

# Future Infrastructures

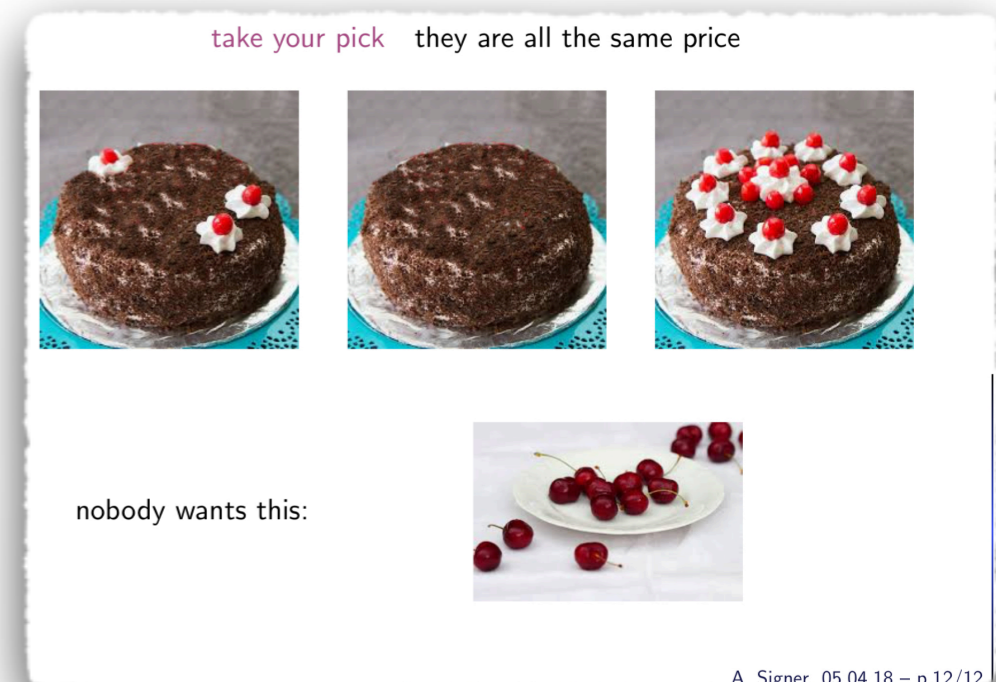
## Discussion Session

### Introduction

G. Dissertori

# Salient questions (non-collider programme)

- How could a **beam-dump infrastructure** at CERN be exploited to the maximal extent possible?
- Do we (CH) want to support a continuation of the high-intensity programme at PSI?  
(as part of a broader flavour physics programme, including eg. an HL-LHC LHCb extension)



# Observations and salient questions (1) (future accelerators/colliders)

- There is quite a long list (or rather “large matrix”) of possible future accelerator options (beyond HL-LHC) currently on the table:
  - HE-LHC ; FCC-ee, FCC-eh, FCC-hh
  - ILC (the first possible “low-energy” ILC), extensions of it in energy, CLIC, and/or a “low-energy” version-0 of CLIC (“CLICino”)
  - and a number of possible “combinations” or rather “sequences” of those, such as
    - HE-LHC  $\rightarrow$  FCC-hh; or FCC-ee  $\rightarrow$  FCC-hh ; etc.

# Observations and salient questions (2)

- What are “**realistic**”, “**feasible**”, “**dangerous**” sequences? eg.
  - HE-LHC  $\rightarrow$  FCC-hh versus  
HE-LHC  $\rightarrow$  FCC-ee  $\rightarrow$  FCC-hh versus  
FCC-ee  $\rightarrow$  FCC-hh  
CLICino  $\rightarrow$  HE-LHC  $\rightarrow$  Muon collider
  - and alike...
- There is often talk about “**synergies**”. What is really meant? And in case there are such synergies, which combination of options has the greatest potential of synergies?
- How would the construction/operation of a Linear Collider in Japan **impact** the plans at CERN?  
Same question about the possible machine(s) in China....

