



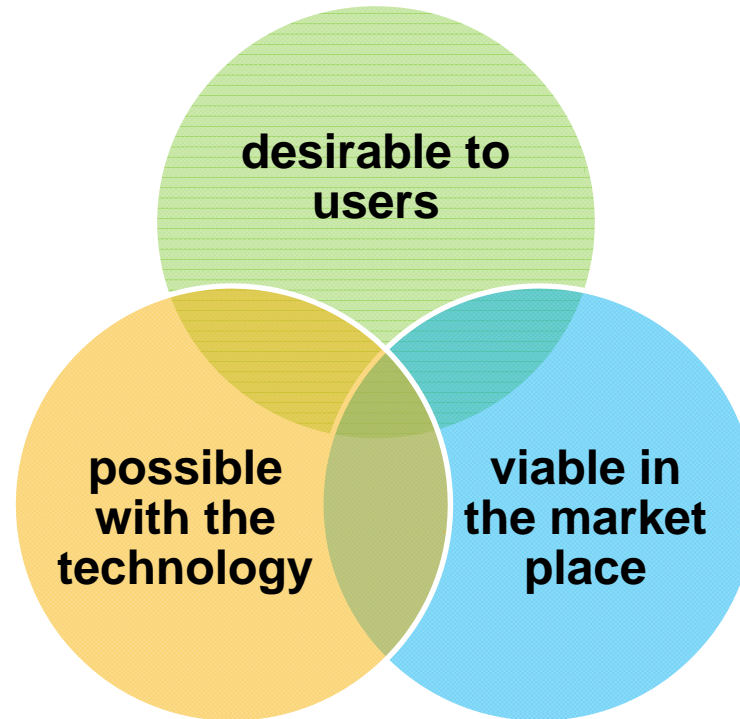
SOLETANCHE BACHY

**Forum Research, Innovation & Practice
ISSMGE conference - PARIS 2013**

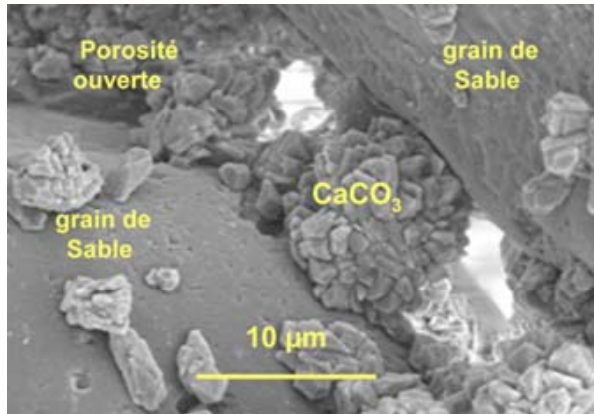
Serge BOREL
3rd September 2013

Innovation from different perspectives

- **Common understanding** : a new method, idea, product, etc. (oxforddictionaries.com)
- **Business understanding** : the idea or invention translated into a good or service that creates value for which a customer will pay. (www.businessdictionary.com)



Example of biocalcification (biocalcis, biogrout)



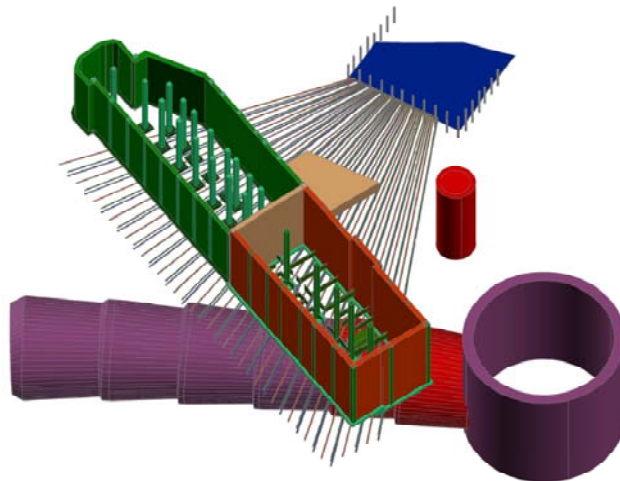
- **Academic** : it's an innovation if its work in the lab (concept proven)
- **Consultant** : it's an innovation if design and control method is available
- **Contractor** : it's an innovation, if it is feasible on large scale, at a competitive cost, and proven enough to give confidence to a client.



