

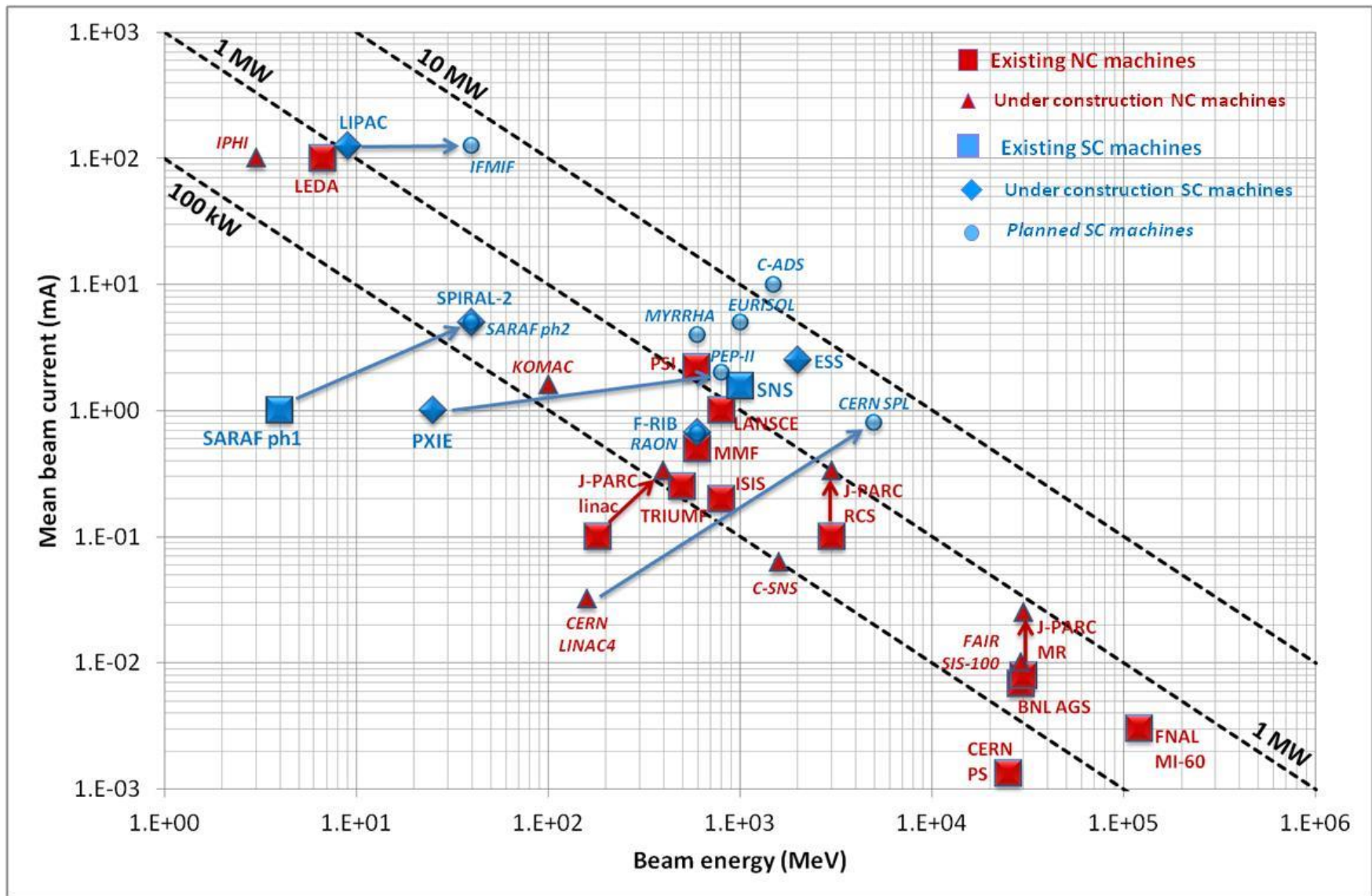
Energy session: discussion topics

# Main challenges

- Beam power levels
- Accelerator reliability requirements
- More generally, lack of clear view on the future of nuclear energy (at least in Europe...)

