

The Notur Experience



NOTUR



The Consortium:



NTNU,



UiO,



UiB,



UiT,



met.no,



SINTEF,



Statoil,



Ceetron ASA

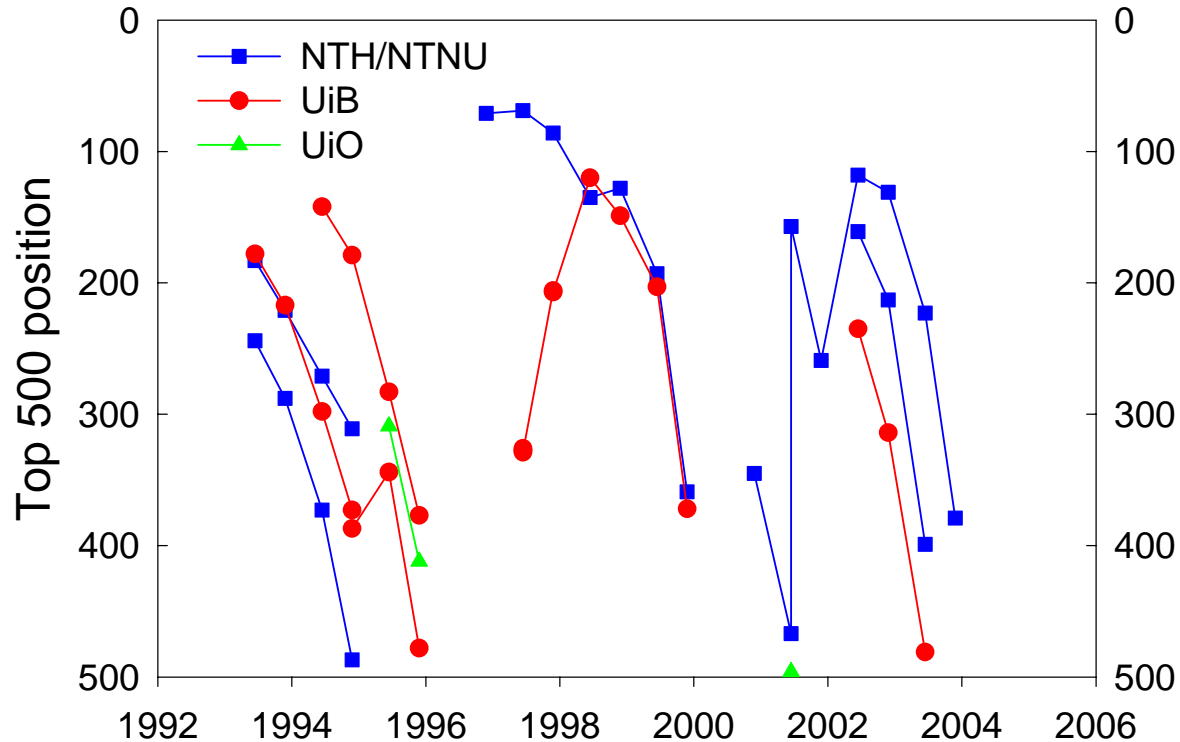
Purposes of Notur2004 (an OD activity)

- Gather HPC-people (this is the 4th gathering)
- Summarize project achievements
- Get news and inspiration from abroad
- Look to the future
- Enjoy good company

This contribution

- Status of hardware and services
- Brief overview of project economy
- Results
- Look to the future

Norway's position at the Top500 list



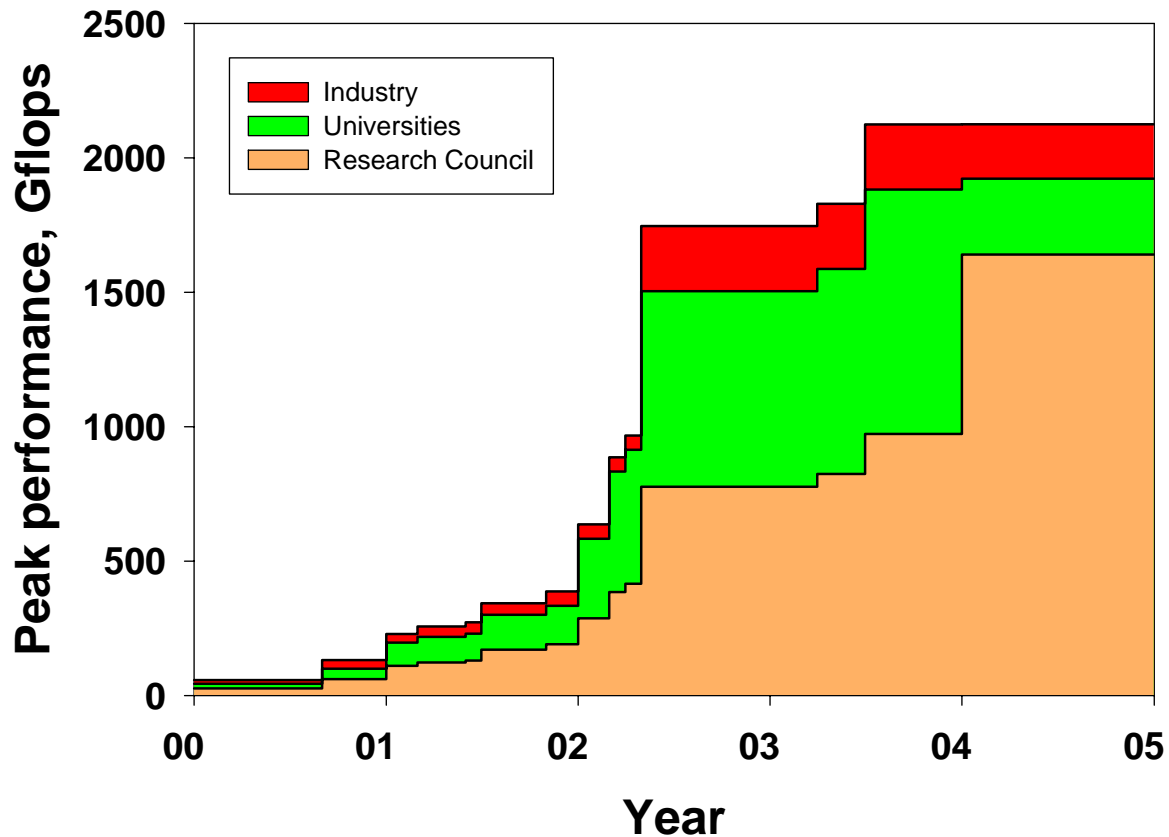
1986 - 1991: First HPC project

1991 - 1995: Second HPC project

1995 - 2000: Third HPC project

2000 - 2004: Fourth HPC project (Notur)

Shares in the Notur resources



Norway's HPC resources

NTNU: SGI Origin 3000
998 Gflops, 816 GB, 7.2 TB



UiB: IBM Regatta
499 Gflops, 320 GB, 7.5 TB



UiO: HP SuperDome
384 Gflops, 128 GB, 4.0 TB



UiT: HP SuperDome
71 Gflops, 32 GB, 1.3 TB



Norway's HPC resources

NTNU: SGI Origin 3000
998 Gflops, 816 GB, 7.2 TB

UiB: IBM Regatta
499 Gflops, 320 GB, 7.5 TB



The Metacenter:

