

DE LA RECHERCHE À L'INDUSTRIE

cea

[www.cea.fr](http://www.cea.fr)

# Energy Efficient HPC Working Group

## BOF@ISC13

Dr. Jean-Philippe Nominé

[jean-philippe.nomine@cea.fr](mailto:jean-philippe.nomine@cea.fr)



FROM RESEARCH TO INDUSTRY

cea

JUNE 2013



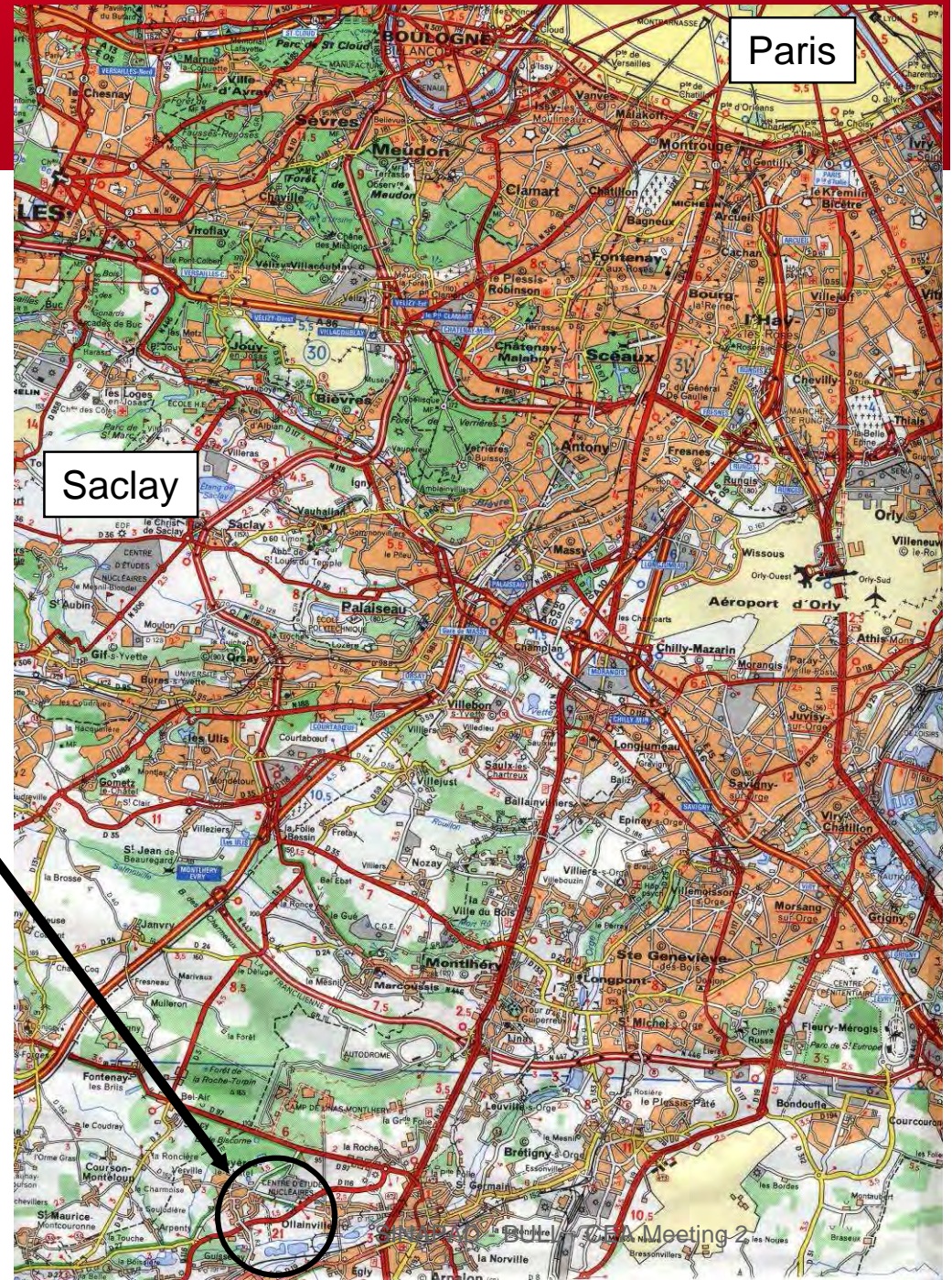
CEA/DIF (Bruyères-Le-Châtel)



CEA Supercomputing Complex



TERA100	Defence	1.25 PF
CURIE	Research	2 PF
AIRAIN	Industry	200+ TF







### TERA (defense activities)

Building power capability : 10 MW

Building cooling capability : 7.5 MW

#### 2005 : TERA10

Computing power : 60 Tflops – 1,4 MW (IT)

Air cooling : 5 to 8 kW / rack

#### 2010 : TERA100

Computing power : 1.25 Pflops – 4 MW (IT)

Water cooling : 30 kW / rack



### Très Grand Centre de Calcul – TGCC

Building power capability : 15 MW

Building cooling capability : 10 MW

#### TIER0 – PRACE (French node)

2011 : Curie supercomputer

Computing power : 2 Pflops – 2 MW (IT)

Water cooling : 30 to 40 kW / rack

#### CCRT-C (French research and industrial partners)

2012 : Airain supercomputer

Computing power : 200 Tflops – 200 MW (IT)

Water cooling : 30 to 40 kW / rack



# TERA FACILITY (TERA 100 SUPERCOMPUTER)

European Code of Conduct  
Data Centres Award 2013

Combined approach:

- UltraCapacitors # UPS
- Water-cooled racks
- Monitoring

Saving ca. 1 MW and 600 k€/year



- We jumped in the bandwagon in 2012...
- First supportive observers
- **Becoming more active in 2013**
  - CURIE power figure updated June 2013 – using EE HPC WG L1 methodology ( - 5%)
  - L2 not applicable this time = one measurement per run only
  - L3: more severe constraints, e.g.:
    - Direct energy measurement whereas for the time being we sample power every second and integrate
    - Shared infrastructure (UPSs), difficulty to separate from other systems (stop them?.....)





Commissariat à l'énergie atomique et aux énergies alternatives

CEA/DAM-Ile de France  
Département des Sciences de la  
Simulation et de l'Information

Etablissement public à caractère industriel et commercial | RCS Paris B 775 685 019