

IKON15

Science Directorate Update

Andreas Schreyer
Director for Science
European Spallation Source

Overview



- General News from ESS
- Rebaselining
- Instruments 16-22
- IKON14 feedback, Future IKONs
- Instrument papers
- ESS – ILL User meeting

Highlights of ESS Goals and plan for 2018



In progress

- Submit to SSM the application for the trial operations of the Warm Linac
- Start of commissioning of ion source and LEBT, local control room operational
- Complete manufacturing and Factory Acceptance Tests of Moderator plug, Cryo-Moderator System and Cryoplant.
- All instruments start Tollgate 3 process and begun procurement
- Move ESS Lund organisation to site
- A detailed plan for first two years (2019 & 2020) of Initial Operations
- Secure Spain as an ERIC member and finalise all remaining in kind agreements (UK, DE...)
- First user meeting – joint with ILL
- Work with ILL and national sources to establish a neutron initiative recognised by the European commission in their planning for FP9

Sept

Oct 10-12

Kick-off
this week


Permanent
Office
Campus
2021



New 2018 ESS offices
for all staff

New Bus Stop

Lund Tramway Depot



Offices, auditorium
canteen



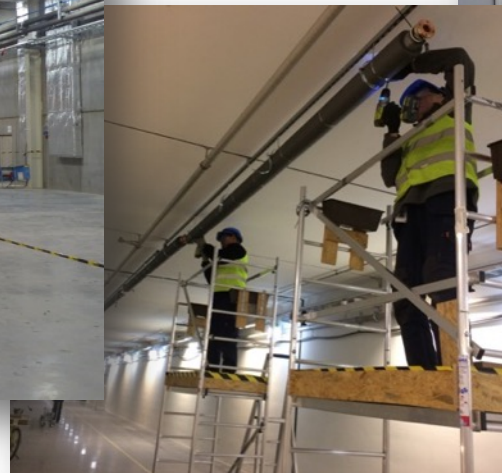
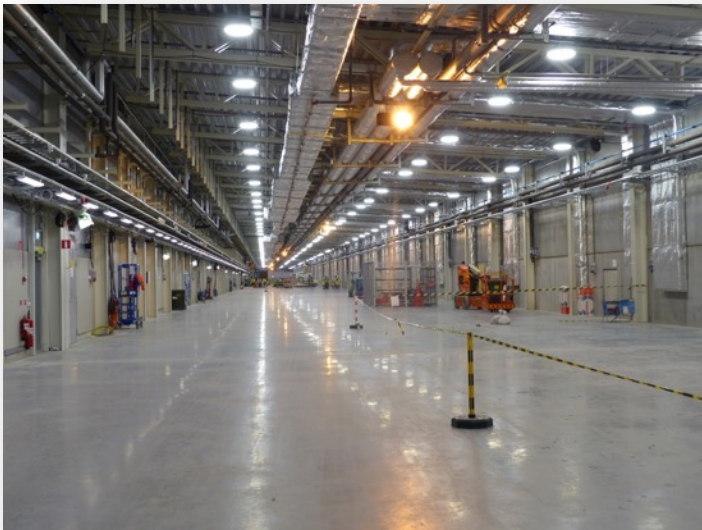
Labs and
Workshops

- Signed construction and financing agreements in February
- Now in detailed design before target cost is agreed
- Cost of the lease is included in the operations costs

Entrance
Building

ESS is roughly 45% complete

- 2018 is the peak of construction activity
- First buildings have been handed over
- In-kind deliveries of high tech equipment arriving
- All staff moved out to site



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All Helium cryoplants
are installed and
under commissioning

