Sprint 2

Desalination of seawater

1. Cooling of seawater

Formation of ice + oil

- CERN CO2 cooling system: not necessary with very steady/uniform temperature
- Cryogenics: only know-how from CERN, no CERN technology

2. Solar desalination

Use energy from solar in reverse osmosis

- CERN Technology is an old technology uses solar collectors. Photovoltaics can be cheaper and efficient for this process
- Better solar solutions on the market

Electron beam for wastewater treatment

Could disinfect wastewater for reuse in certain industries. Eg: Textile industry, dyeing industry. E-beams can break the chemical bonds of large toxic molecules into smaller molecules which are less harmful for environment.

Already pilot projects in Korea that seem successful

Also considered electron beam for virus containment (use beam to kill viruses on surfaces in hospitals and clinics) but there are cheaper chemical process available. But could be used to kill viruses in human waste. (For eg: Ebola contained waste)

No specialised CERN technology, only **know-how** regarding electron beam

Can be investigated further for more applications.

Titanium polishing

1. Medical applications

- Looked mainly at medical implants
- The high specificity of polishing is not needed for implants - they want more surface roughness

- Room for further investigation - Could look at polishing of medical tools

2. Aerospace applications

- Not sure if the polishing process can be used for titanium alloys.
- Ti is used as fasteners for Carbon structures. You don't need high polishing
- In the gas turbine engine, only compressor parts where temperatures are low is made of pure titanium and the rest of engine is mostly Ti-alloys.

- Room for further investigation