# Observations and salient questions (3)

- **Reach in energy/luminosity and physics potential** of a linear vs a circular **lepton collider**?
  - things to consider:
    - if there are, what are the upgrade options?
    - what are the limitations (in energy, in luminosity)?
- What are the **show-stoppers** of the various options?
  - eg. **technical** and/or **political/societal** ?
  - **Correspondingly: what are the most important actions to be taken in the coming ~10 years?**

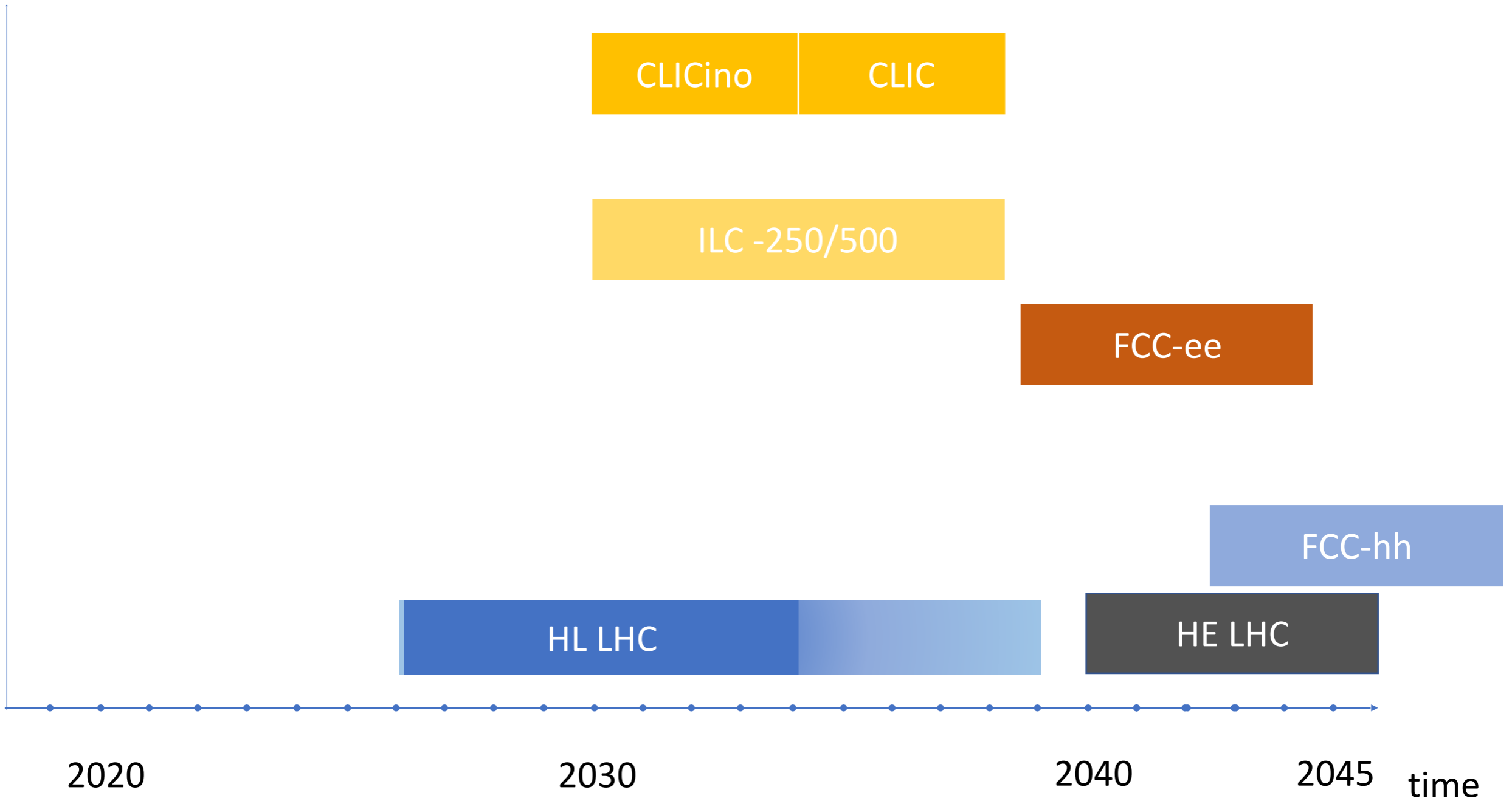
# Observations and salient questions (4)