- Co-ordinated operations
- Helpdesk
- Software



UiO: HP SuperDome
384 Gflops, 120 GB, 4.0 TB

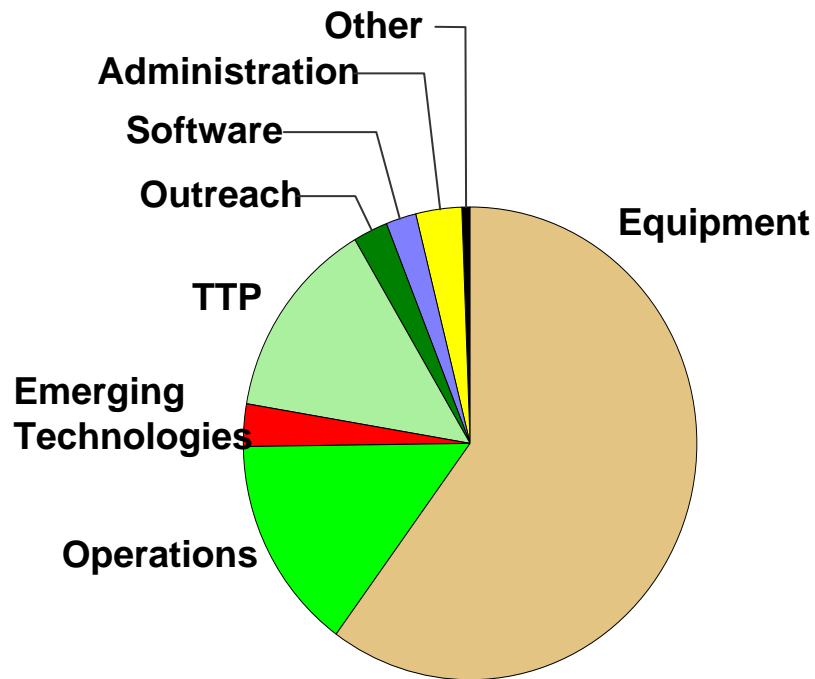
- Standardisation
- Advanced user support
- Operational efficiency

UiT: HP SuperDome
116 Gflops, 32 GB, 1.3 TB

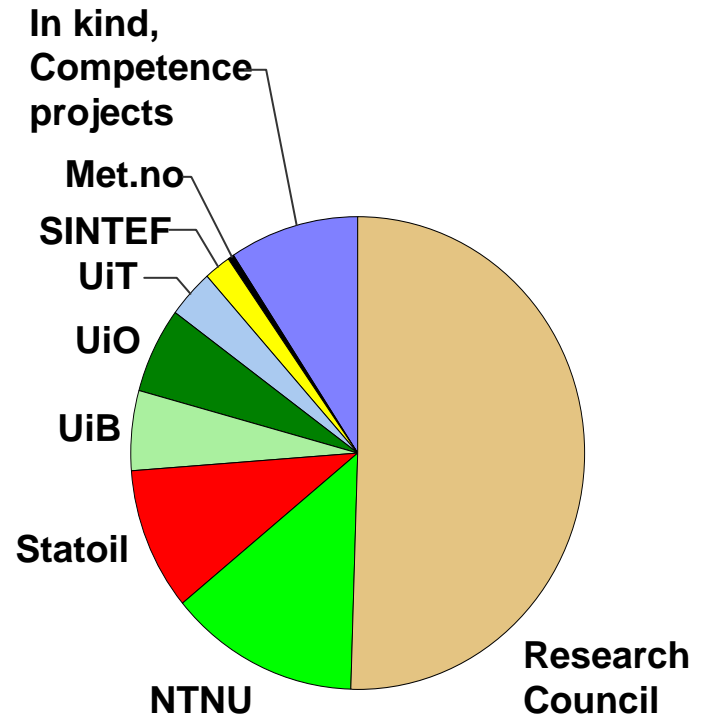


Budget 2000 - 2003 (168 MNOK)

Expenditures

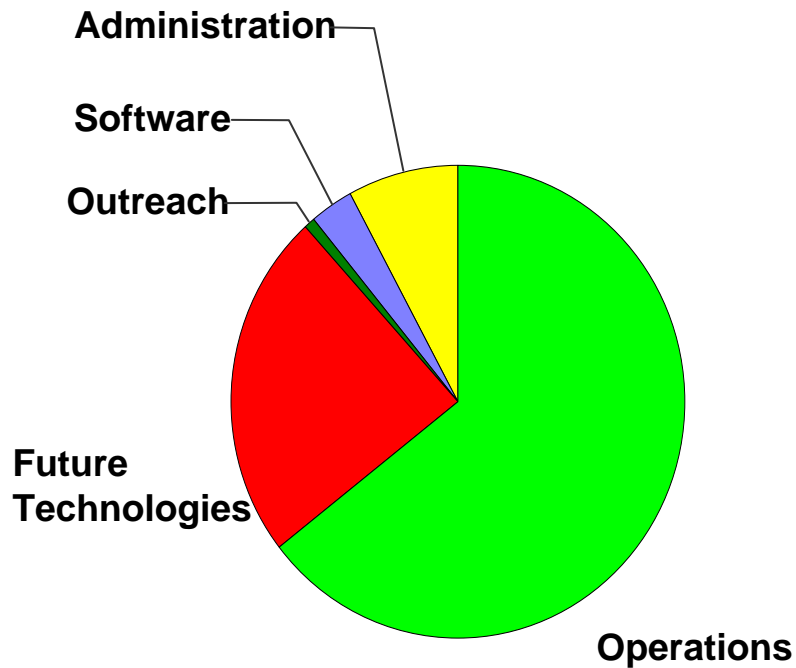


Sources

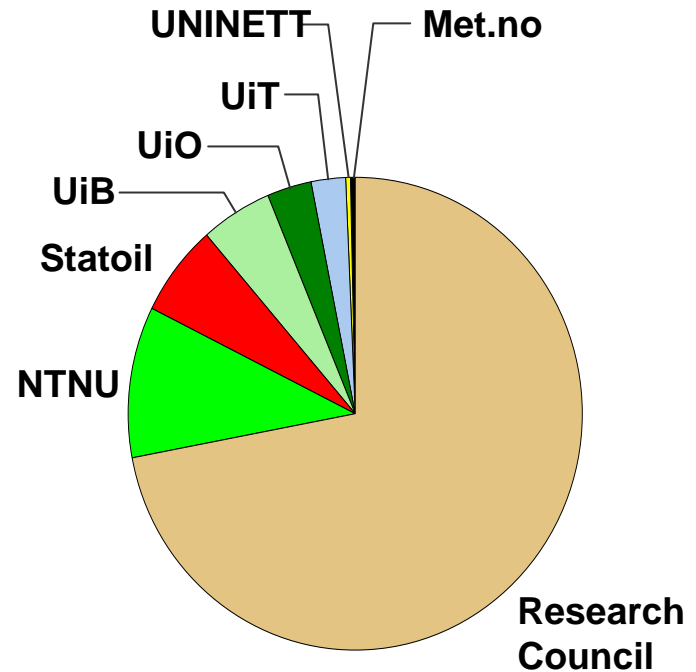


Budget 2004 (25.5 MNOK)

