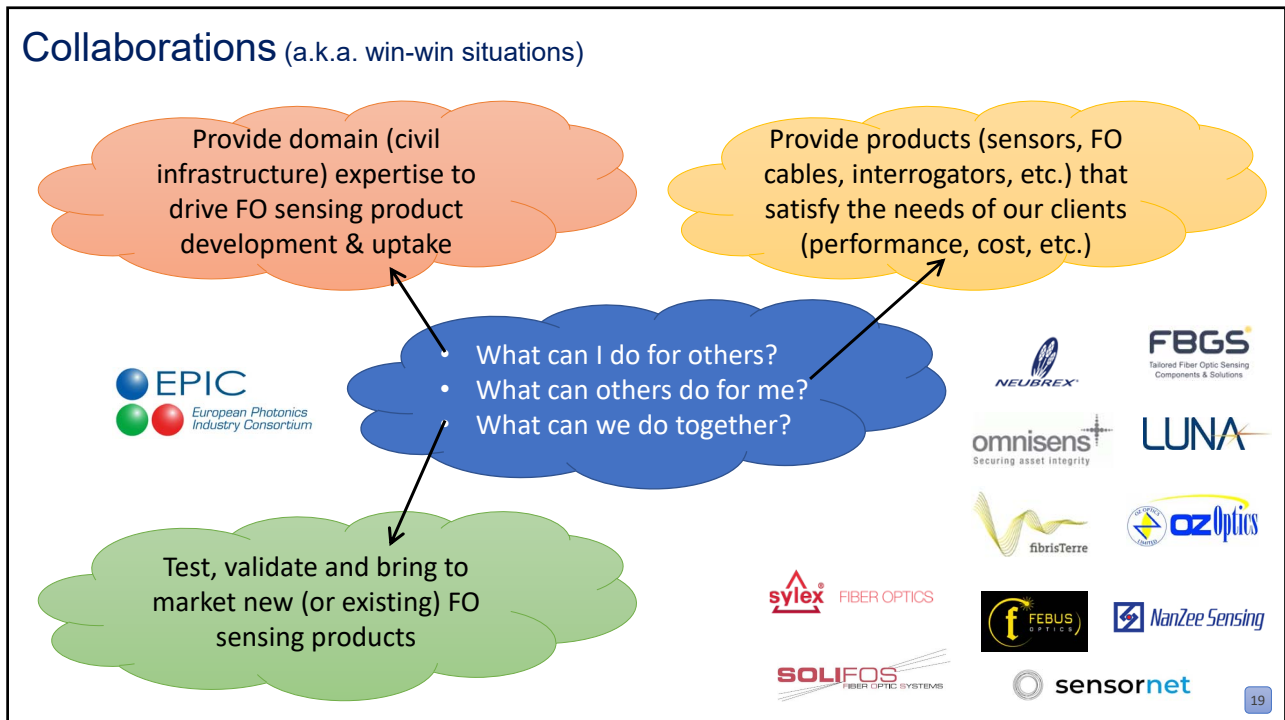












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**Dr Nicky de Battista**

Supported by:  
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