- What are the **Figure of Merits** (or “axes”) along which to build a portfolio and put down scenarios?
  - **physics potential — time — cost — continuity/long-term perspective — ?**
- **Do we forget and/or underestimate any other option?**
  - **eg. muon collider, or Plasma-Wakefield acceleration**  
**or HTS magnets** for the next pp machine ?
- **How ambitious do we want/have to be ?**
- **Is there any other possible future of CERN (or of the entire field) ???**

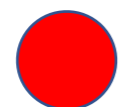
# Scenarios

as proposed by the  
Pillar1 White Paper Editors

**MANY THANKS TO RAINER FOR DRAFTING THESE**



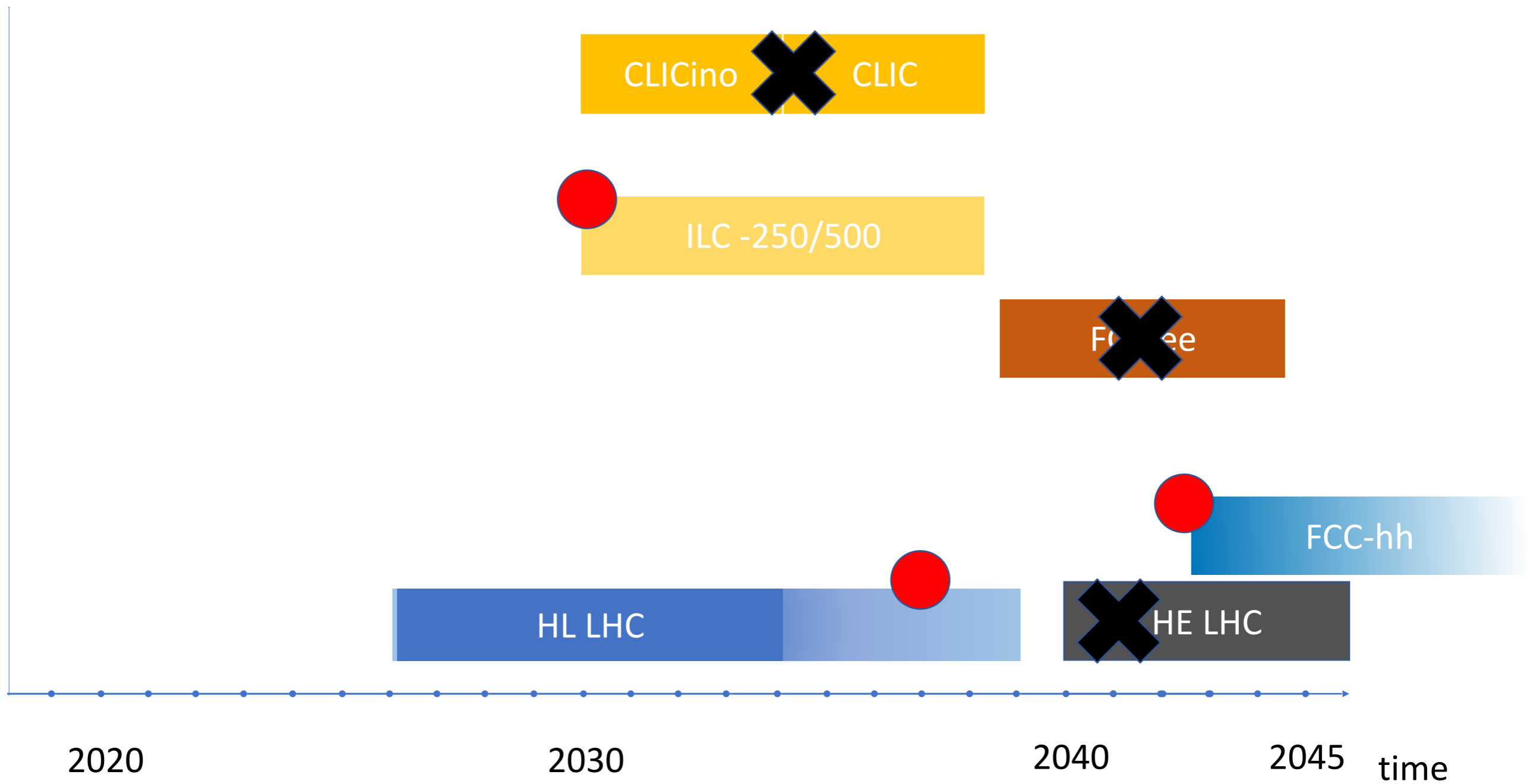
**Legend:**

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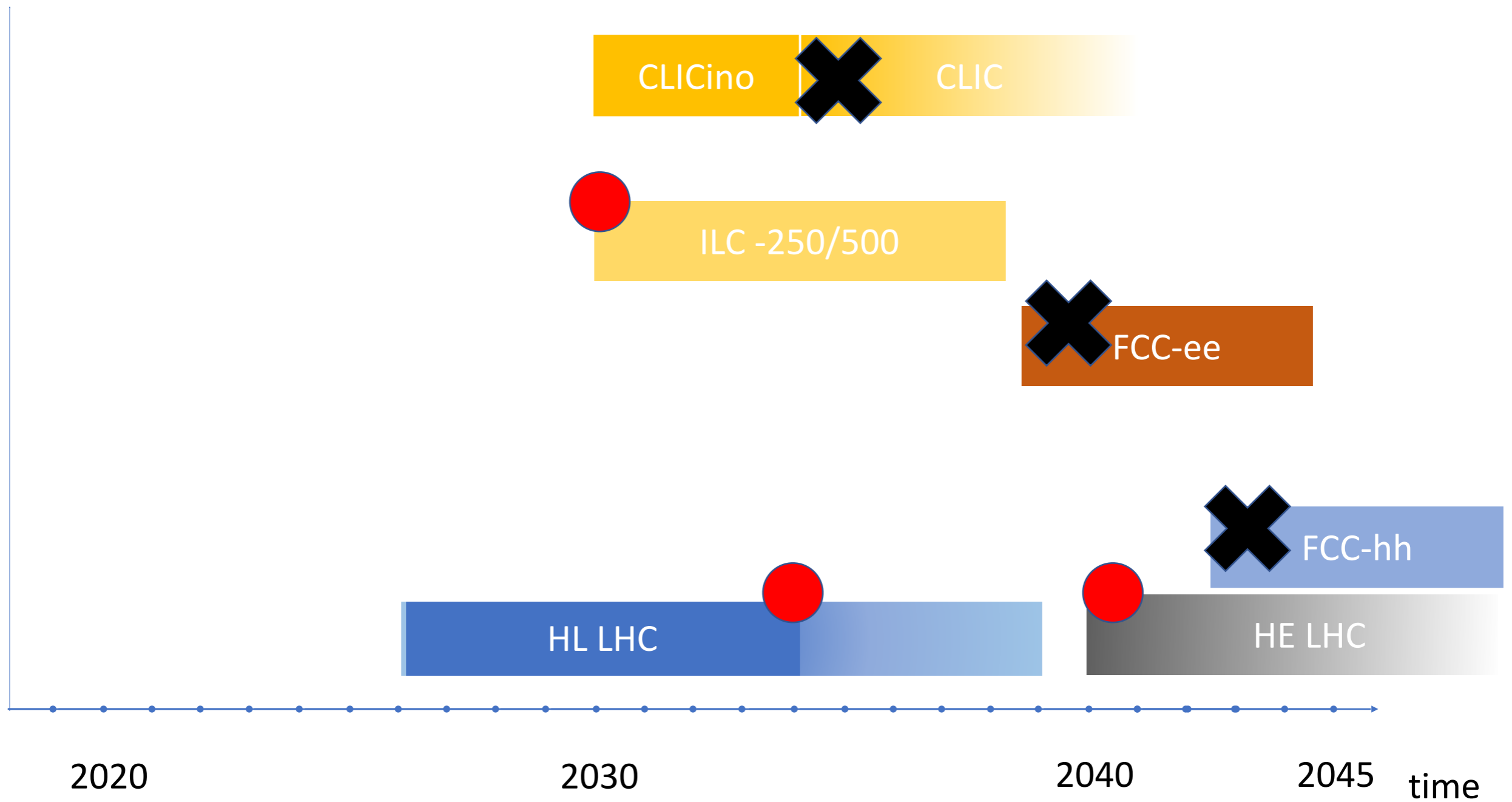
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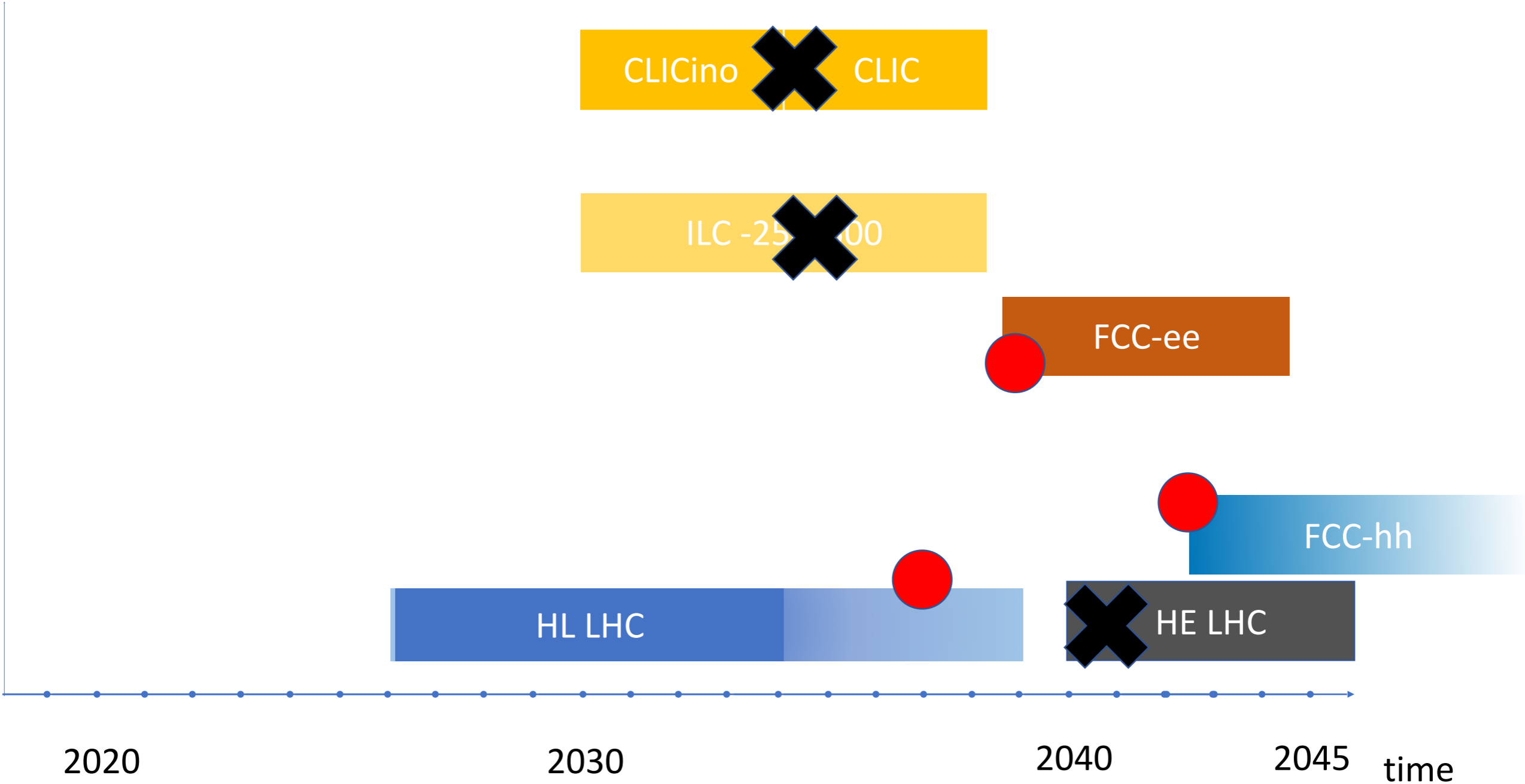
# Scenario 1a: ILC + FCC-hh