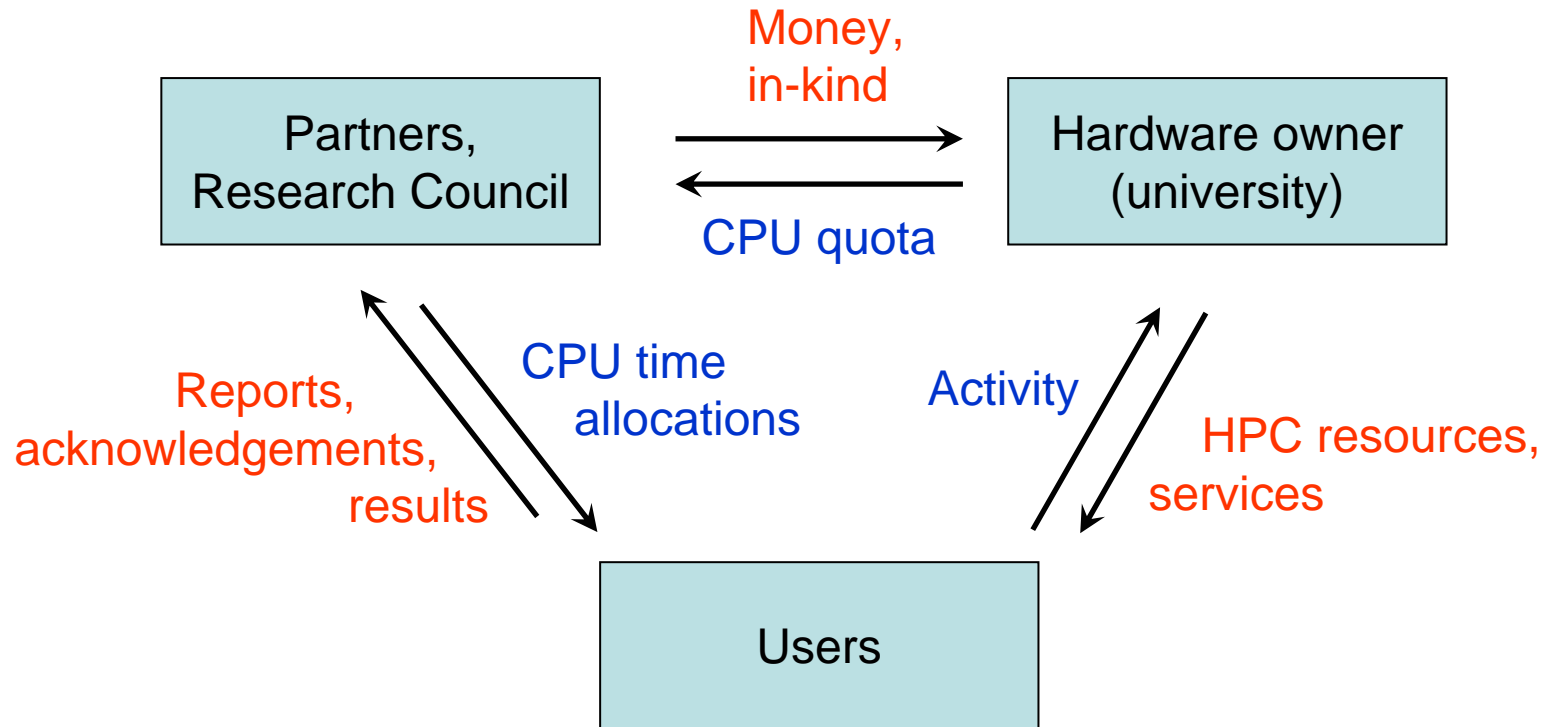
Expenditures



Sources

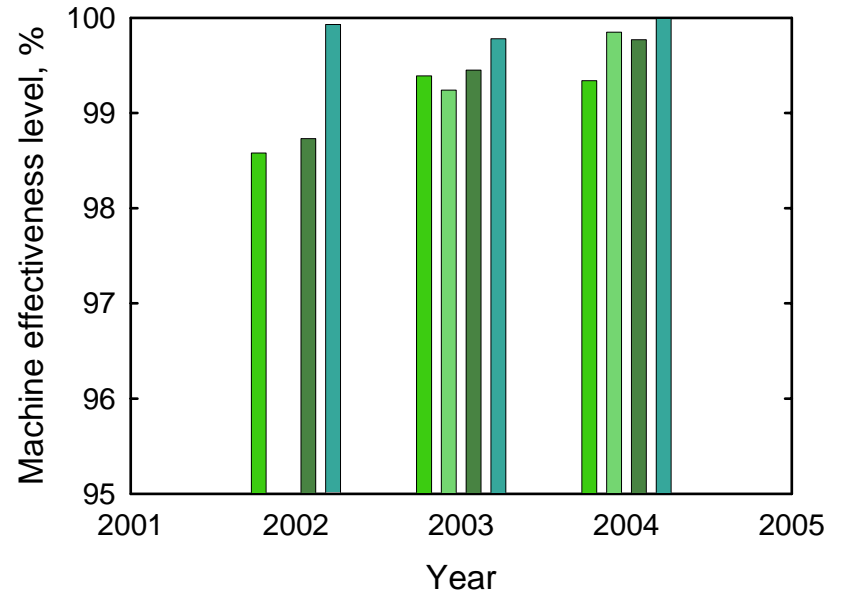
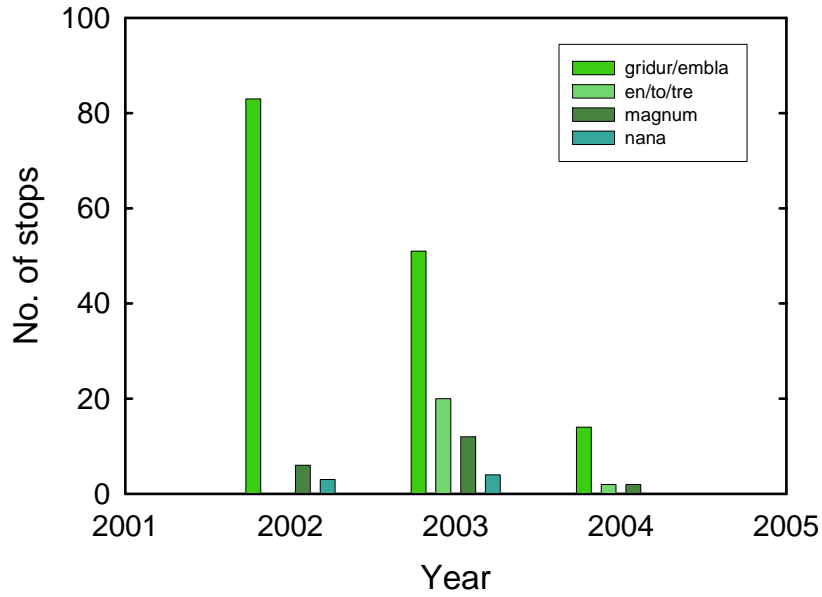


