

Addendum to
The European Spallation Source neutrino Super Beam ESSvSB

1. Interested community

The interested community active in the ESSvSB project is composed of more than 70 physicists of the 17 ESSvSB groups at the following institutions:

Centre National de la Recherche Scientifique at IPHC (Strasbourg) and at IPNO (Orsay), France
Cukurova University, Adana, Turkey
Demokritos Center, Athens, Greece
European Organisation for Nuclear Research, Geneva, Switzerland
European Spallation Source, Lund, Sweden
Istituto Nazionale di Fisica Nucleare (INFN) at Milano and at Padova, Italy
Lund University, Sweden
Royal Institute of Technology, Stockholm, Sweden,
Rudjer Boskovic Institute, Zagreb, Croatia
Sofia University St. Kliment Ohridski, Sofia, Bulgaria
Universidad Autonoma de Madrid, Spain
University of Durham, UK
University of Geneva, Switzerland
University of Science and Technology, Krakow, Poland
Uppsala University, Sweden

2. Timeline

The COST Action EuroNuNet is supporting our project from 2016 to 2019. The EU H2020 supported ESSvSB Design Study, which started in 2018 and will last up to end of 2021, will result in a Conceptual Design Report by 2021. The design work will continue with a Technical Design Study resulting in a Technical Design report by 2024. The length of the overall ESSvSB construction period is determined by the time it will take to construct the Far Detector and is foreseen to be 7 years.

As it is difficult to foresee how the international research-infrastructure funding situation and the progress of neutrino physics will develop over the next 6-8 years it is a challenging task to estimate how long time it will take to achieve an international agreement between governments on contributions to the investment budget such that all foreseeable construction costs can be covered and the build-up of ESSvSB started. Our estimate is that it will be possible to start the build-up of the ESSvSB at the ESS site and that of the Far Detector at its site sometime in the period 2026 to 2029 and to start data taking sometime in the period from 2033 to 2036.

3. Construction and operation costs

One of the important tasks of the ongoing Conceptual Design Study is to make a first approximate estimate of the ESSvSB construction costs by 2021. The Technical Design Study should deliver a solidly based and detailed estimate of the same by 2024. Below we give our current very preliminary cost estimate, which we consider to have an accuracy of +-30%:

Linac upgrade	230 MEUR
Accumulator ring	150 MEUR
Target Station	170 MEUR
Near and Far Detector	750 MEUR

SUM	1300 MEUR

Based on the experience of existing large research infrastructures we estimate that the yearly operations costs for ESSvSB will be approximately 5% of the investment cost, which thus implies the estimated cost for operating the equipment at the ESS site and at the Far Detector site to be of the order of 65 MEUR/year.

4. Computing requirements

The production of raw data is very approximately foreseen to be of the order of several tens of TBytes/day. In view of the very rapid development of computing it is very difficult at this stage to make an estimate of our computing requirements for ESSvSB once in operation.