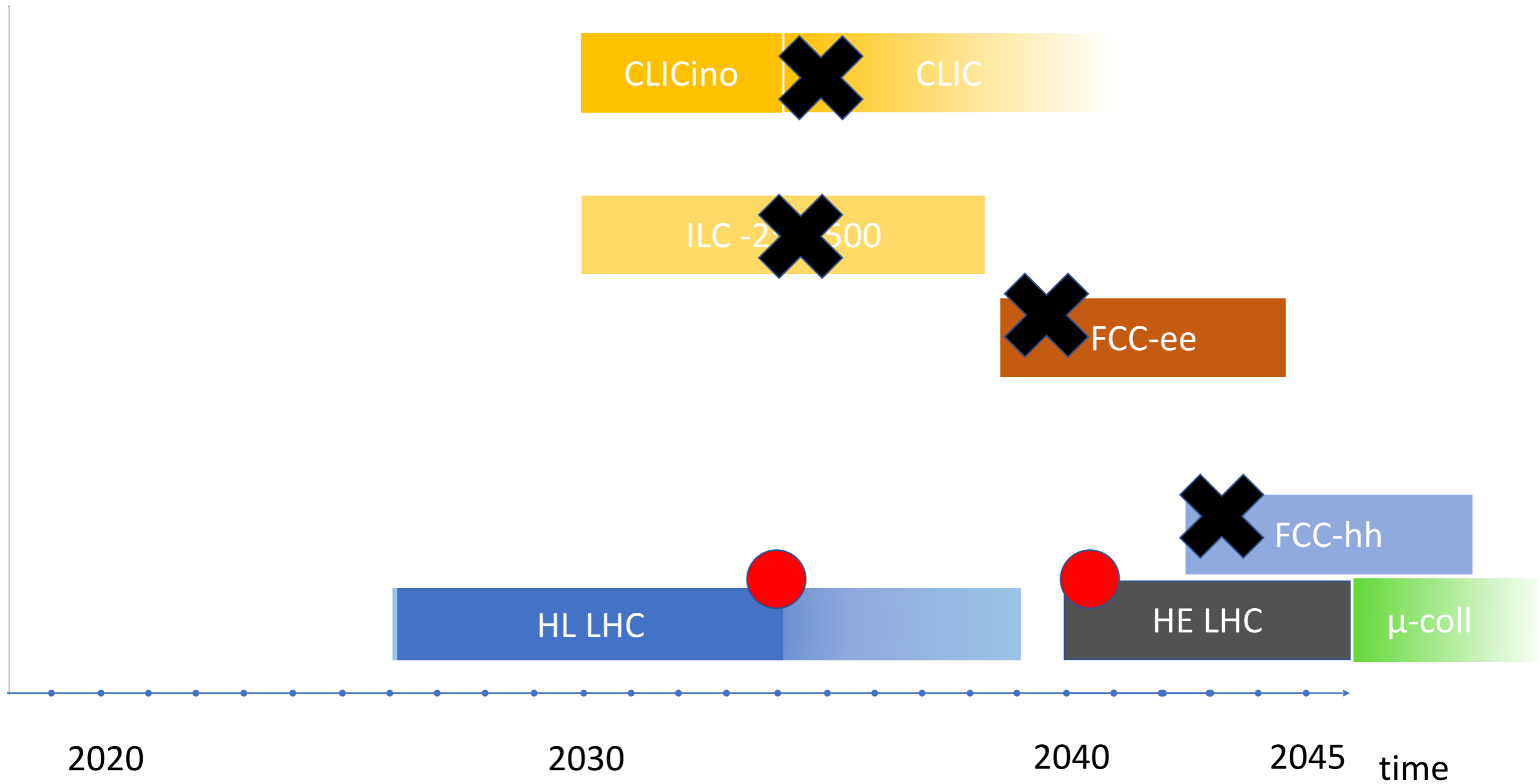
# Scenario 1b: ILC + HE-LHC



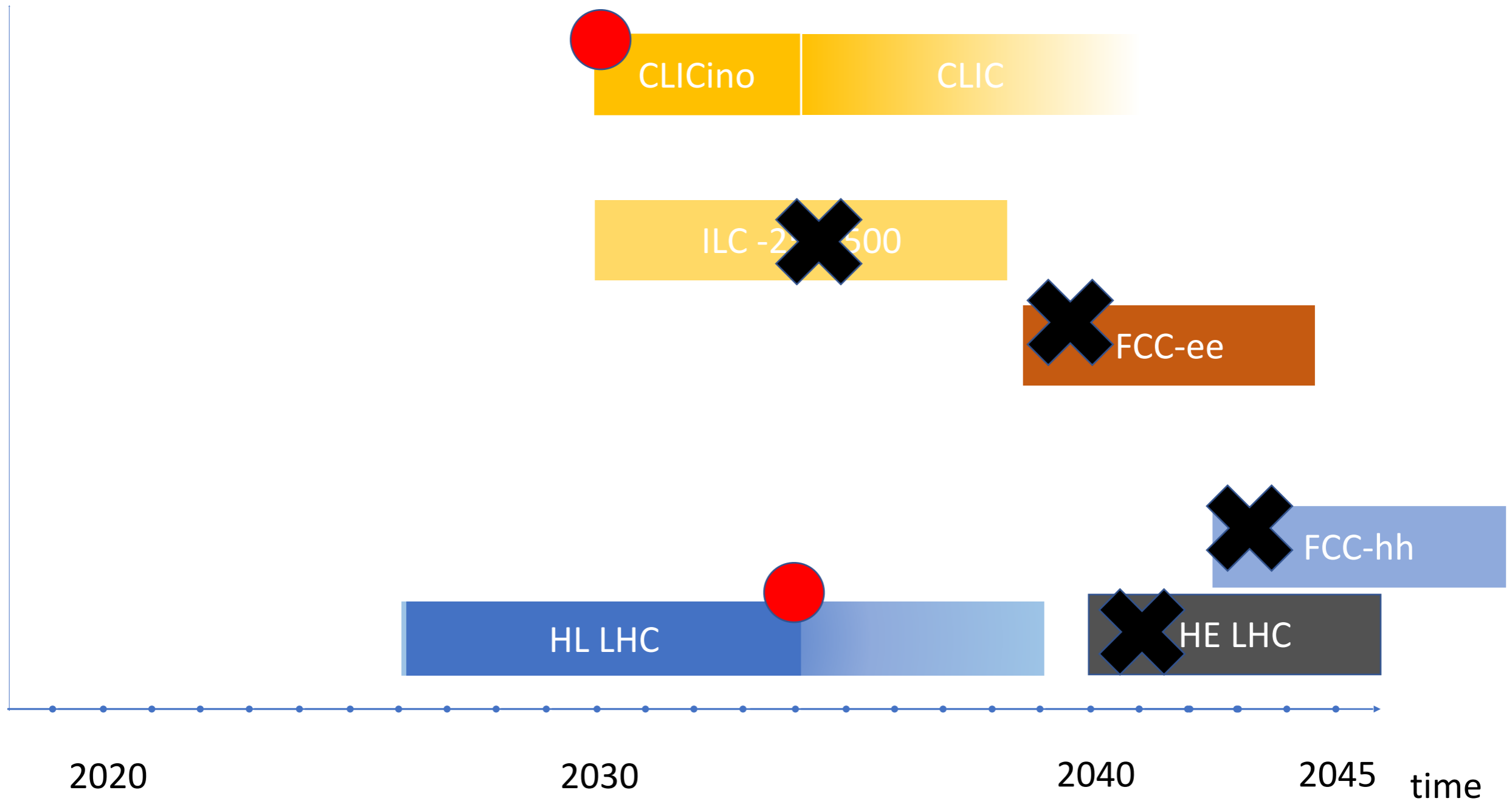
# Scenario 2a: FCC-ee + FCC-hh



# Scenario 2b: HE-LHC + mu-C



# Scenario 2c: CLIC



Z pole: 1500  
WW: 200