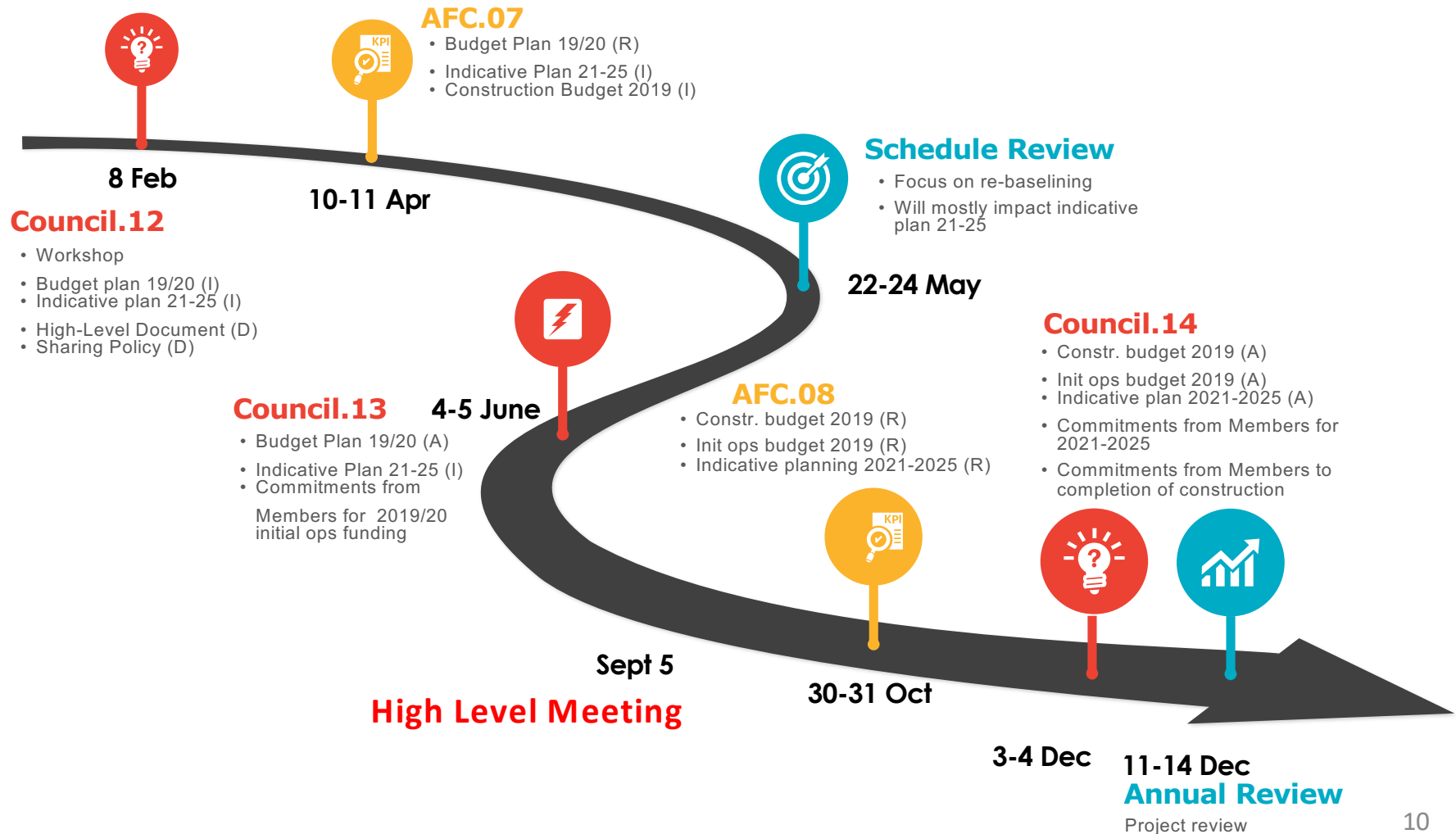


All 19 Helium storage tanks are installed

The temporary control room is operational



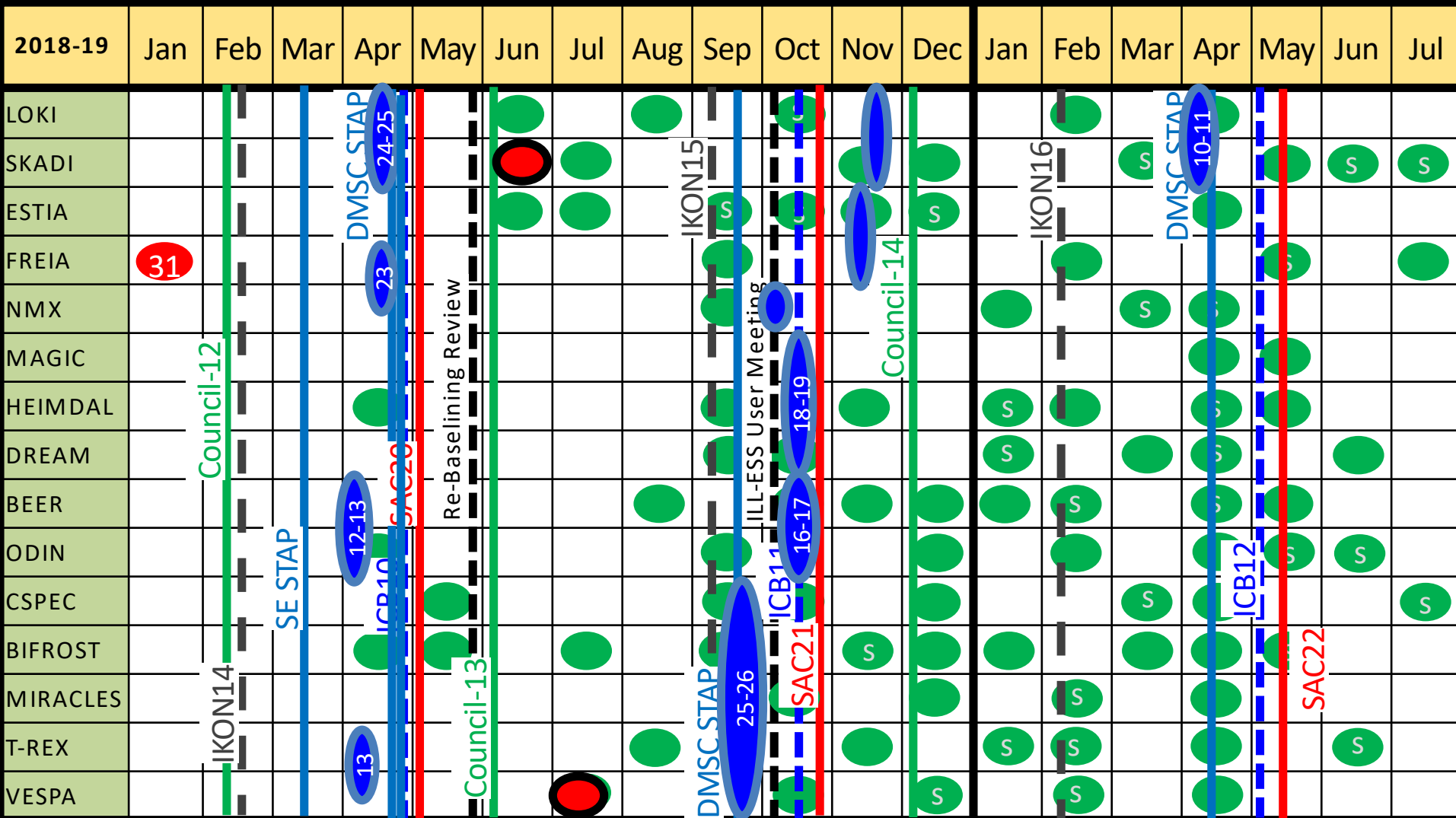
Funding decisions in 2018






ESS Council Meeting June 4-5

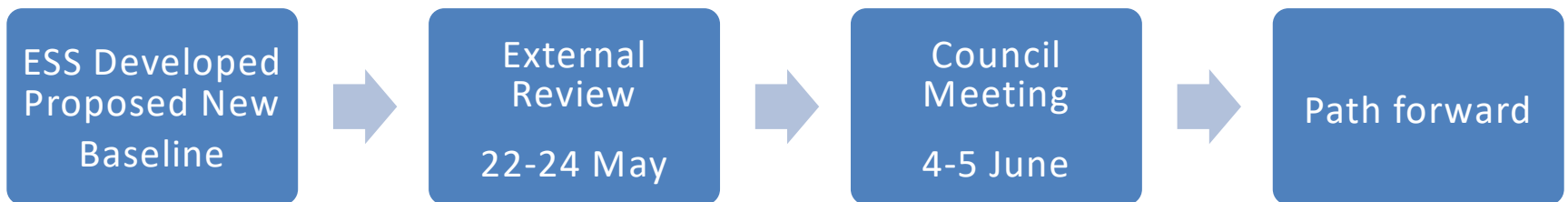
- Initial Operations budgets agreed for 2019 and 2020
- Political process ongoing
 - High level meeting Sept. 5th
