

Questions for HEP Next Strategy

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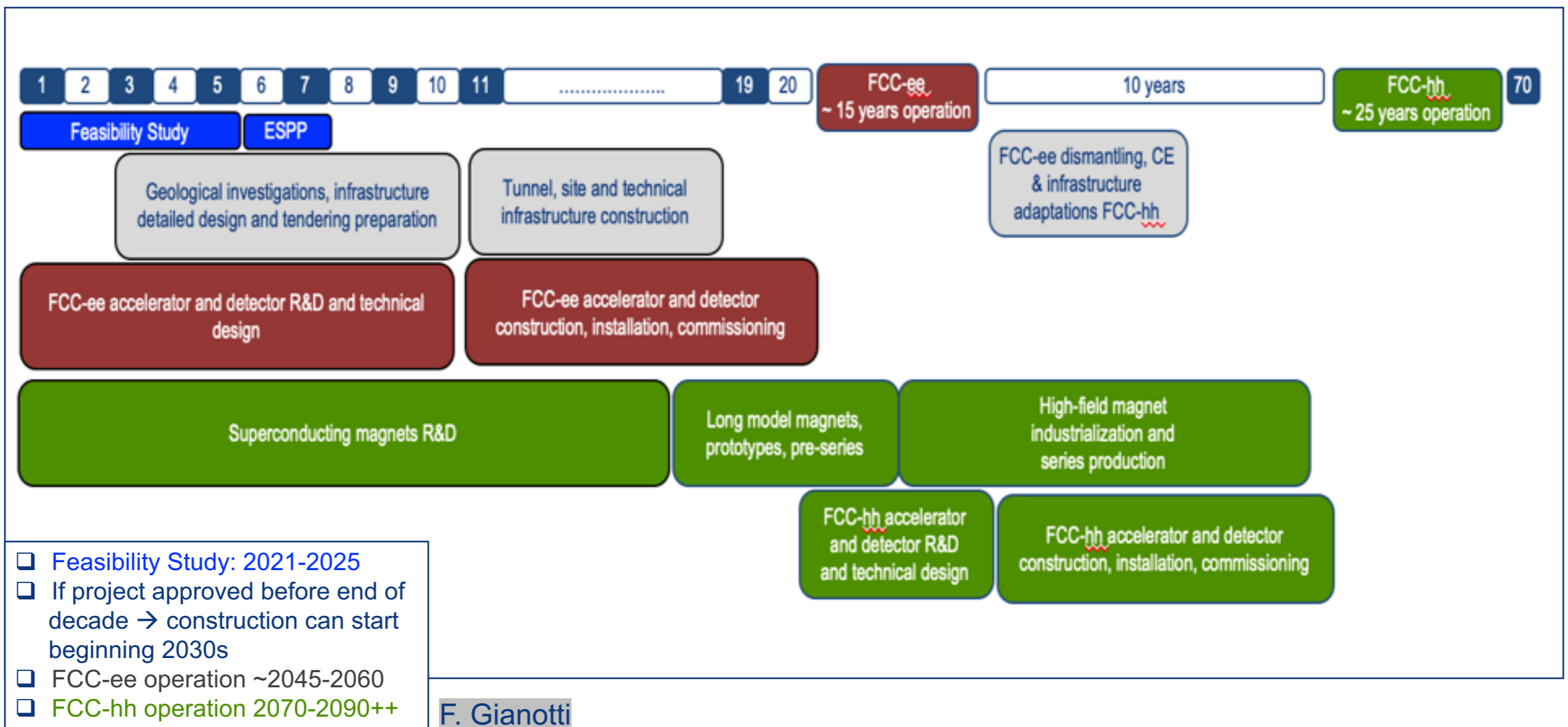
**HEP Roundtable workshop,
Feb. 27, 2023**