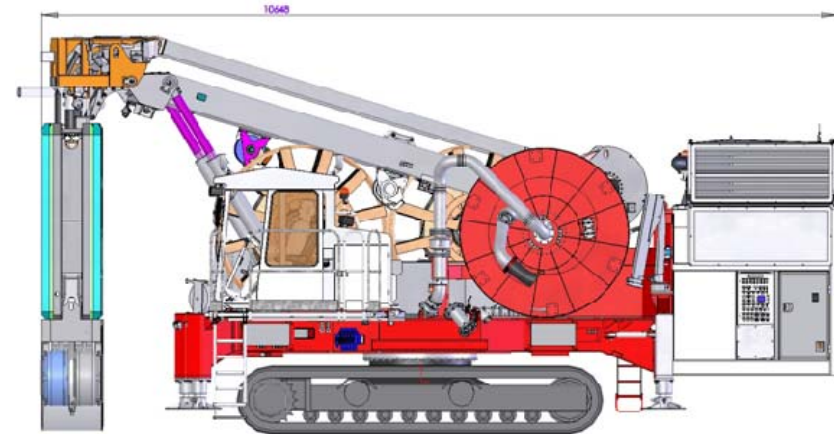
Innovation drivers

- **Meet the requirement of a client's job**

- e.g. Compensation grouting



- e.g. Low headroom / low noise equipment

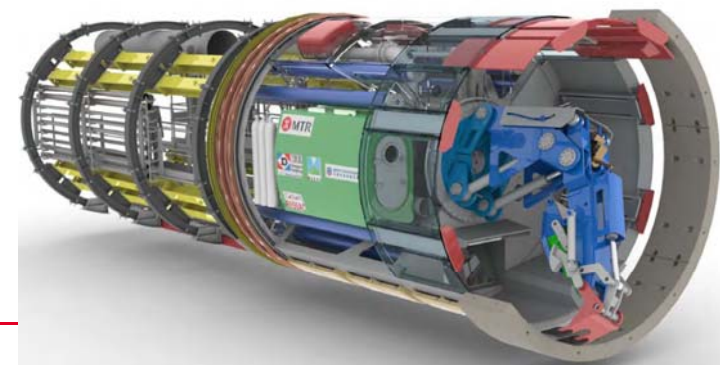


- **Anticipate the evolution of a regulation**

- e.g. waste and mud treatment cost

- **The competition**

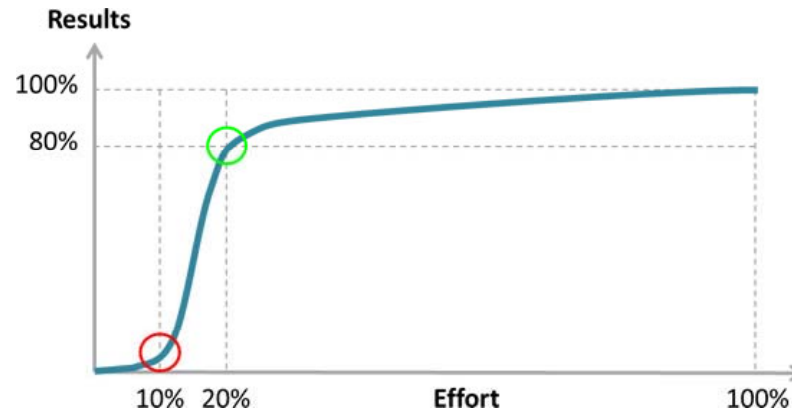
- e.g. Tunnel dismantling machine



Innovation freezers

- **The learning curve**

- Any innovation need time and tenacity to get to accepted.



- **The contract**

- Open to alternative design, prefer design and built

- **The standards**

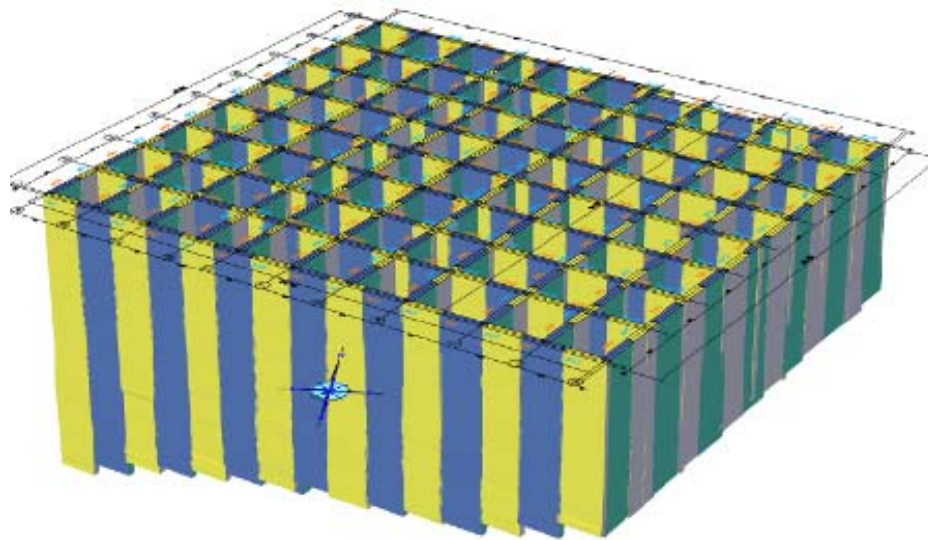
- Innovation is easier in repair and maintenance than new built jobs

- **Internal inhibitors !**

- Stakeholders have different appreciation of opportunity and risks

Challenges for the profession

- take full benefit of monitoring and quality control
- low noise, low vibration techniques for urban environment
- environmental friendly solutions
- drill deeper, bigger, faster, more accurately
- safer machines and processes for workers



Summary for discussion

- Different definitions of innovations
- Innovation drivers
- Innovation freezers
- Innovation challenges for our profession