# Beam power levels

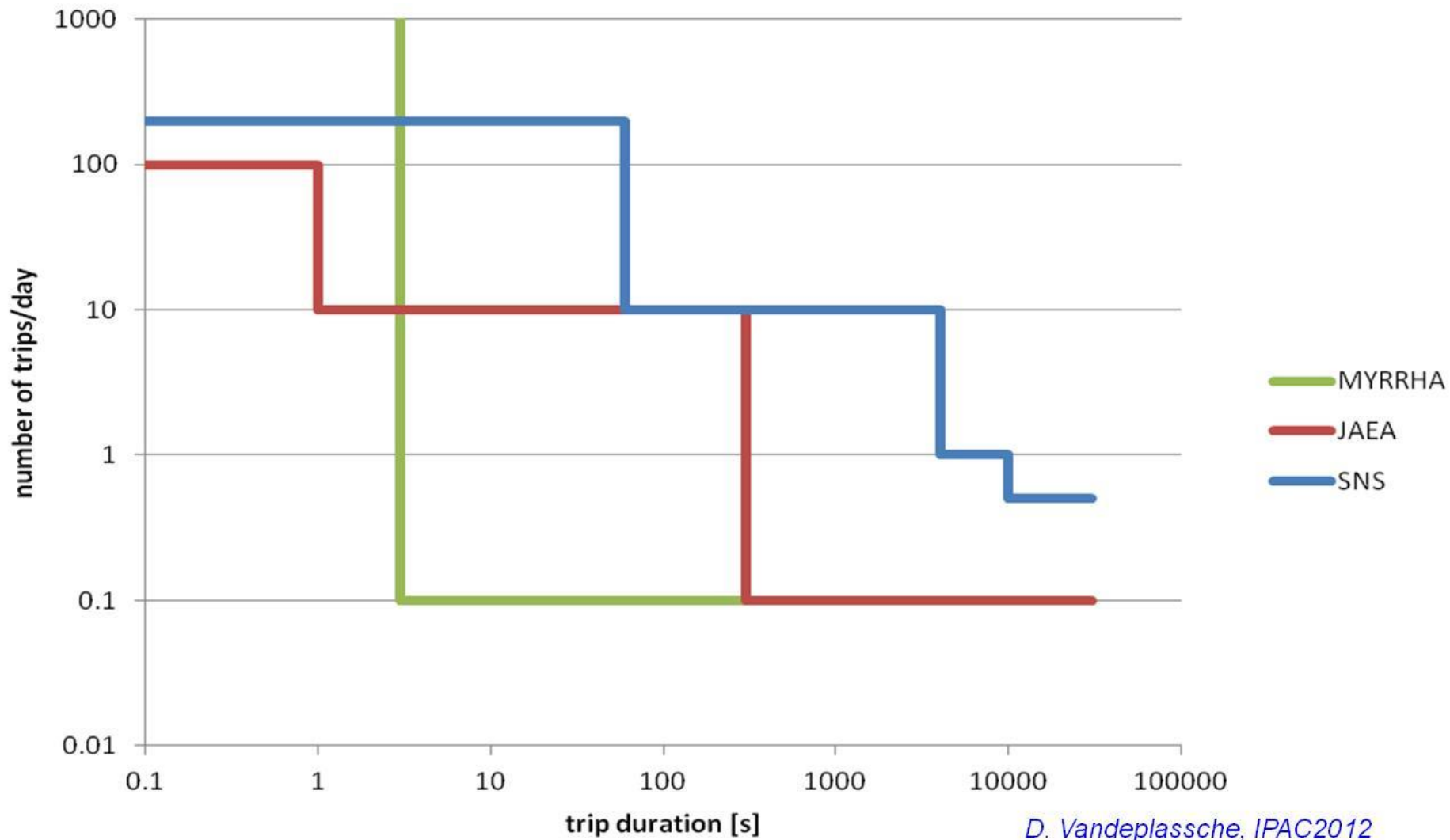
- Multi-MW hadron beams
  - Demo LIPAC: 1.1 MW
  - IFMIF: 5 MW
  - MYRRHA: 2.4 MW
- State of the art is 1.3MW (PSI, SNS)
- Adequate present technology for HP proton linac is SRF
  - ESS is now under construction @5MW
- Main challenges
  - High beam current production/transport
  - Low-loss machine operation (low activation for maintenance)
  - High Power components (RF, beam instrumentation...)
  - Machine protection
  - Energy efficiency
- Up to which power level in the future using these technologies ?
- What will the future needs? 10-100 MW for ADS?



Non exhaustive plot !

# Reliability requirement

- 250h MTBF for Myrrha
  - 2/3 orders of magnitude higher than state-of-the-art
- Induced extra-cost & extra-complexity is high
  - Redundant systems
  - New generation innovative control systems
  - A lot of additional R&D is needed in general
- Justification for such a requirement is to be reinforced
  - Could this requirement be relaxed? Cf Chinese-ADS
  - What to expect for industrial ADS?



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# Future of nuclear energy

- Fusion
  - ITER
  - DEMO, Post DEMO ???
- Fusion
  - Gen IV
  - Transmutation & ADS??
- Politics/support
  - Euratom is (one of the only?) clear support
  - Several different national policies/flavours on these issues... NO CONSENSUS presently