 - Good progress on additional funding to make up for the missing contributions (5.7%) and the extra costs for the additional earthquake requirements (Fukushima) and additional security requirements.
- Rebaselined schedule agreed as the appropriate planning basis for ESS
 - More details below

Science Directorate Calendar



 STAP
   TG2 ongoing/passed
   TG3 intermediate/final

Implementing new ESS Construction Project baseline plan



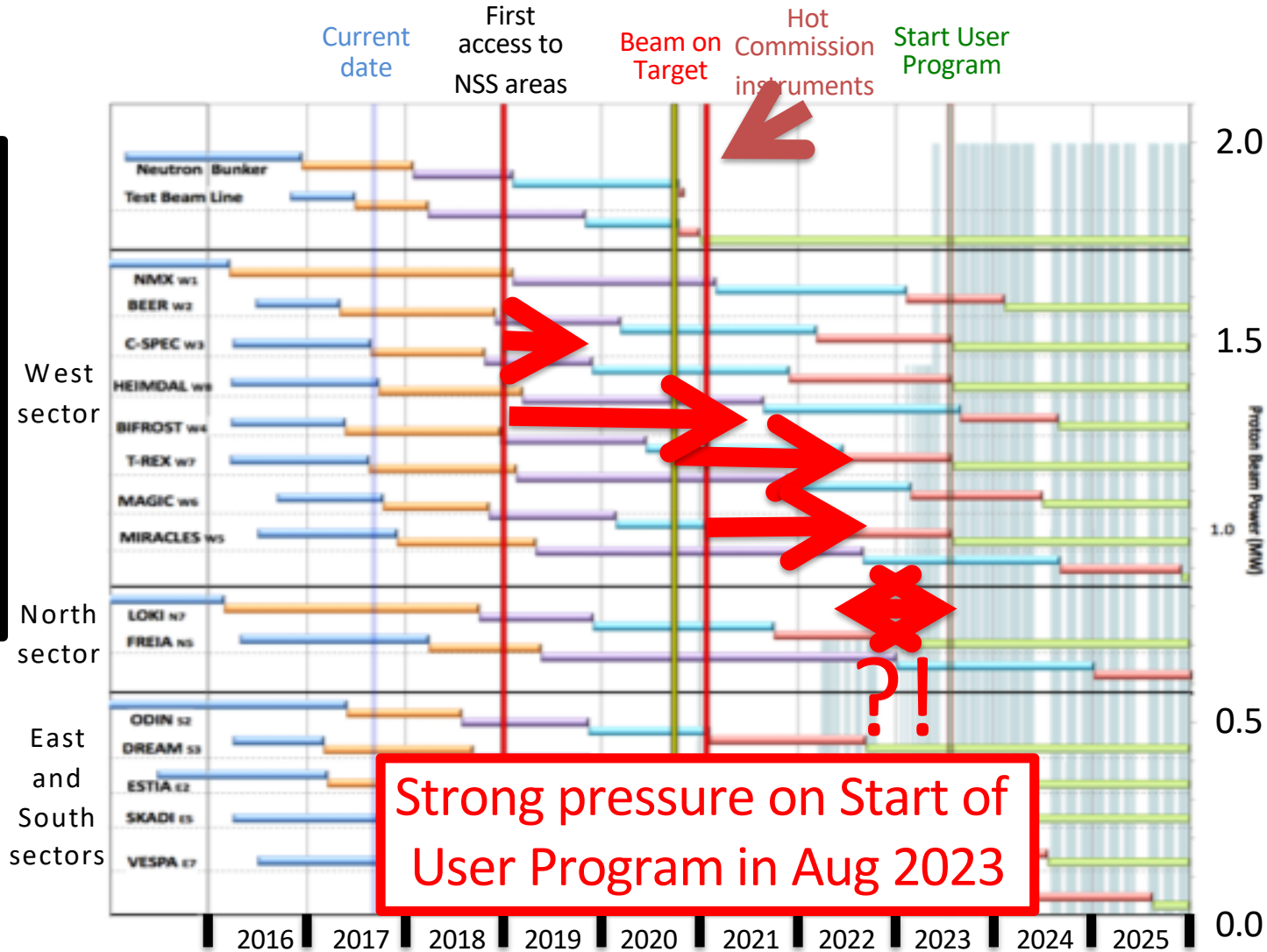
Internal* Neutron Beam Instrument Schedule

