

PAUL SCHERRER INSTITUT



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Update on Porthos timeline

19 March 2021



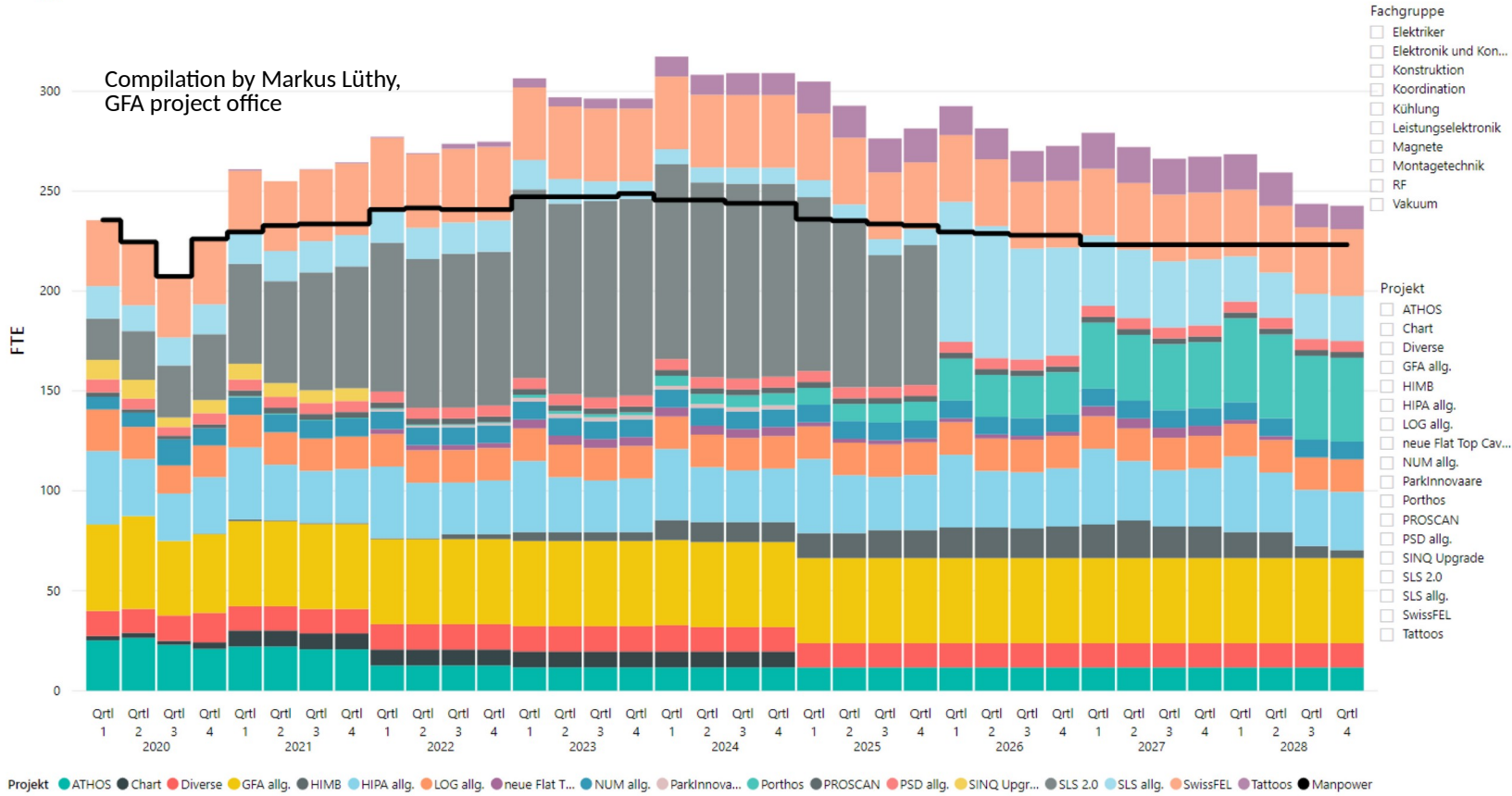
PSI projects for BFI roadmaps 2023 and 2027