Benchmark FCC Project

- FCC project is excellent example for future strategy

- Technical timeline for FCC

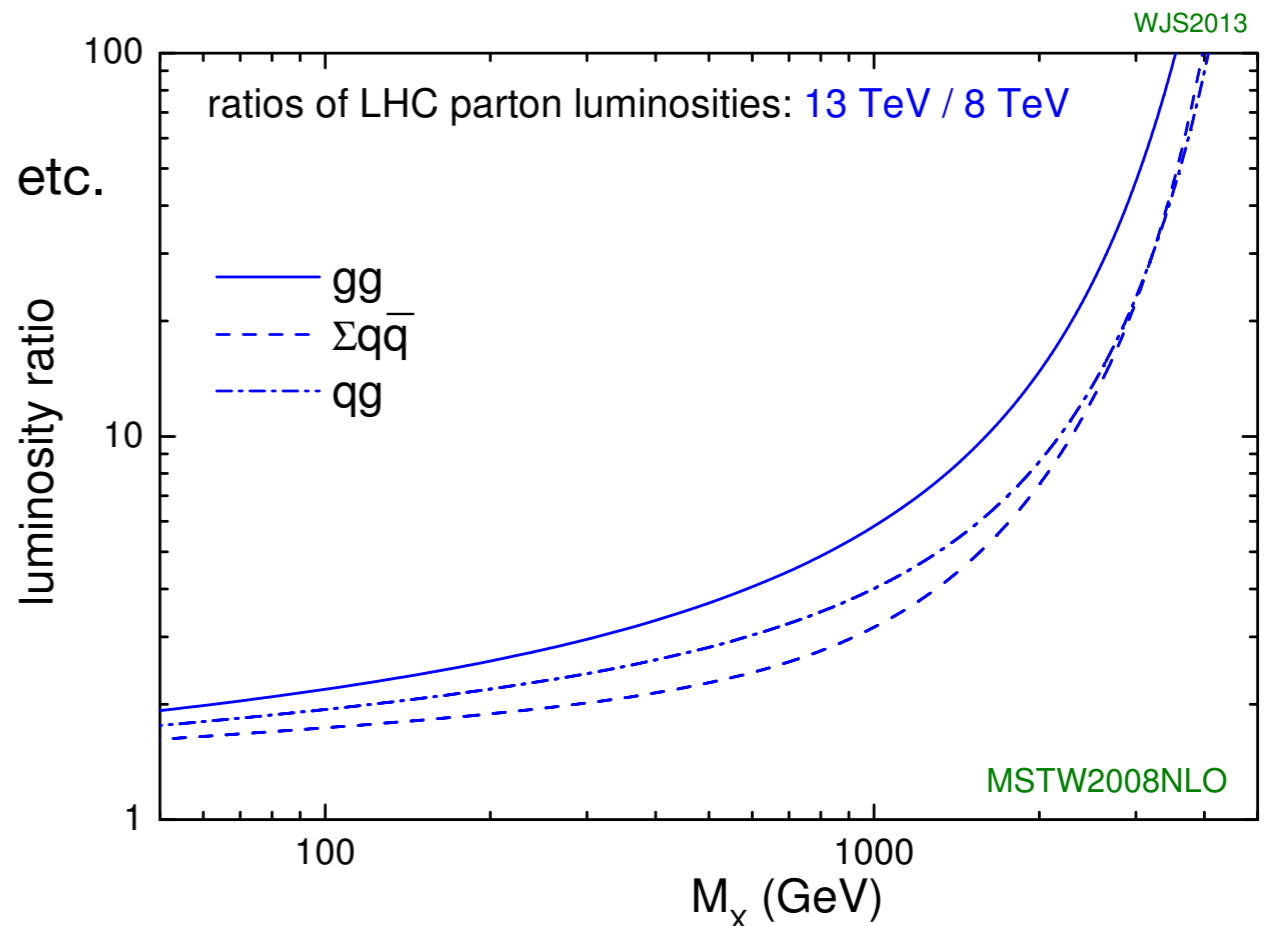


Agenda

- Question 1: physics vs. resource?
- Question 2: if physics, target to HL-LHC vs. FCC?
 - We have a lot of other interesting/competitive candidates (locally and globally): BELLE, KNO, DUNE, dark matter, etc.
- If resource, SRC, BNL, others?
 - It's going well
 - CERN associate membership => I think it's resource category but irregular one, not like SRC/BNL

Agenda: Physics

- Question 2: HL-LHC vs. FCC?
 - HL-LHC: 3000/fb, 20 times larger than current data (~150/fb)
 - Target 1: still search? => then explore unknown parameter space
 - Can not improve dramatically anymore beyond 2016 data analysis
 - Focusing: low/EWK scale (scouting), b-physics (b-parking), etc.



Agenda: Physics

- Target 2: precision measurement
 - Uncertainty: statistically vs. systematically dominant?
 - Systematically: ex) W mass measurement
 - Statistically: rare decay mode
- Things to consider
 - Detector resolution/performance
 - End of HL-LHC or think beyond like FCC?

Technical Aspects

- How to publish the results in CMS (ATLAS, other LHC experiments) so fast?
 - Secret weapon 1: prompt reconstruction architecture
 - Secret weapon 2: (many => almost all) centralized performance
 - Users can use most of centralized performances like event selection, scale factors, etc.
- If precision measurement, you should do (almost) everything by yourself
 - Take a lot of times longer than previous publications

My Current Strategy

- Personally, dilepton (ee , $mumu$, emu) is essential in CMS detector for reliable precision
 - Dilepton+X channel
 - Personal interest: low mass under EWK scale using scouting
- But for my future connection to FCC, I am moving to Higgs/Top sectors to my physics concerns
 - All possible channels related to calorimeter detector
 - This transition will be continued till FCC project
- ... and detector R&D for FCC
 - Dual-readout calorimeter
 - New detector concept: 21st century image detector

Power of Scouting

137 fb⁻¹ (standard triggers) and 96.6 fb⁻¹ (scouting triggers) (13 TeV)

