Lessons learned from interactions with vendors

1. Discussion with vendors are necessary and useful for both sides
   - These discussions happen on several levels between (IS)-ENES partners also outside IS-ENES
   - However, projects like IS-ENES and “official” bodies like the HPC-TF can provide a forum to have coordinated and thus more efficient and visible information exchange

2. Vendors are interested in having climate (and weather) applications as showcases
   - For the HPC branches of the vendors climate and weather are **key markets**
   - However, **HPC has to follow other markets** (it’s not big enough in itself)
   - HPC companies become integrators of technologies driven by other markets

Lessons learned from interactions with vendors

3. The free lunch **is** over
   - Computers are becoming broader not faster
   - Computers are becoming still more complex
     - Different components on a chip:
     - CPU + Accelerator + FPGA + ….
     - Memory hierarchy on a chip, export memory to SSD, …
   - Decrease of Investment costs for new systems might flatten out
     - In terms of Usable Flops per Byte per Watt
     - We might be able to make use of systems for longer !

4. Potential for “Co-design” is limited but there is some

Co-design …

- Chances to influence HW-development are very limited.
  - our market share is to small
  - there are technical limitations.

Co-design …

- We might influence system configuration …
  - Extreme Scale Demonstrator (ESD) projects: User requirements should influence design decisions
  - Better choice of functional units / components on a chip ?
    - CPU, GPGPU, FPGA, Size AND type Types of memory, Memory hierarchies, NICs ….
  - Need to have / provide good benchmarks

- … and software stack:
  - Fortran statements asked for by HPC-TF and provided by some vendors
  - potential Grid Tools support by NVIDIA
  - ACME being one (the first?) application driving Coral configuration
  - again ESD
  - ….

Co-design …

- We need to inform domain scientists to help them ask science questions that can be solved with available HPC environment
  - high res vs low res vs ensembles vs data analysis vs …
  - e.g. computability of EPECC type simulations -> ESiWACE