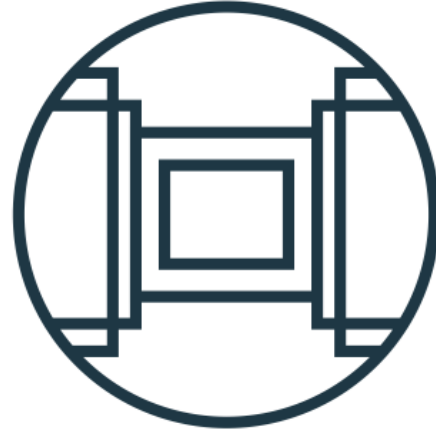




**Future Superconducting Magnet Technology**  
**FuSuMaTech IP workshop**  
**Recap of yesterday and objectives of today**  
Antoine DAËL & Han DOLS



FuSuMaTech



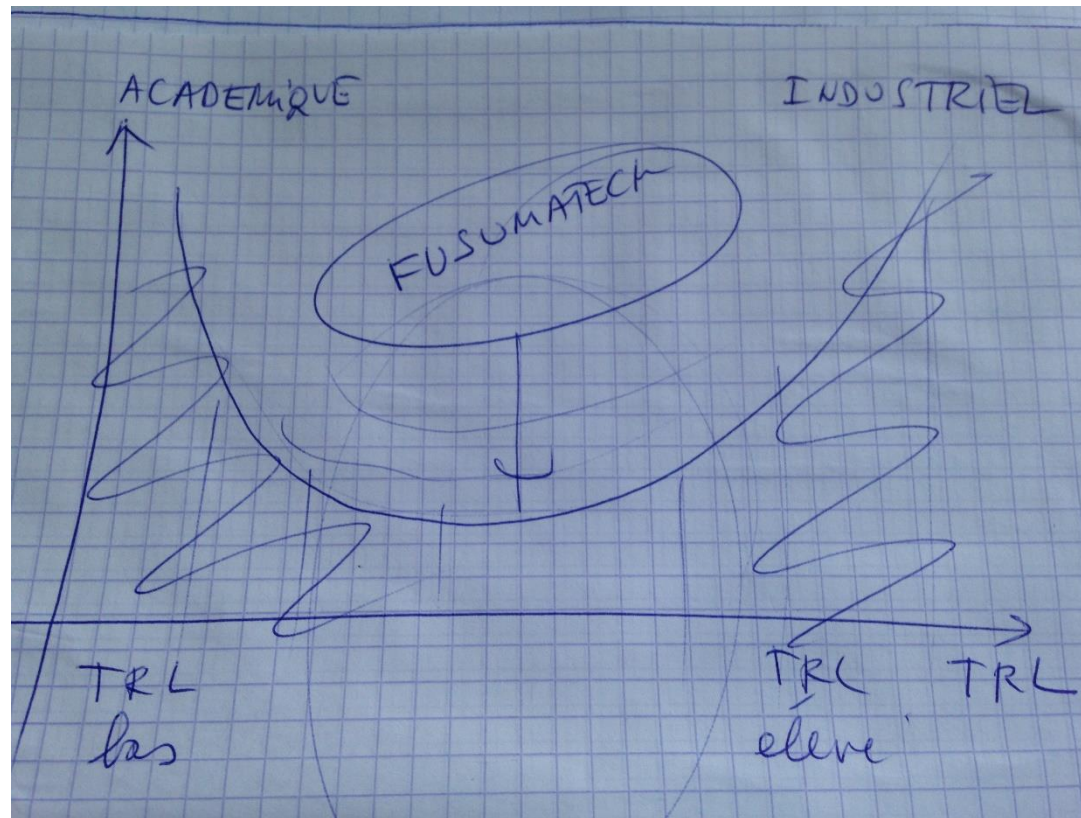
# FuSuMaTech

**Recap of yesterday and objectives of today.....**

Summary of FuSuMaTech by Patricia.POSTIGO-MCLAUGHLIN@ec.europa.eu  
Policy officer at European Commission