DRAFT FOR DISCUSSION V3.4, 15th September 2017

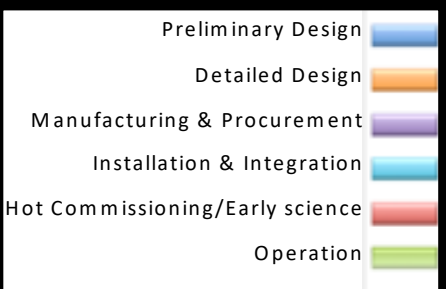
* still under discussion with ESS-ERIC Council

NOTES:

- Assumes 2MW maximum power until end 2025
- Phases aligned with TG2 reviews on 1st 10 NBIs
- Installation & Integration (TG4) + Hot Commissioning (TG5) for first 8 NBIs aligned with draft BOI plan (*schedule match typically within 1 month*)



Strong pressure on Start of User Program in Aug 2023



Input collected at Council strategy workshop in Feb. 2018 on rebaselining

- December instead of August 2023 OK.
- Some want to protect the year 2023, others less so.
- Eight instruments not necessary – fewer, well chosen ones is acceptable.
- Work-horse instruments with good odds to deliver science early (Powder Diffraction, Imaging,...).
- Instrument selection is management decision.
- The initial user program can start with experienced users, producing results as a part of late commissioning.
- Important to have a transparent selection process