- Extraordinary DIRK from 3 November 2020: two projects to be proposed for the BFI periods 2025–28 and 2029–32. Initial selection done, but prioritization needed between:
 - **HIMB/TATTOOS upgrade of HIPA**
 - **Porthos upgrade of SwissFEL**
- Boundary conditions:
 - Projects must be finished **on time** (max. 1 year after end of BFI period). Consolidate / commissioning later with internal funds.
 - PSI should only submit **one large project** per funding period.
 - In the next round (2025–28), ETH council determined to spend less than in previous periods: should only **ask for ~50 MCHF projects**, ~100+ MCHF projects must wait for later periods.
 - **Contribution / buy-in from PSI budget** (cash and in-kind labor) is expected.

PSI projects for BFI roadmaps 2023 and 2027

- Current situation at PSI (Ch. Rüegg, 19 February 2021):
 - **General delay** of about 2 years with respect to BFI periods due to COVID and other reasons.
 - **SLS-2.0** to be completed by 2026 (129 MCHF budget). We will likely receive additional 40–50 MCHF for beamline upgrades in 2027–28, resulting in corresponding work load.
 - At **SwissFEL** Maloja and Furka endstations to be completed by 2022. Cristallina and Diavolezza still pending. EEHG/HERO option for Athos to be installed and commissioned.
 - *Photon science groups extremely busy until at least 2028!*
(many GFA groups as well!)
 - Substantial investments in other infrastructure needed (campus renewal, Park InnovAARE)

Expected workload at PSI 2020–2028



PSI projects for BFI roadmaps 2023 and 2027

Director's decision and communication on 19 February 2021:

The fact that the (one) project we propose for 2025–28 has to:

- cost no more than about 50 MCHF,
- be realized essentially in parallel to SLS-2.0 construction and SwissFEL completion,

basically leaves no choice but to

- put **HIMB/TATTOOS on the roadmap for the BFI period 2025–28 (realization in 2027/28),**
- put **SwissFEL Porthos on the roadmap for the BFI period 2029–32 (realization in 2029/30).**

SwissFEL Porthos will still go on the 2023 roadmap, but with a target realization date of 2029/30.

What does it mean for Porthos?

- The good news is that **Porthos will be built!** (Just not by 2028...)
- Use the period 2025–28 for (substantial) **pre-project activities** (10 MCHF total?):
 - Injector upgrade? (4.1 MCHF)
 - 15 mm cryogenic APPLE-X development?
 - Photon detector developments?
- Complete **Conceptual Design Report by 2026?**
- Complete **Technical Design Report by 2028?**
- ...to be ready to **build Porthos in 2029–32!**
- Planning the construction of Porthos in the earlier part of the BFI period would leave some scheduling flexibility.



