

HKUST IAS HEP conference
Panel Discussion

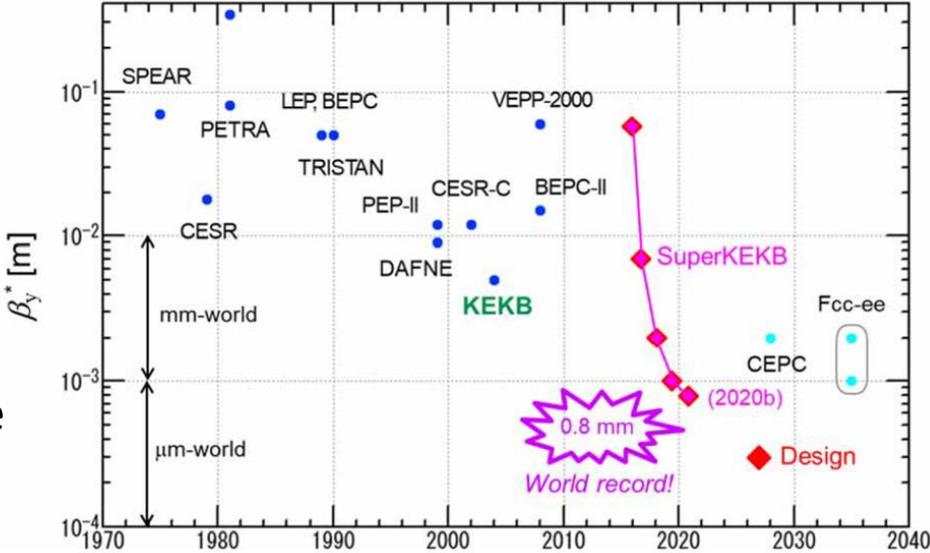
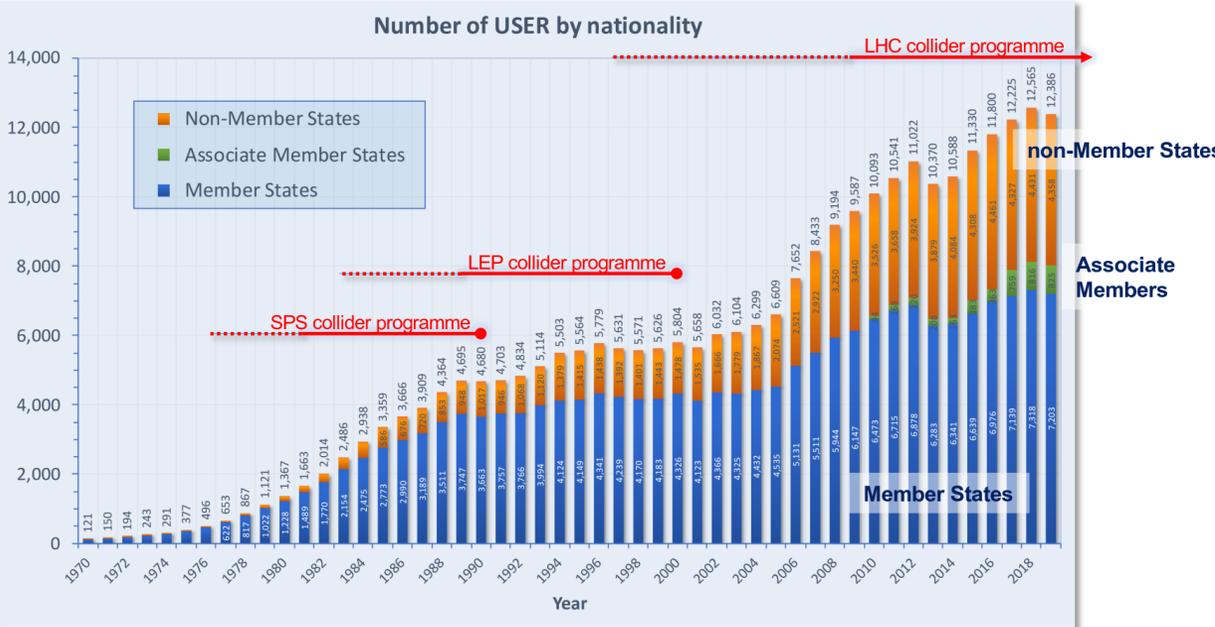
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Unique Assets – a Key to Future Success

- **Powerful collaborative approach** is characteristic for our HEP and accelerator community, **open across cultures, religions, borders, boundaries ...**
- Particle Physics community has an enormous **ability to drive the necessary frontier R&D** and to achieve the required progress in all implicated technological areas.
- Community has a long breath and the **demonstrated ability** to design, plan and then execute **very-long term programs with a successful completion.**
- An **efficient project management culture** has been developed, not only by machine experts, but also by the experiment collaborations.
- **Particular know-how available, for coordinating largest scientific projects in an open environment, with expertise and competencies available in a large number of diverse areas.** Nevertheless we need to be extremely cautious, in particular when going for green-field approaches, see e.g. SSC, ITER, etc.