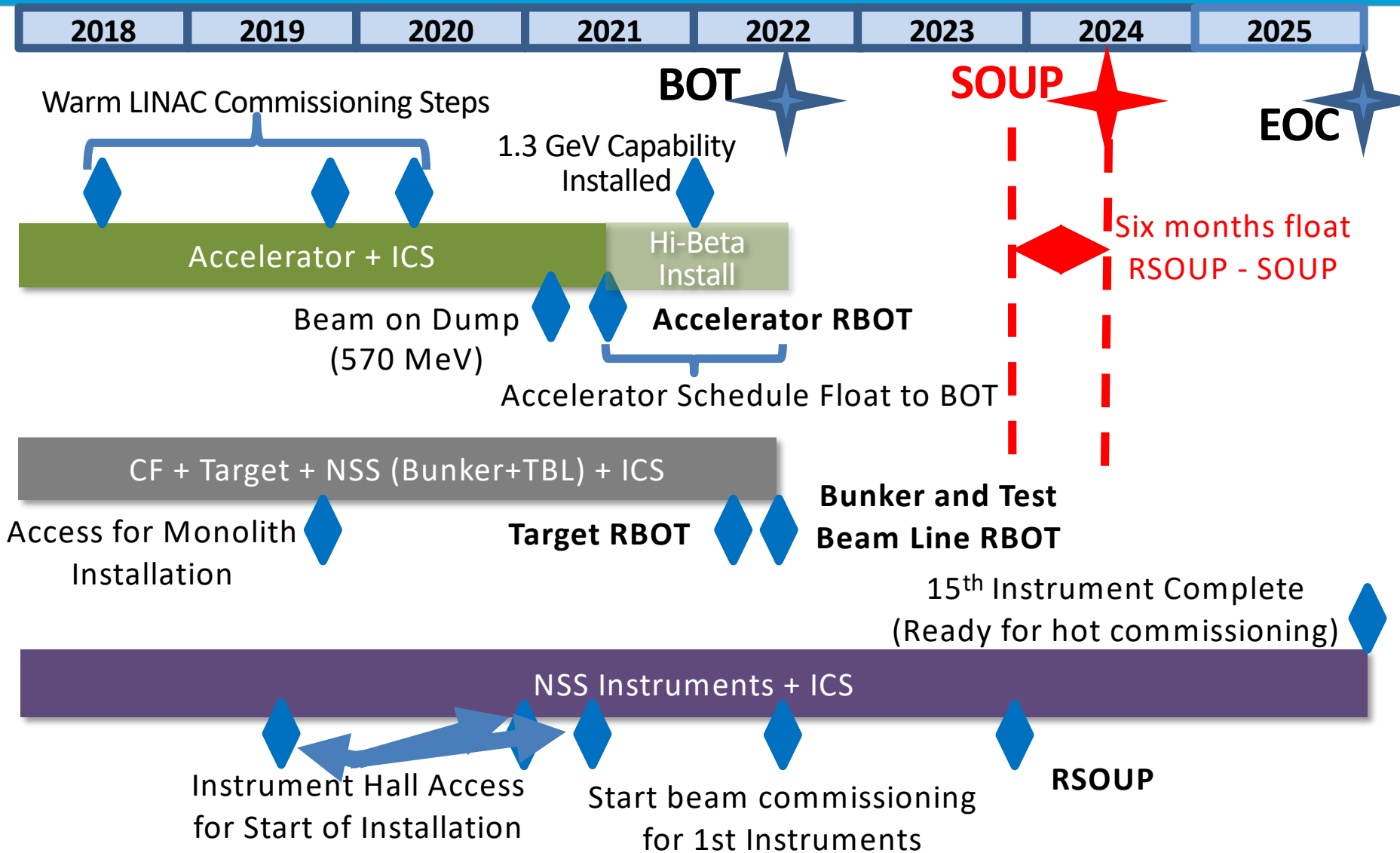
Strategy to maximise early science

- Try to keep “Ready for Start of User Operation” (RSOUP) in 2023 (Dec., **no float**)
- Start of User Operation (SOUP) with less instruments (3)
- There will be more than three options, select these three when reality is known better (March 2023), focus on “workhorses”
- Start user operation of the remaining 5 (of the first 8) instruments asap (2024)
- Commission about 4 instruments per year from 2023-2026 (challenging but not unrealistic)
- Start hot commissioning of instrument 15 by end of 2025 (end of construction), user operation in 2026.
- End of construction would still be in 2025 (determines duration of initial operation phase)
- As a consequence instruments 16-22 should also be delayed (by about one year), due to long lead times selection process should start soon. Ramp up to 5 MW also affected.

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- Com **proposed to add 6 months float**
- (challenging but not unrealistic)
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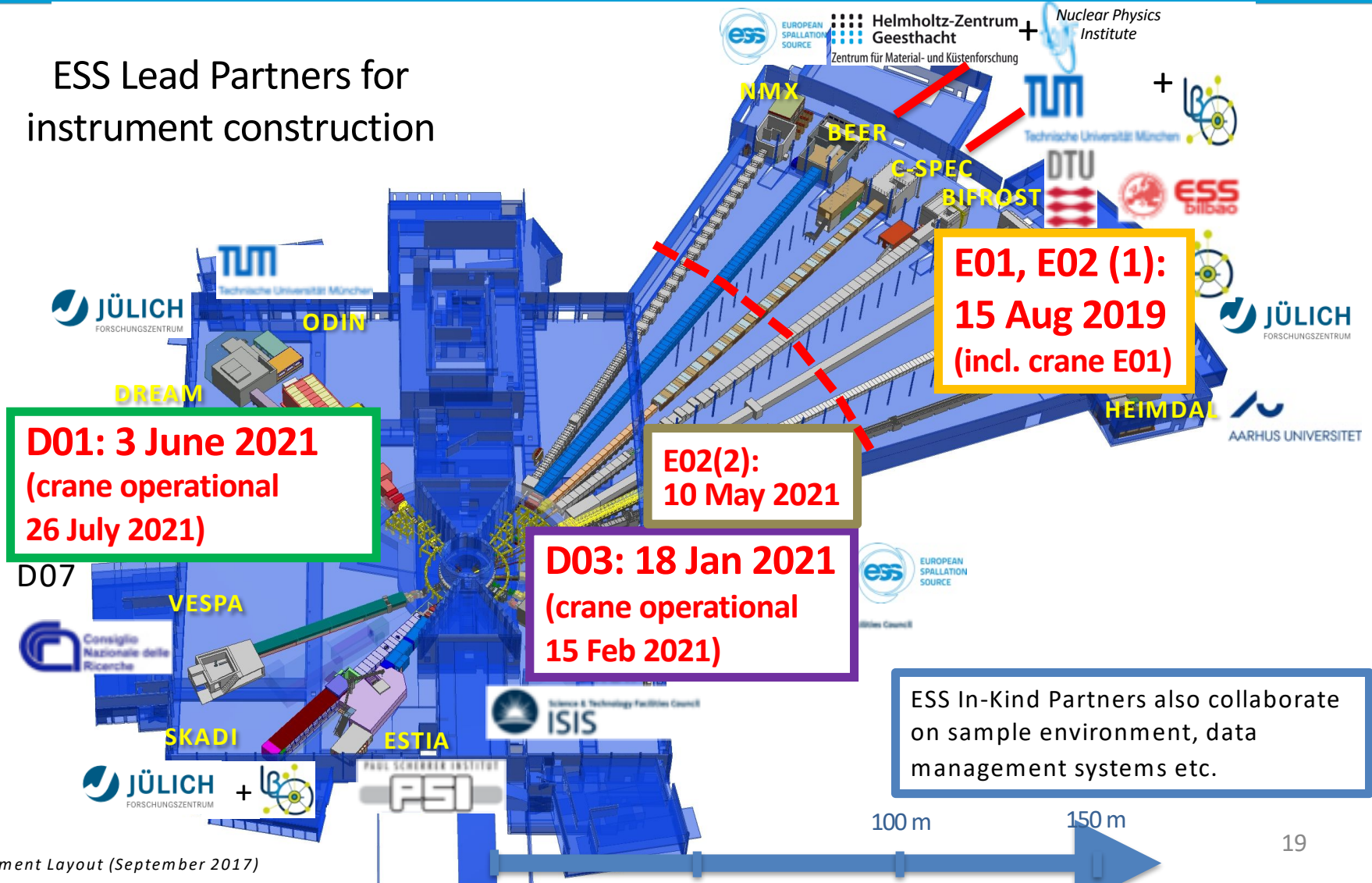
Summary Schedule for Remaining Work - 2 ½ year delay in BOT, but only 4 month delay in SOUP (with no float)