Economic model



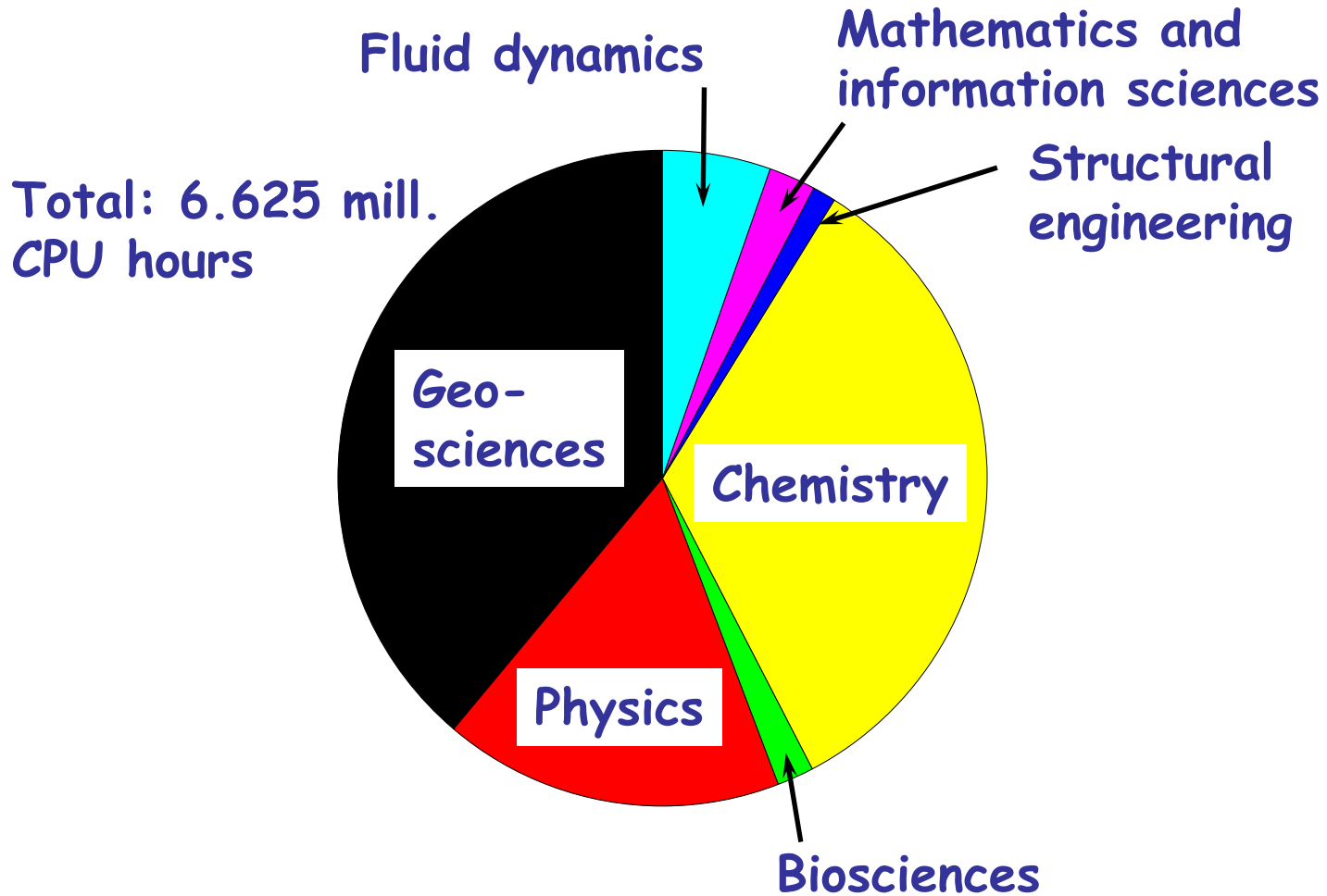
Resource flow
Activity flow

No. of stops and availability



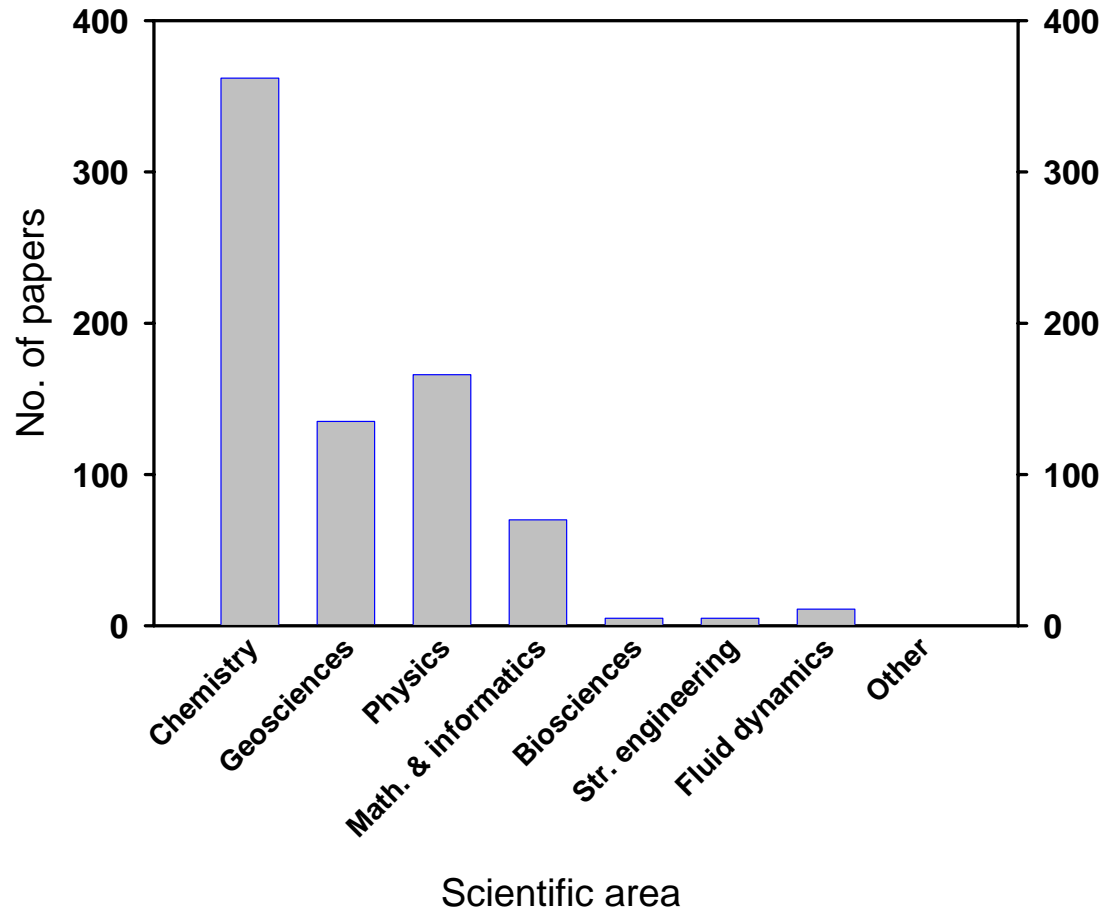
Here is the science

Usage of RCN's computer time (2001 - 2003)