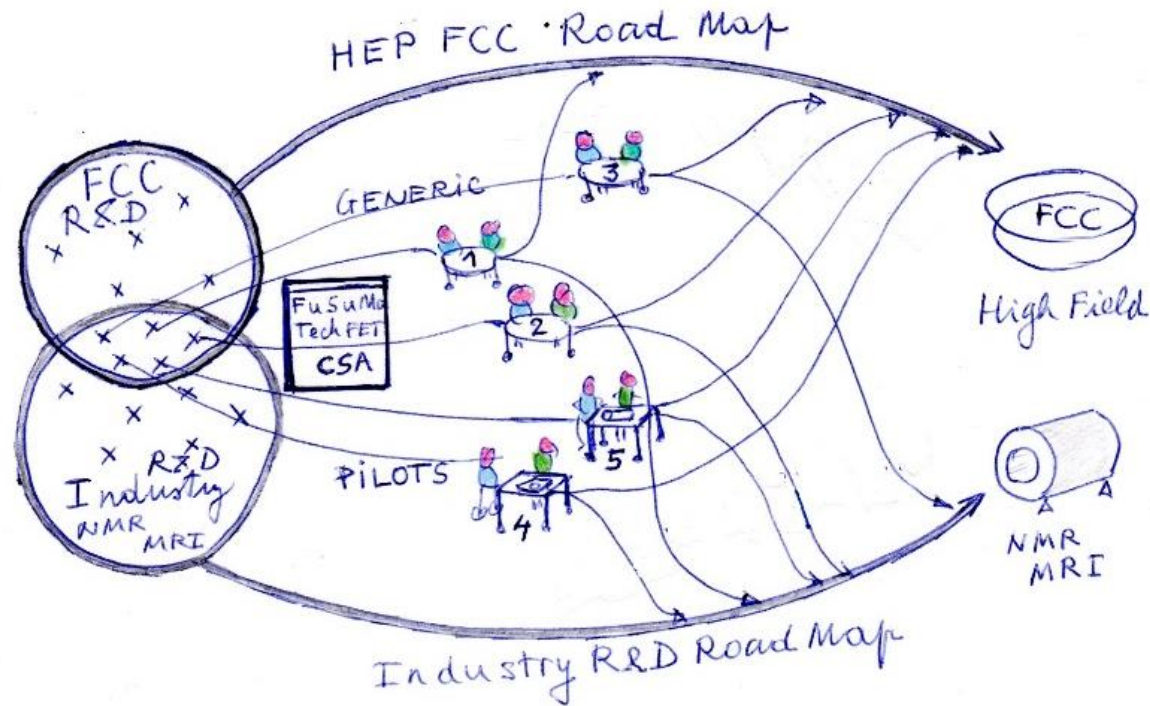
- FuSuMaTech is an initiative that builds on the technological advances in superconducting magnets in the context of the HL-LHC (the upgrade of the Large Hadron Collider at Cern) and the FCC (Future Circular Collider).
- The magnets being developed for these particle physics infrastructures will open the door to new applications in other fields, and CERN and CEA teamed up to establish a working group to look into applications and possibilities of cooperation with industry.
- This mapping is being funded at the moment by a FETOPEN CSA (end date April 2019).
- **FuSuMaTech aspires to define the most efficient way to collaborate with industry and academia** in overcoming technological barriers to bringing products into the market, supporting a European cluster in applied superconductivity.
- It will enlarge the innovative potential especially (but not only!) in High Field NMR and MRI, opening new possibilities in brain observation.
- FuSuMaTech was discussed at the annual CERN/EU meeting a few months ago and we already brought FuSuMaTech to the attention of unit D1

- FuSuMaTech aspires to define the most efficient way to collaborate with industry and academia in overcoming technological barriers to bringing products into the market, supporting a European cluster in applied superconductivity.

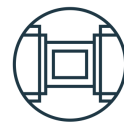


# Recap of yesterday : it happenned in Ideasquare ! THANKS

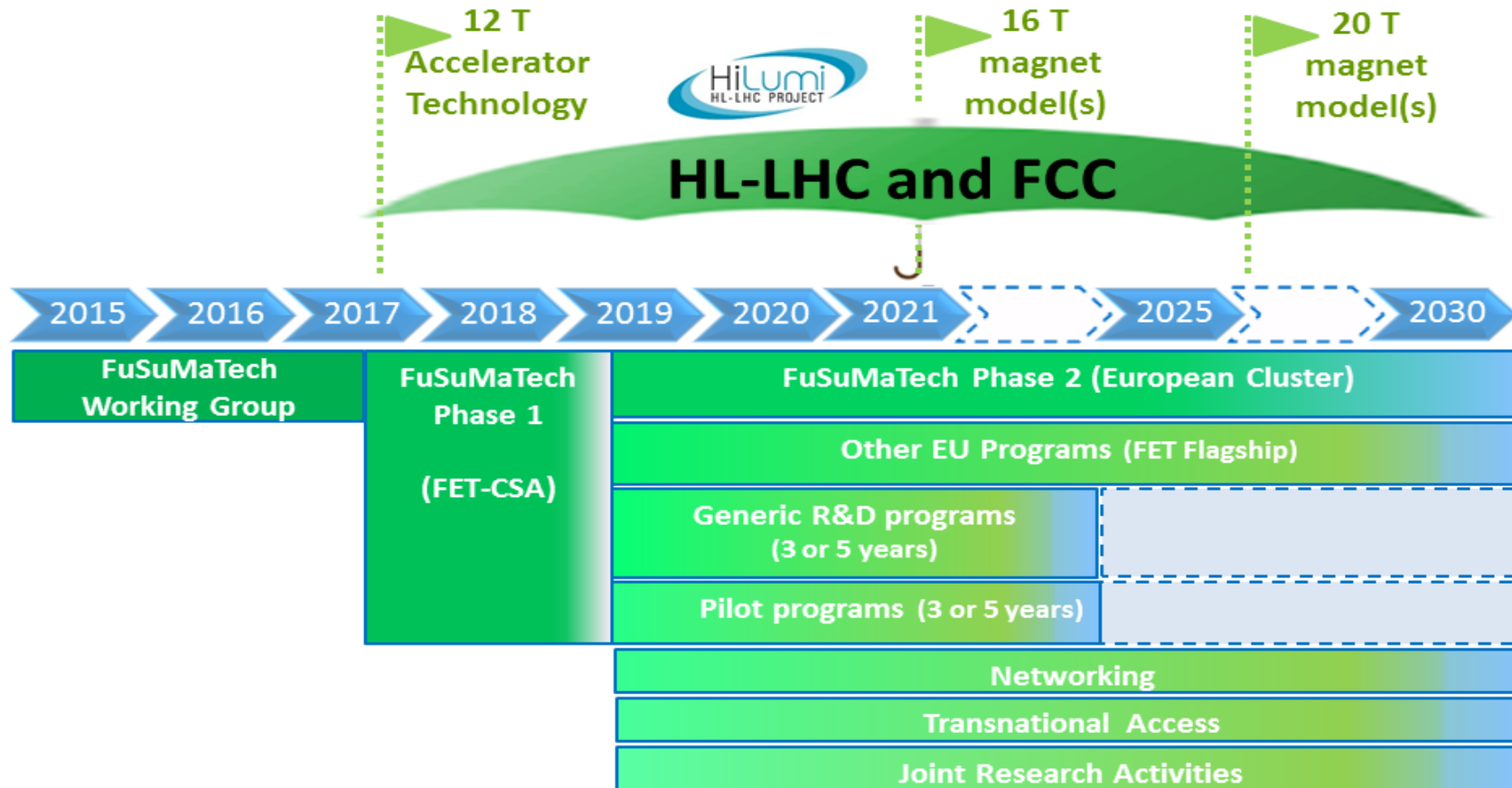
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2



