

Conference Series on European Hyperloop Technology  
with a focus session on  
The Development of Large-Scale Research Infrastructure

Q&A:

Research-Based Learning

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1. Q: How can the network of tubes be realized despite of local space and privacy requirements esp. in Germany? (I think of the electric windmill discussion that we are facing today)

A: A network of tubes must be in close relation to existing long stretches of highway or railway infrastructure. Furthermore, the Hyperloop will face less challenges as it is raised on pillars, so that it doesn't cut across land as the high-speed train normally does. Additionally, it doesn't create loud noises like cargo trains in cities or planes at airports and doesn't influence the environment as much as very large and high structured wind turbines.

2. Q: Emden has a large port (owned by the state of Lower Saxony) and it would certainly be worthwhile to build a new structure here for the future. What can local politics do to promote this form of mobility?

A: Local politics can increase the support for the development of prototypes and operational demonstrators. Lower Saxony is already supporting the research institutions by supporting initiatives for participation in EU Calls. This has led to participation in projects where Hyperloop is evaluated as part of a multimodal freight network. In addition, ports and transport operators should look into new technologies by themselves as well.

3. Q: Do you see any chance to operate Hyperloop intercontinental?

A: Hyperloop is a transport system that can easily shorten distances on a single continent. Connecting across oceans is not a very feasible solution right now. Nevertheless, solutions should be investigated where Hyperloop connects France with England across the English channel or even longer distances between Norway and Denmark or Scandinavian or Baltic countries with the European mainland.

4. Q: How can Industry and Research work together to create the best outcome for Hyperloop?

A: Industry and research need to work on shared projects to create the best outcome for Hyperloop. One possibility are EU projects. There are already some of these shared projects, like the ePICenter project. On the other side these projects also need to be initiated and funded on a national scale as well, which currently is not the case.

5. Q: What topics can students work on regarding a large-scale facility?

A: Students can work on many different subsystems, like magnetic levitation, aerodynamics and other physical and engineering problems. Additionally, a government structure and operating principles need to be developed. These will be elaborated in government funded

research projects, where students will be included in the process of research-based teaching.

6. Q: What is the biggest advantage of a research institution when comparing to industry?

A: Research institutions have the biggest advantage of unbiased evaluation of proposals and keep focus on the basic principles and objectives of the Hyperloop. Industry is driven by time to market, fast growth and profits, which can result in early routes, which are not compatible with future improved systems. Research institutions on the other hand can focus on the fundamental problems and sustain the vision of Hyperloop as a very economically and ecologically friendly transport system with a low energy consumption. A combination of both will result in the best system with reasonable timelines.

7. Q: What are the main research fields for Hyperloop when looking at Universities?

A: Universities will mainly look at specific subsystems, their performance and possible improvements. Additionally, research institutions can make unbiased evaluations of proposals and create a research network for shared European development.

8. Q: Which type of propulsion systems can work on hyperloop beside the electromagnetic one (like maglev)?

A: The electromagnetic propulsion is probably the best proposal out there right now. Nevertheless, there are different versions like the LIM (Linear induction motor) and LSM (Linear synchronous motor). One also has to differentiate between short stator and long stator electric motors which are best for different combinations of levitation and guidance systems. There are other propulsion systems as well, which then need to be compared to the efficiency and economic use of electromagnetic propulsion systems.

9. Q: Is Hyperloop really as complex as space travel?

A: Hyperloop uses many technologies which are already used in transport systems today. This will shorten the process and certainly make Hyperloop easier to develop. Safety systems can use similar technologies which are currently used in airplanes, railways, tubes and other modes of transport.