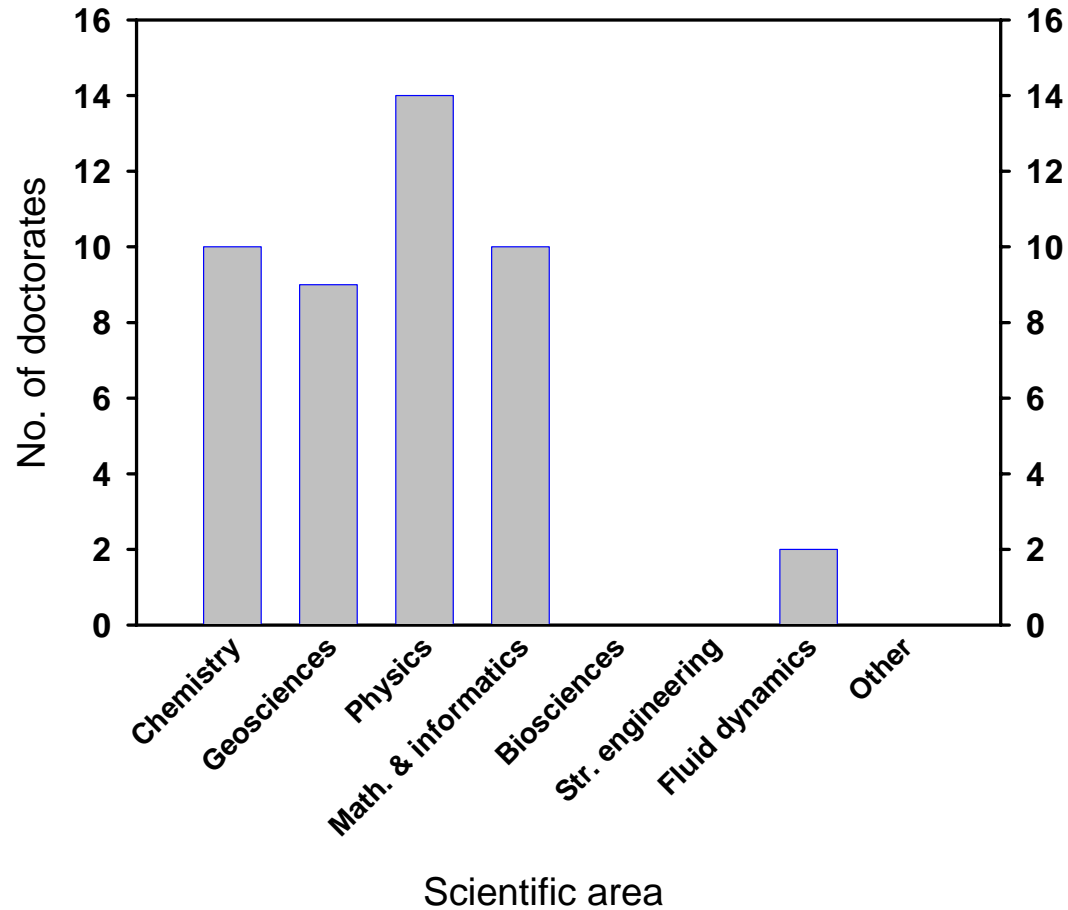
of papers vs. scientific area (2001-2003)

(754 in total)

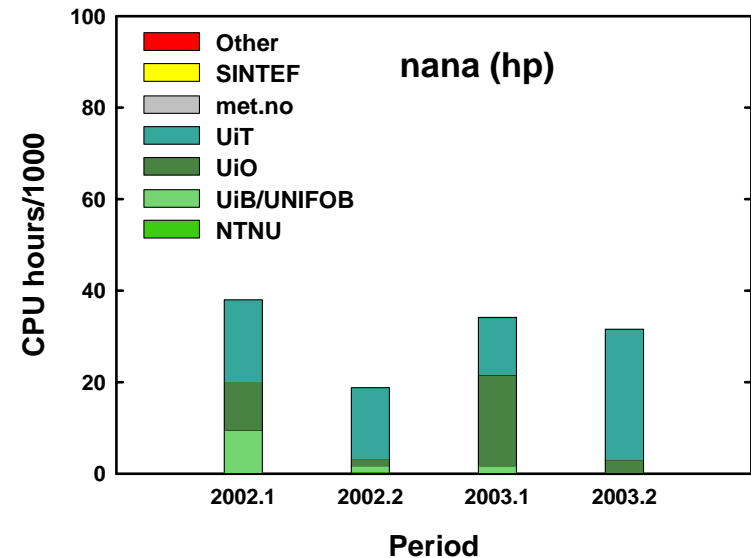
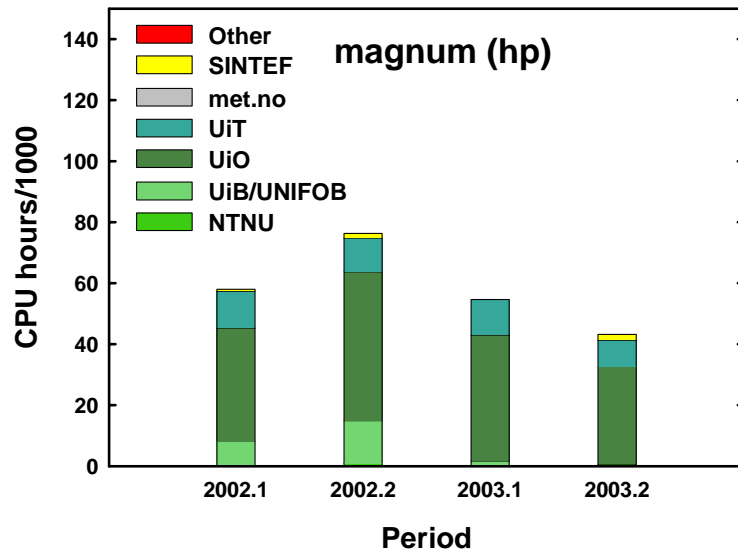
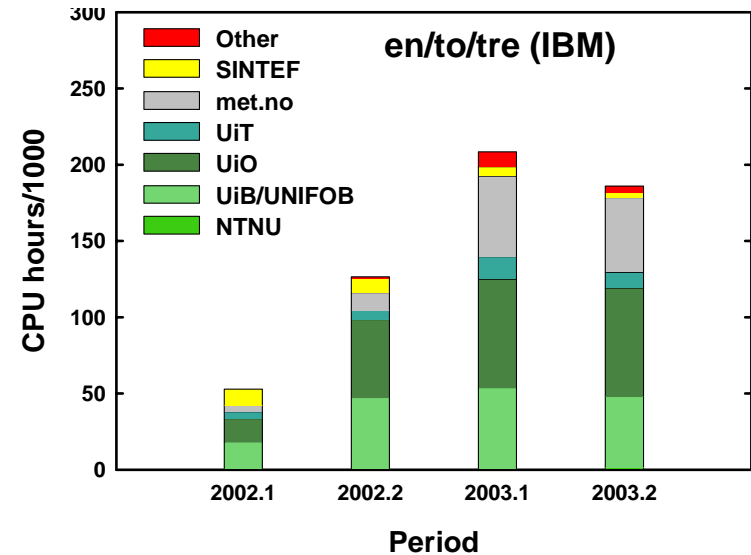
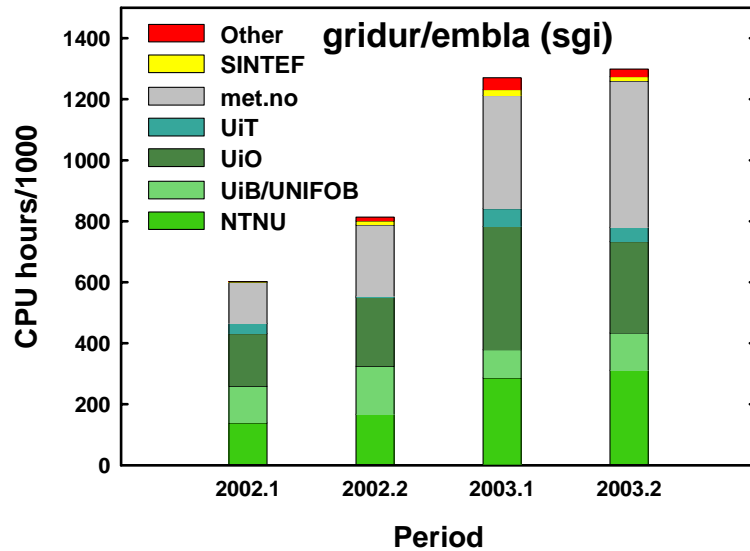


of doctorates vs. scientific area (2001-2003)

(45 in total)



Usage project home vs. machine home



You will hear more about these Notur activities:

Technology transfer projects: Staying competitive
in computational science

Preparing for the future: GRID technology

Resources in demand: Cluster computing and storage

Main conclusions

The Notur project has reaffirmed that a national co-operation is necessary and essential.