ESS Neutron Instruments 1-15 + test beamline

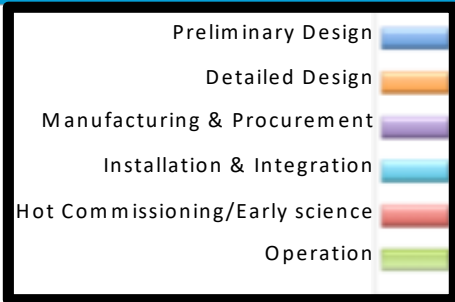
First access dates for Instrument Installation

ESS Lead Partners for instrument construction



Proposed rebaseline schedule for Neutron Beam Instruments (V4.0, 11th May 2018)

from Installation workshop with teams building first 8 Instruments (8th May)

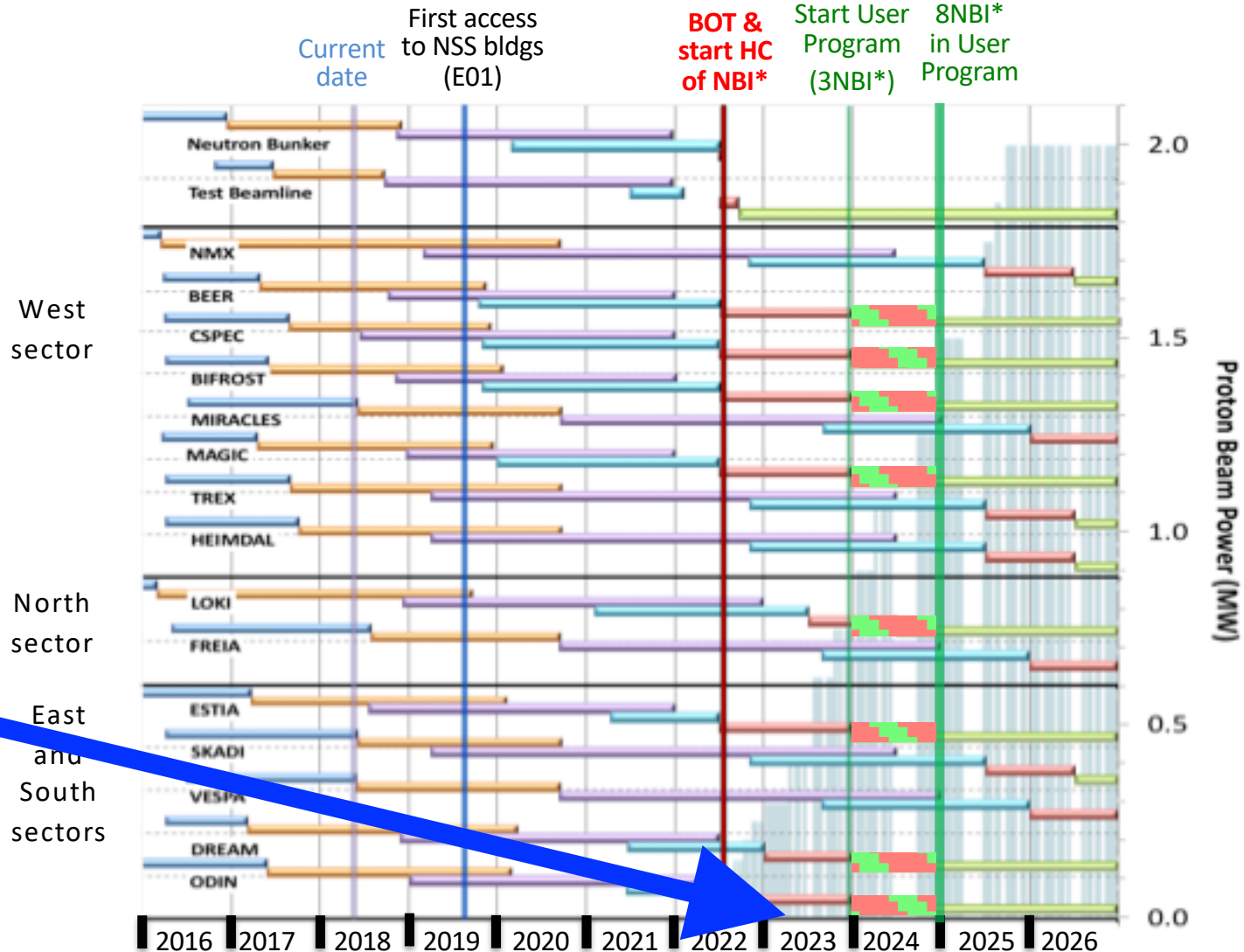


Safest instrument choices to be Ready for SOUP in West sector (BEER, CSPEC, BIFROST & MAGIC) & East (ESTIA)

Most desirable instrument choices for early science highlights are in the South and North (ODIN, DREAM & LOKI).

Selection of first NBI for SOUP in March 2023

Knock-on delays to NBI: 9 – 15 of ~ 1 yr and 16 – 22 of ~ 1 ½ yr



* NBI = Neutron Beam Instrument

Thorough review of proposed new baseline held on 22-24 May



- *Panel of 10 external experts*
- *“The review committee was duly impressed by ESS’ excellent progress toward delivering the most powerful neutron source facility in the world,” said review committee chairman, Mark Reichanadter. “The revised schedule is well thought out and based on sound methodology, the results of which the committee endorses.”*
- 46 recommendations: developed responses for each

- Working with the ESS Council, ESS Management should develop a tiered instrument commissioning schedule which will achieve meaningful science (to be defined) starting six months after BOT. Definitions of the interim user-related commissioning milestones should be clearly defined (i.e., Early Science, User-Assisted Commissioning), which lead up to the full SOUP. The commissioning schedule can be incorporated in the ESS baseline when completed. This recommendation would preclude the need to move the SOUP milestone to June 2024 at this time.