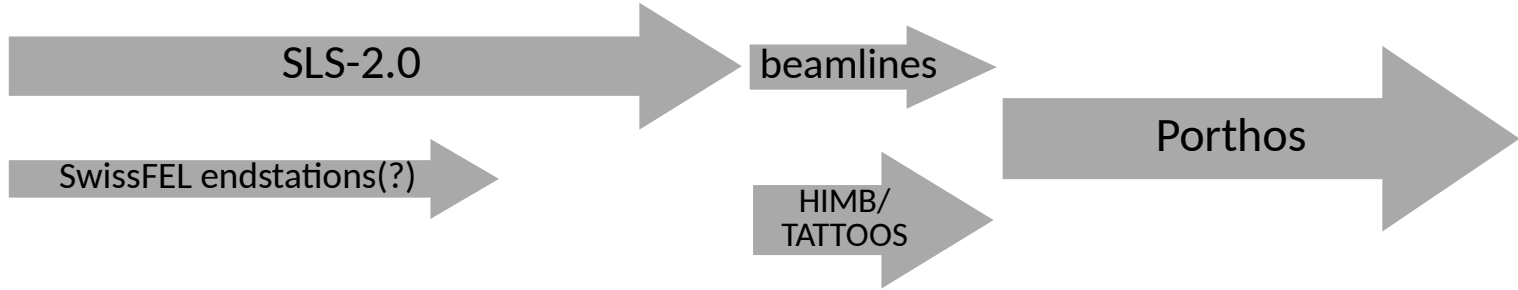
New Porthos timeline

BFI 2021-2024

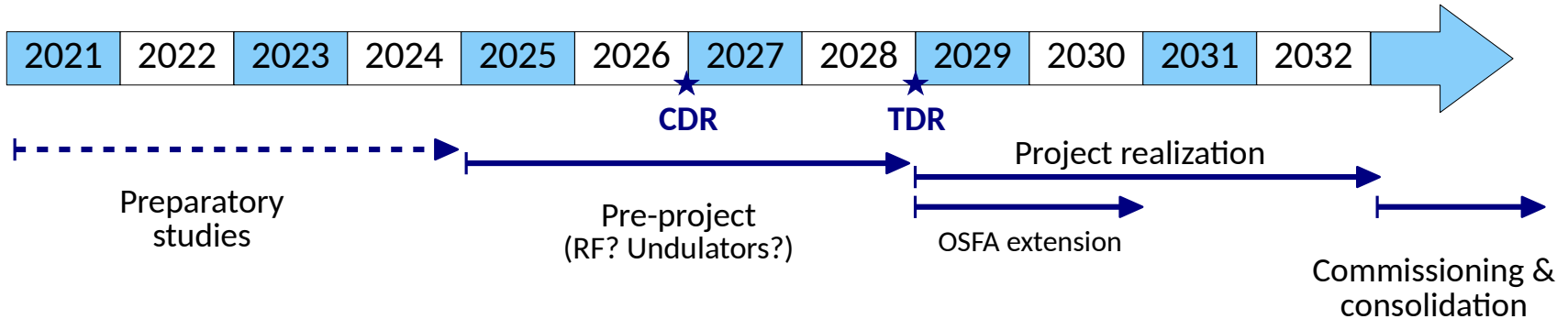
BFI 2025-2028

BFI 2029-2032

PSI projects



Porthos activities



New budget estimate, including RF upgrades

- Machine:
 - **Undulators:** 20 3-m Apple-X modules à 1 MCHF, add 100 kCHF each for cryogenics and interundulator stuff: $20 \times 1.2 \text{ MCHF} = \mathbf{24 \text{ MCHF}}$
 - **Cryogenic plant** for undulators: **2 MCHF**
 - New **gun laser lab** (incl. building extension): **6 MCHF**
 - **Kicker** upgrade and new kicker hardware: **2 MCHF**
 - **Diagnostics upgrades** for dealing with 21 ns bunch spacing: **2 MCHF**
 - **RF upgrade** (X-band & C-band stations, injector upgrades as a preproject?): **25 MCHF**
 - **Electron beamline components** (vacuum, diagnostics etc.): **4 MCHF**
 - **Machine total: 65 MCHF**
- **Front end and photon beam transport** (optics, monochromators, diagnostics etc.): **10 MCHF(?)**
- **End stations:** 10–15 MCHF per station – start with 1–2 stations? → **20 MCHF**
- **IT & controls** (general system upgrades and extensions): **5 MCHF**
- **Building extension:** 35–40 MCHF first estimate → **35 MCHF**

→ Porthos total: 135 MCHF

Possible split:

- **100 MCHF BFI dispatch**
- **35 MCHF PSI budget**

Next steps

- 19 March (today) **submission of two-page fact sheet for ETH council**
- 6 April 2021(?) Internal evaluation of proposed roadmap projects at PSI
- 21 April 2021 **ETH council meeting:** initial discussion of project ideas from different institutions.
- 27 April 2021 Presentation of working group findings at **SwissFEL Progress Meeting**
- early July 2021 **ETH closed session** (“Klausur”): in-depth discussion of projects
- September 2021 **Notification of SNF** on ETH projects planned for the '23 roadmap
- January 2022 **Submission of final requests to SNF for evaluation**

What about our working group?

- We should keep up the momentum, but may not have to meet once every month...
- Meetings every 2 months or every 3 months?
- Start work on a Conceptual Design Report...

Thank you