Advantages:

- share knowledge and competence between staff
- minimise duplication of work
- co-ordinate hardware and software purchases
- co-ordinate system operation, support, user resource allocation

The amount of compute power and storage capacity are limiting factors in traditional HPC areas like chemistry and physics.

Many scientific and engineering problems cannot be solved with compute power alone, but need to develop jointly with enabling sciences (mathematics, computer science).

Recommendations from "The Notur Experience"

Build on the Notur infrastructure
Organise operations in a Metacenter
Spread the machine purchases over time
Co-ordinate the project in a better way with major national research programs that have large demands for large-scale computing facilities
Give the project a longer life span
Provide permanent advanced user-support and technology transfer projects
Set stronger requirements to (large) users
Continue the Resource Allocation Committee as a user-representative body reporting to the RCN

Main Notur activities

The Metasenter: Making the HPC resources available to the users

Technology transfer projects: Bridging the gap between computer science and applications

GRID technology: Establishing a GRID of Norwegian HPC resources

Cluster technology: Testing and developing various cluster solutions

Outreach & dissemination: Making HPC available to *new* users

Recommendations wrt. hardware and operations

Build on the Notur infrastructure

Organise operations in a Metacenter

Spread the machine purchases over time

Recommendations wrt. organisation

Tie the project to its owners' organisations

Make clear goals and strategies for co-operation at an international, and particularly at a Nordic level

Co-ordinate the project in a better way with major national research programs that have large demands for large-scale computing facilities

Give the project a longer life span

Recommendations wrt. user services

Provide permanent advanced user-support and technology transfer projects

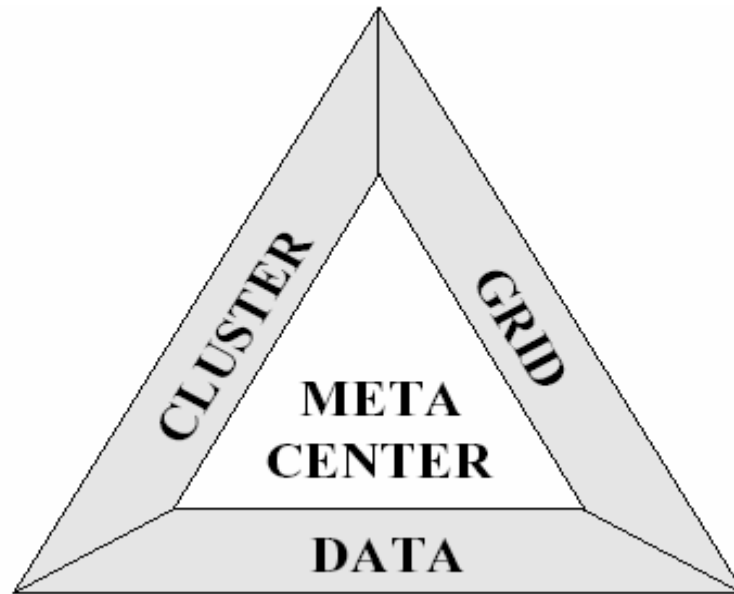
Set stronger requirements to (large) users

Establish a legal entity for the purpose of buying (multi-site) software licenses

Continue the Resource Allocation Committee as a user-representative body reporting to the RCN

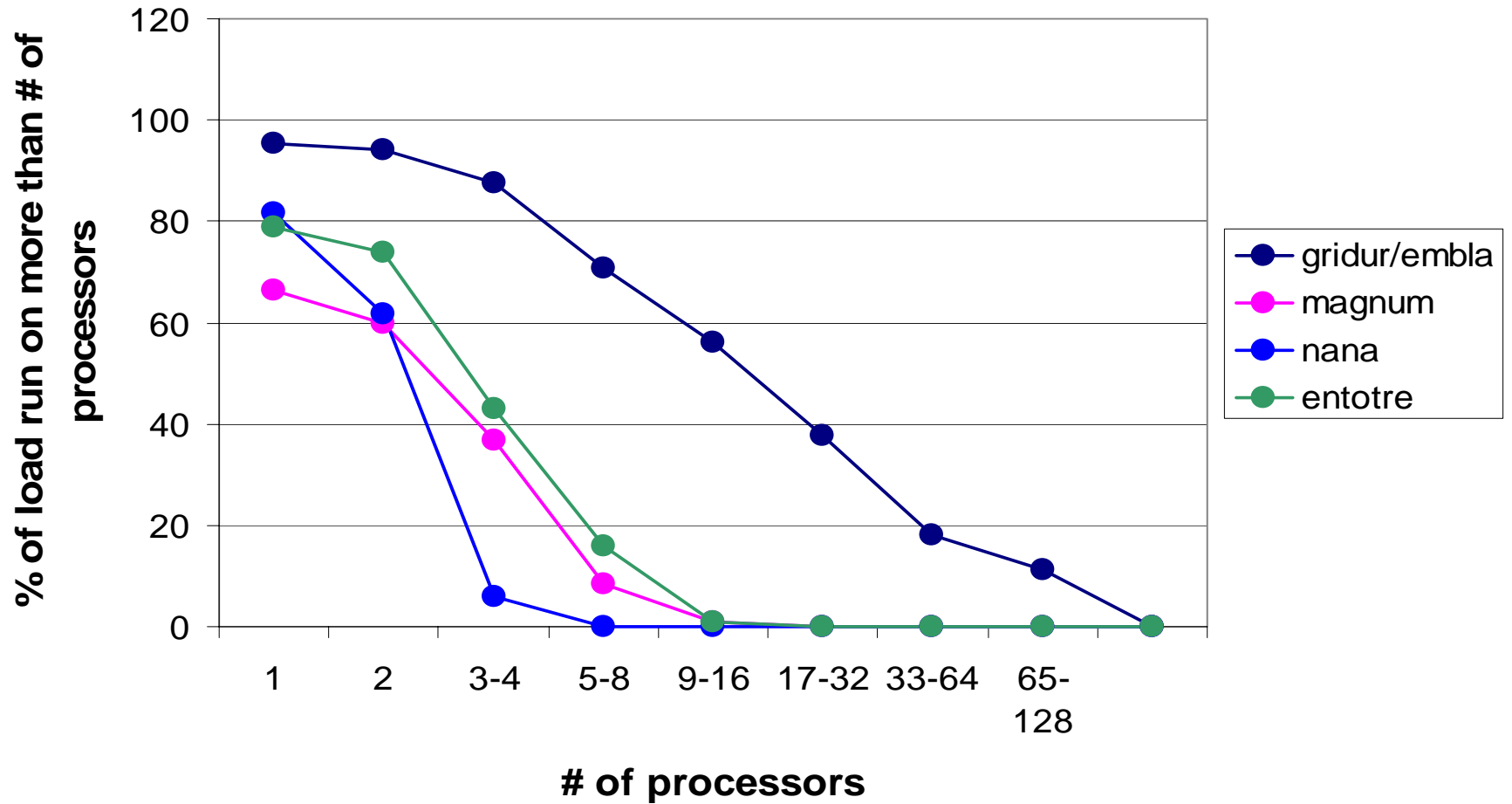
Future technologies

“Preparing for the future HPC infrastructure for computational science in Norway”