Evolution of CERN Users



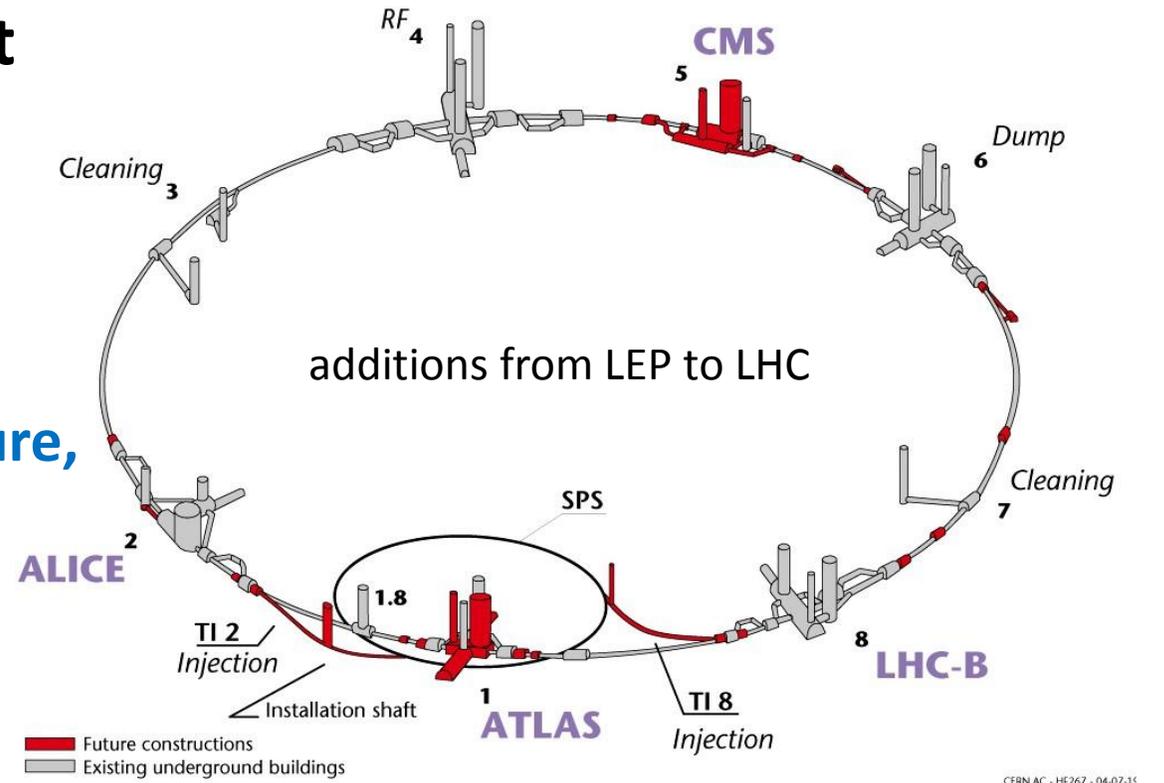
Learning from history on exploiting past investments - successful examples

LEP → LEP-2 → LHC → HL-LHC

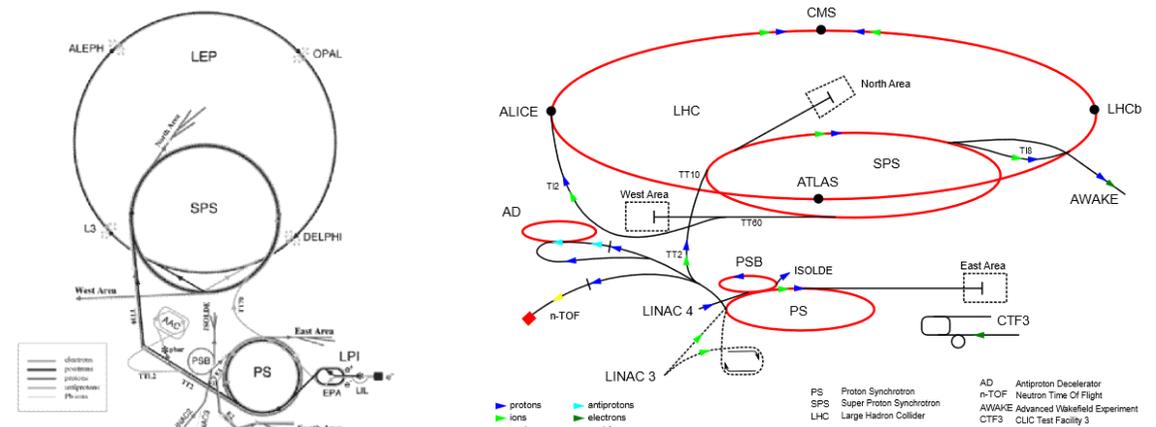
Example for a **world class research infrastructure, attracting scientists, physicists, engineers & students over a period of ~60 years (1980 – 2040) and producing top science results.**