ESS Reply presented in Council: Start of User Programme



Propose to follow the recommendations of the panel and

- manage aggressively to the current schedule which defines SOUP as the start of a **full, peer-reviewed-access user programme with three fully commissioned instruments by December 2023**
- note there is no float in this date, but rather than adding additional float now, we propose **at a future date to scale back the definition of SOUP if needed.**
 - The modified definition would keep the same date but reduce the level of commissioning promised:
 - Open three instruments to users by December 2023, but allow that the users may be ‘experienced users,’ and allow that the instruments may not have all capabilities fully commissioned

ESS Reply presented in Council: Beam on Target



Propose to follow the recommendations of the panel and

- manage aggressively to the current schedule which foresees **beam on target by mid-2022**
- note there is no float in this date, but rather than adding additional float now, we propose to *report continuously to Council and update this milestone if it becomes not fully credible as a deliverable target*

ESS Reply presented in Council: Start of user commissioning

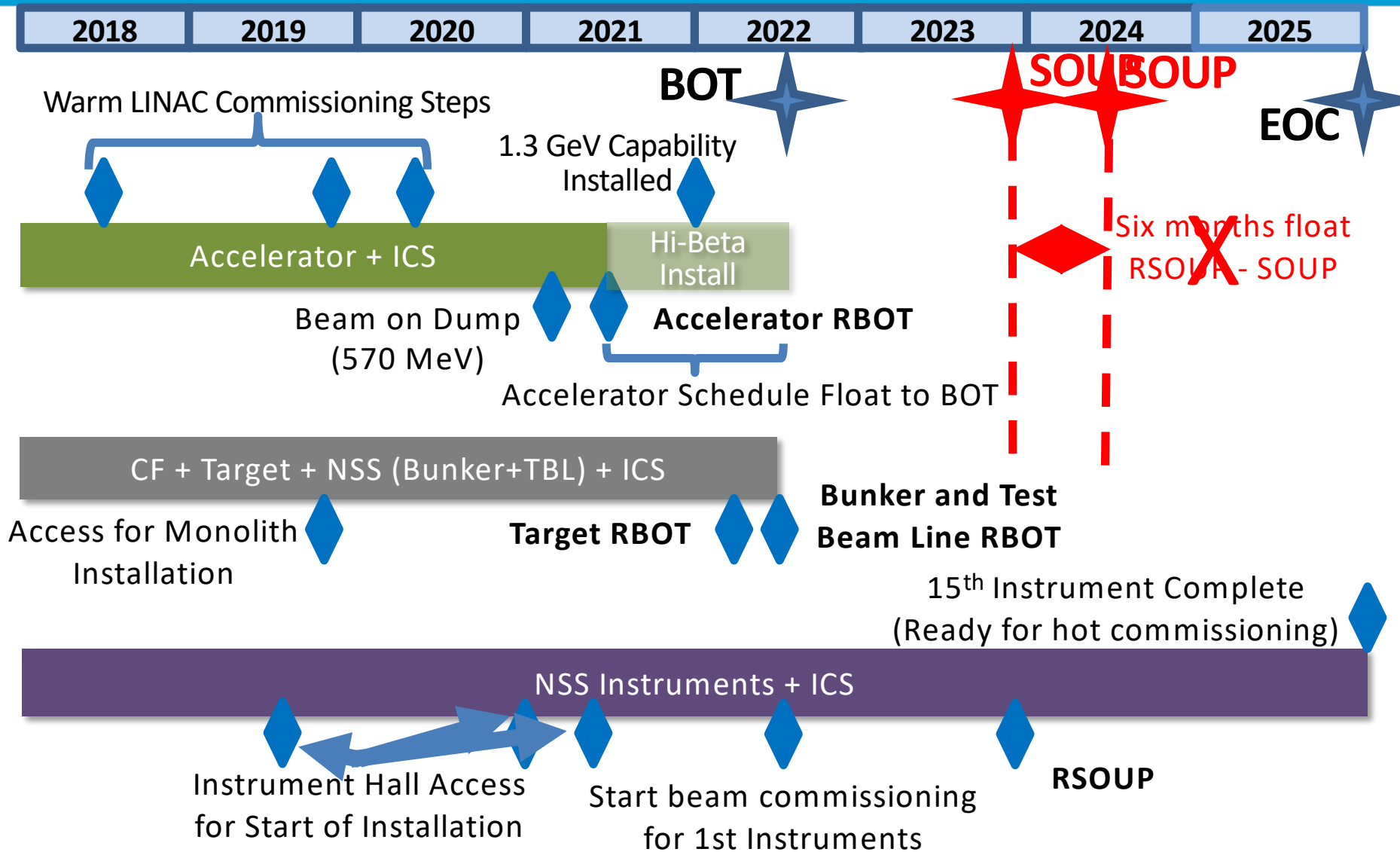


- Management also suggests we follow the spirit of the recommendation to develop an additional, externally communicated plan for the **start of early science** involving the SAC based on the early science success strategy communicated to Council
- Early science would come maybe 6 months after BOT, i.e. **early 2023** (zero float) for the first instruments assuming that accelerator and target commissioning goes well
- ESS will work hard to align the activities of accelerator, target and NSS to ensure early science highlights
 - *Again report progress continuously to Council*