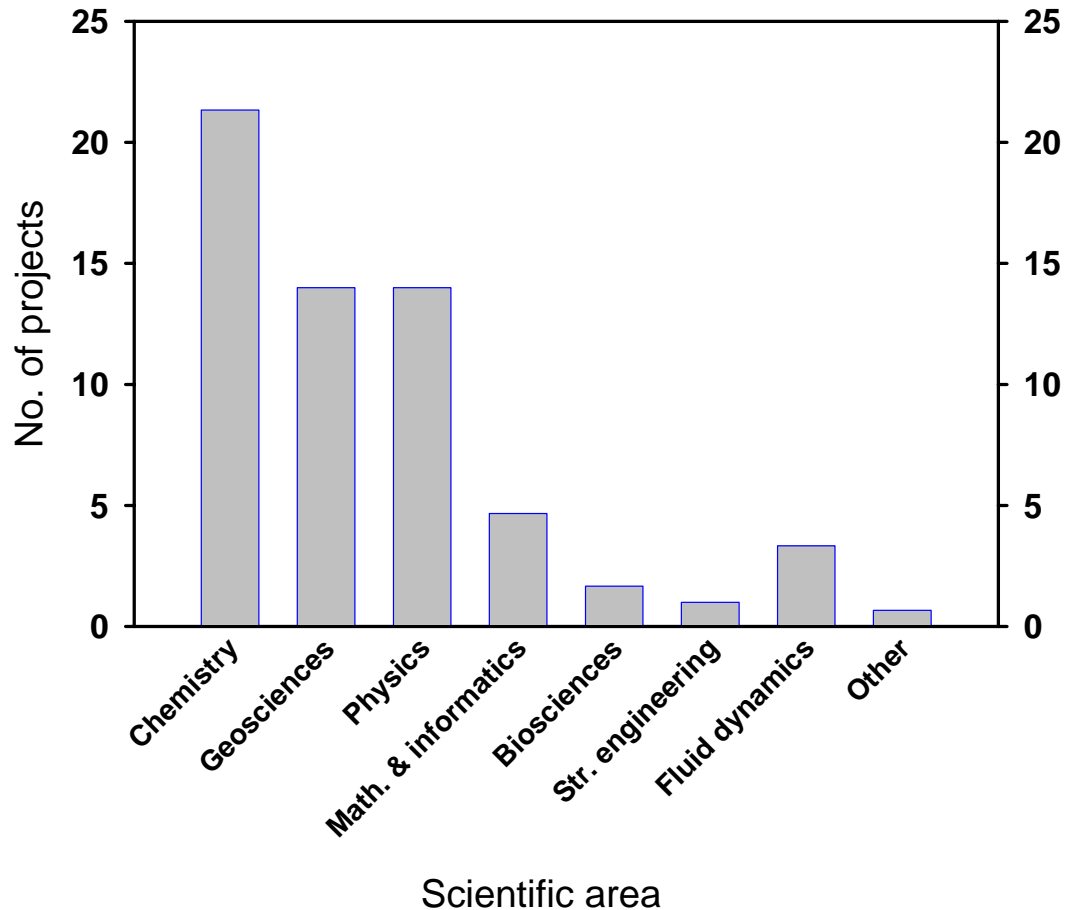
NorGrid

Parallel jobs 2002.2



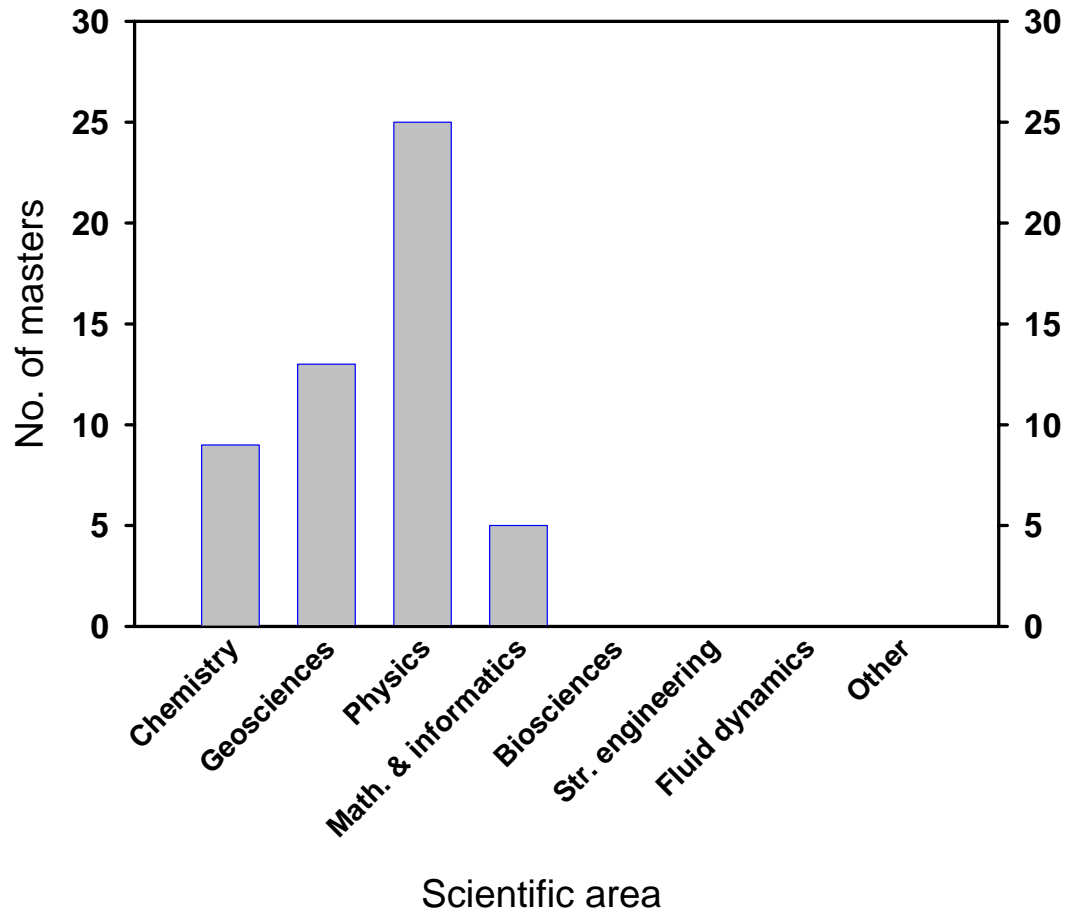
Average # of projects per year vs. scientific area (2001-2003)

(61 in total)



of masters vs. scientific area (2001-2003)

(52 in total)