LHC re-used all existing infrastructure, not just from LEP, but entire injector complex.

PS still the heart of the complex after >60 years – fantastic example of efficient (re-) use of past infrastructure investments



CERN AC - HF267 - 04-07-15



PS & SPS as part of the LEP and LHC injector complexes

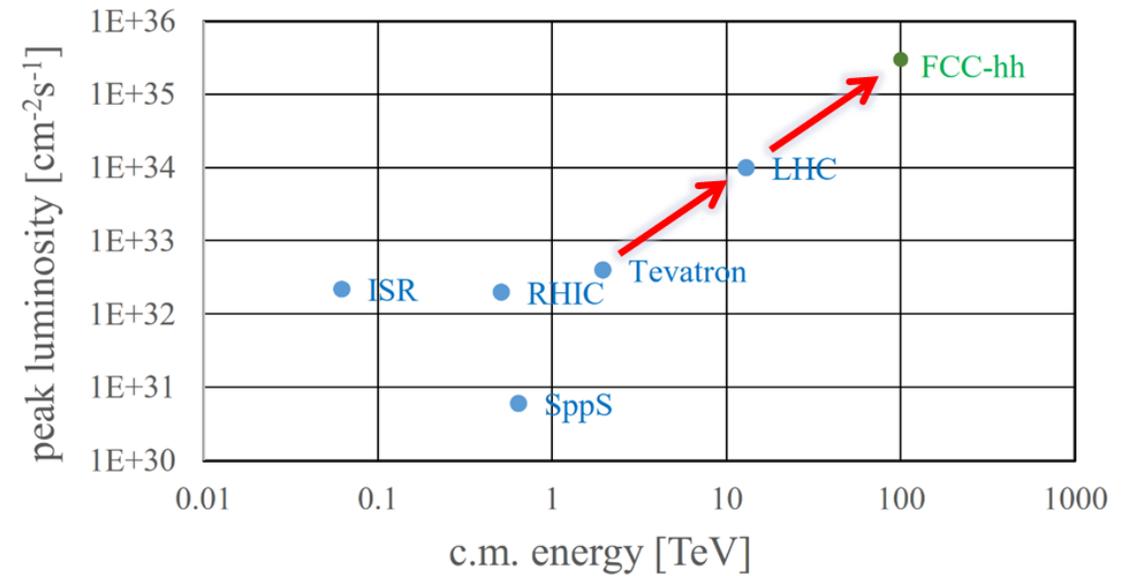
Scaling from project experience:

Step from LHC to FCC-hh similar to step from Tevatron to LHC (order of magnitude in luminosity and in energy); community has demonstrated that they can master steps up of this order
FCC integrated program inspired by the LEP/LHC program, but significantly larger:

→ going beyond present CERN organisational and financial models; requiring a truly global approach

→ foundation of such global efforts to be prepared and implemented already in conception phase, building up vision, ownership & commitment around the world from the very beginning of this challenging endeavour.

→ Important for any of our future projects



	2020	2025	2030	2035	2040	2045
RHIC	AA, pA, pp					
EIC	TDR	Construction	20 GeV → 140 GeV			
LHeC	TDR	Construction	1.3 TeV			
(HL)-LHC	14 TeV					
CEPC	TDR	Construction	240 GeV	Z W	SppC	
ILC	Pre-constr'n	Construction	250 GeV			500 GeV
CLIC	TDR, pre-constr'n	Construction	380 GeV			1.5 TeV
FCC-ee	TDR, pre-construction		Construction	Z W 240 GeV → 350 GeV		
HE-LHC	R&D, TDR, prototyping, pre-construction			Construction		27 TeV
FCC-hh	R&D, TDR, prototyping, pre-construction			Construction		100 TeV
Muon Collider	R&D, tests, TDR, prototyping, pre-construction			Construction		3 → 14 TeV
Plasma Coll.	R&D, feasibility studies, tests, TDR, prototyping, pre-construction				Construction	3 TeV