Path forward

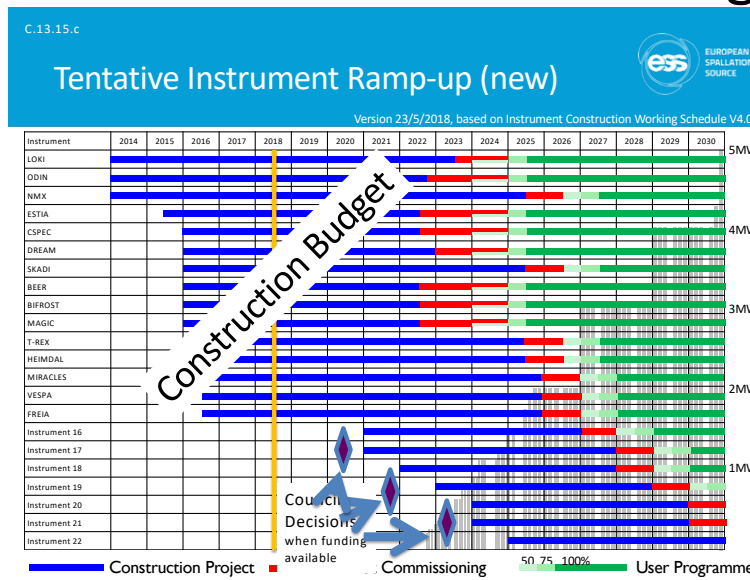
- Fully implement baseline and use for reporting
- Based on review panel and Council input we will not add float to key milestones, but
 - Could scale back SOUP definition if needed to keep it in 2023
 - E.g., use ‘experienced users’ without all instrument capabilities fully commissioned
 - Report progress relative to BOT continuously to Council and revise date if it becomes an unrealistic goal

Summary Schedule for Remaining Work - 2 ½ year delay in BOT, but only 4 month delay in SOUP (with no float)



Instruments 16-22

- No call for instruments 16-22 in 2018
- Based on SAC suggestion Council has asked the Science Directorate to develop a publicly available capability-gap analysis document.
- Document will be made available widely (website):
 - Will be discussed at ILL-ESS user meeting in October 2018



IKON14 feedback

- 3 Parallel Sessions = good number >> We have kept the formula, no more than 3 sessions or workshops at the same time
- Less focus on download from ESS and less overlap between talks >> There will be only three ESS plenary talks balanced by three talks from the instrument teams and the workshop structure should warrant less download and more exchange
- Bunker – what is happening? >> This time the Bunker project will report both in a plenary talk and in a parallel session
- What would really help the teams: other instruments show details of their design to the others >> There should be many occasion for this kind of exchange during the week: three plenary instrument talks, ad hoc meetings, meetings on many key components. Spending a whole week together should provide room for such interactions...
- The planning should be discussed in face to face meetings and not in big assembly like we had >> Planning will be discussed in workshops
- Also, we have tried to cover most of the “hot topics” that were mentioned in the IKON14 feedback session as relevant for IKON15

February IKONs?

- Recent 4 years: February IKONs hosted by in-kind partners
- ISIS , JÜLICH, PSI and LLB
- More and more instrument teams will be setting up in Lund
- Instrument installation will start in E-buildings next year
- Proposal: Hold all IKONS in Lund ?
- Feedback to me

Instrument papers

- Single long paper for all instruments
 - agreement to submit to Nucl. Instrum. Meth. A
 - all instruments have written their part – harmonization ongoing
 - For discussion in instrument class sessions
 - introductory sections to each instrument class are being written by the instrument class coordinators – harmonization ongoing
 - overall introduction to be written by Andreas/Shane/Ken/Dimitri
 - aim for next draft by November
- Individual instrument papers
 - to be timed roughly with TG3 of each instrument
 - preliminary discussions on paper format – some divergence of opinion exists
 - several journals contacted – all agree to publish virtual issue
 - journal decision to be made before first paper
 - agreement that the journal needs to be included in the WoS database

ILL – ESS European Neutron User meeting



- Methodological focus: user feedback on
 - ILL New instruments Endurance 2 and
 - ESS Instruments: Next 7 / Completions / Suite 15 / First 8.
- Include several satellite events with scientific focus.
- Start series of joint 'ILL / ESS European Neutron User Meeting'.
 - Periodicity every 2 years (even years e/o ECNS / ICNS);
 - Location to oscillate between ILL / ESS.
- This Year
 - 10 – 12 Oct. 2018
 - WTC Grenoble, France
 - 200 + 100 participants
- More Details: Neutrons4Europe.com



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 - Location to oscillate between ILL and ESS
- This Year
 - 1000 participants
- More Details: Neutrons4Europe.com

Registration closed since maximum of 500 registrants has been reached



- Good project progress
- Moved up to site!
- Rebaselining completed
- Council has strong interest in the selection of the first three instruments at SOUP and in the backup solutions for these
- Early Science during hot commissioning (6 months after BOT) will be a hot topic, instrument teams need to be aware of that
- High level discussions on the initial operations and the missing funding for construction future of ESS have progressed
- Instruments 16-22: Gap Analysis
- ESS-ILL User meeting Oct 10-12, 2018
- Further progress on contracts and TAs is needed
- Proposal: All IKONS in Lund ?