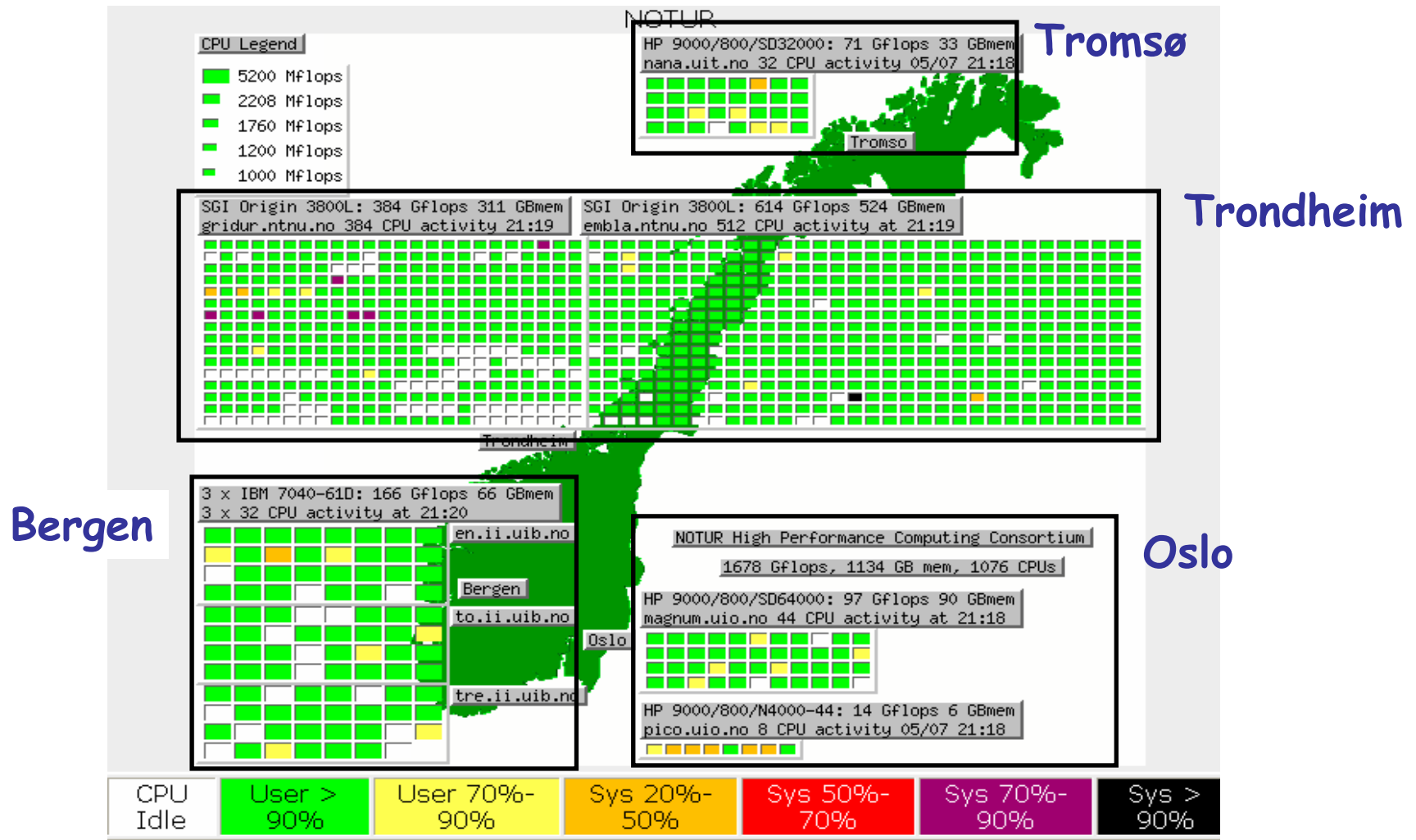


....in response to
The Principal Mission

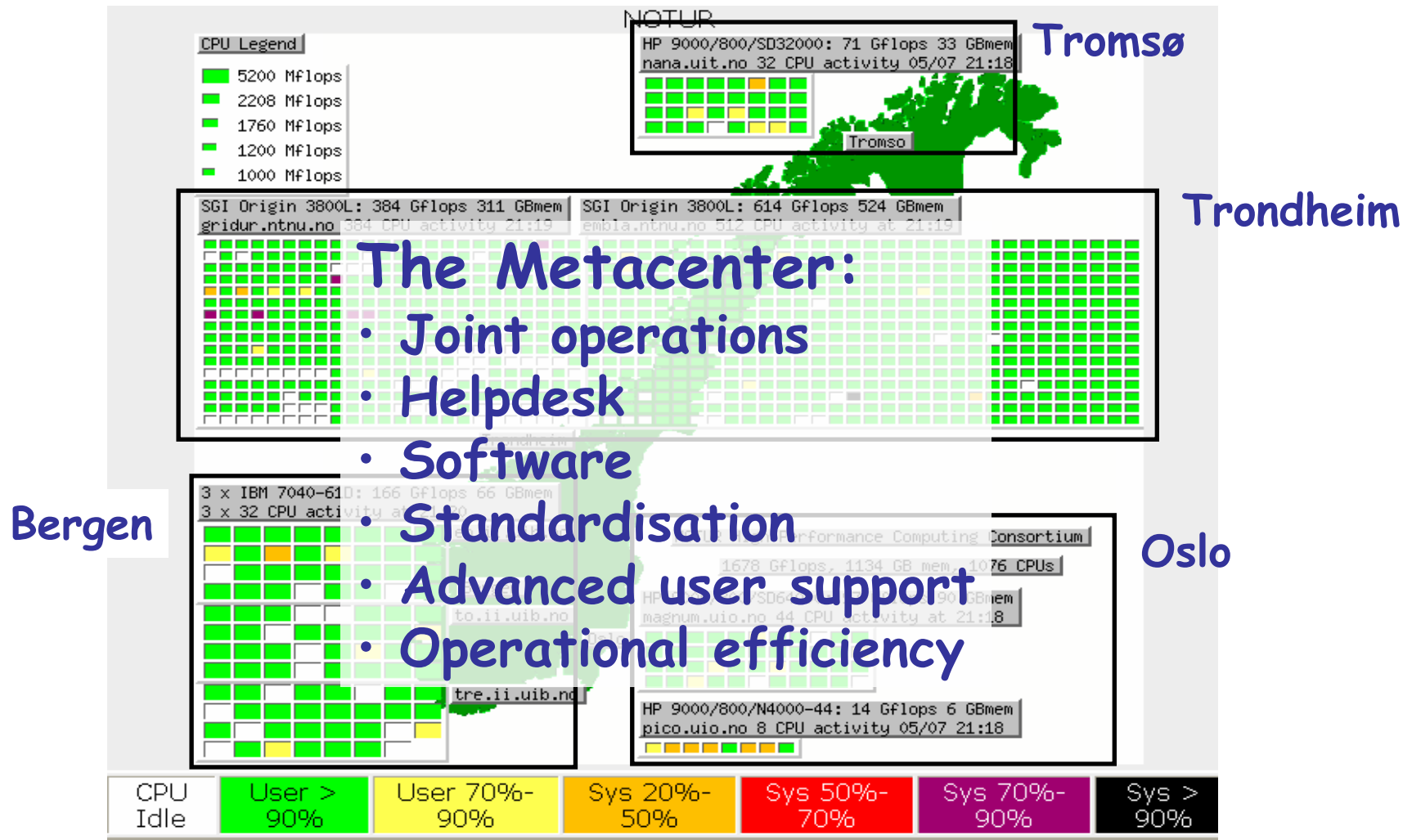
defined by the Research Council to be:

- to offer a cost effective national infrastructure for high performance computing for scientists at Norwegian universities and colleges;
- to provide the Norwegian Meteorological Institute with the required high performance computing facilities for operational forecasting and research;
- to ensure that other participants who contribute to the funding of the program can utilise the facilities.

Norway's HPC resources



Norway's HPC resources



Project Organisation