# FuSuMaTech Overall roadmap & time scale



# Cristian

- **Task 5.1** MgB2 Technology key-demonstrator: Solenoid 1m in diameter, 2m in length and 5 T. (**SIGMAPHI** , CEA, ASG)
- **Task 5.4** Technology key-demonstrator of an HTS insert for HFML. (**BNG**, LNCMI, CEA )
- IP aspects
  - Tasks are clearly defined and clearly distributed
  - Both projects are close to maturity
  - IP sharing is still be refined on a few points

# Bernhard and Daniel

- **TASK 4.1** Quench analysis new approach based on new computing capabilities and on multi-physics. (**PSI, Elytt, KIT**)
- **TASK 4.3** Smart diagnostics, Cold wireless instrumentation, and «embedded intelligence» for Quench detection and quench management. (**CERN, CEA**)
- IP points are :
  - Making use of CERN IP
  - Licences of existing commercial softwares
  - Future licencing of the new tools
  - Patents and licensing for future diagnostics



# Simon

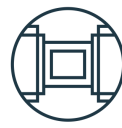
- **TASK 4.2** Large material properties database at Cryogenic temperature.(STFC,CERN, OXF INST,KIT,PSI)
- **TASK 4.4** Heat extraction and helium free cryogenics.(CEA, BNG, ELYTT)
- **TASK 4.5** New high stress materials at cryogenic temperature.(KIT, OXF INST, CERN )
- IP points :
  - Significant work already done
  - Obvious conclusions ? Please write them
  - FuSuMaTech is not a legal entity
  - Access to existing data to be studied

# Antonio : MEDICAL APPLICATIONS

- **Task 5.2** Frontier edge High Field MRI concept magnet: whole body 16 T.(**CEA, TESLA, ASG, CERN**)
- **Task 5.3** Open MRI magnet, interactive people magnetic chamber. Mammo-magnet (conceptual design).( **ELYTT, CEA, CERN**)
- **Task 5.5** Gradient coils technology for high field MRI, over 10 Teslas.(**TESLA, CEA**)
- IP aspects :
  - “Bring issues to the surface”
  - Black box scheme should be overcome for the long term strategy
  - There are in EU around 200 engineers highly skilled in SC magnets. European Industry should keep its historical role based on this culture!
  - **5.2** Come back to concept magnet : reformulate workplan for a conceptual study , use HL-LHC & FCC advanced ideas.
  - CERN & CEA contribution ( + Universities ?) to be reinforced in **5.3 Mammo Magnet and social Magnet**
  - Connectome example to be visited for **5.5 : long term ambitious and innovative ideas.**
  - FuSuMaTech is the real opportunity

# Practical instructions for restitution

- One restitution per Task ( 10 subjects)
- Short technical summary
- Feed up the IP matrix
- Propose an IP scenario ( Myriam )
- Ask open and stupid questions : it is better to look stupid and understand than....
- Write down short and clear sentences **NO ONLY BULLET POINTS**
- Upload your Power Point before lunch
- Han and Antoine will wrap up your contributions
- **THANKS**



FuSuMaTech



ELYTT ENERGY



Karlsruher Institut für Technologie  
FuSuMaTech IP Workshop CERN 19th & 20th of April 2018  
Antoine Daël & Han Dols

