

Eco-system aspects:

Considerations are short-term (1-3 years), medium term (3-5 years) and longer term (5-10 years)

Short term is mainly about optimising use of the existing HPC facilities and access mechanisms

Medium term is providing input about requirements for next-generation systems

Longer term is preparing for exascale

Infrastructure provider challenges:

Disconnect between national infrastructure funding (for HPC, data, HTC etc.) and between EC funded infrastructure projects

Services sometimes provided by the same providers, but not always

European infrastructure is based on national funding which means national requirements are paramount (systems purchased compromise to make them as general purpose as possible e.g. PRACE Tier-0 provision based on fractions of national systems). Systems are configured for general purpose science throughput based on national users' job profiles e.g. queuing policies, systems software

Systems are procured on the basis of Linpack performance – pressure from governments and EC to have machines that are high up in Top 500.

Climate and weather challenges for HPC ecosystem:

Complexity of models (and coupling/workflows)

Size (and age) of many codes

Memory and IO challenges

Data requirements

Climate community is arguably an outlier.

Topical versus general purpose machines

Expertise e.g. DKRZ has far more expertise in data management than any general purpose HPC centre

Tier-0 project access was conceived for science that requires a large number of cores, not just a large number of cycles (the view that it is possible to run on smaller clusters)

Possible areas for action:

Closer partnership between community and infrastructure providers

Climate and weather are well-organised and coherent

Science case is not just about making the case for HPC – also about the way systems are configured and operated

Closer partnerships between infrastructure providers e.g. EUDAT/PRACE working together with ENES

Prototyping – PRACE PCP prototypes, Mont Blanc prototype, eventually extreme scale demonstrators – engage effectively with climate community and/or CoE (support will be minimal) Necessary in view of the very long development times for new codes.

PRACE Scientific Steering Committee to come up with strategies to support programmatic access

Peer review could then be internal to the community.

Is priority Incremental or more risky science?

Possible funding considerations:

Joint machine funding and purchase with a national provider e.g. CINECA/Fusion, Julich/Human Brain

European consortium machine(s) rather than fractions of national systems – would make it easier to focus on areas of socio-economic European interest

Co-funding of people and cycles in projects – budget to “spend” on buying a fraction of a system’s cycles

Industry engagement – weather and climate research are of key interest to many industry sectors – is this a funding opportunity?

Better outreach on economic impact of weather and climate research e.g. what do higher resolution models mean for the man in the street?