Researcher Perspectives on e-Infrastructure Provisioning

e-IRG Workshop, 9 March 2016, Amsterdam
"*Progress of the e-infrastructure commons*"

The Danish e-Infrastructure Cooperation (DeiC) is the national provider of research e-Infrastructure to Danish research, endorsed by the Danish Ministry of Higher Education and Science, and co-financed by the ministry and the 8 Danish universities.

Disclaimer
All thoughts, opinions and conclusions presented here are collected through years of contact with researchers,
but are personal and not representing DeiC in any way.

DeiC

Content:

1. A presumed aim: An e-Infrastructure Commons
2. Content of such Commons - Three elements
   - Coordination – Who is in charge of strategy, staffing and spending?
   - Provisioning – Which e-infrastructures? By whom, for whom?
   - Innovation – Who knows how to get professionalism and quality?
3. Content relevance for the "head" and the "long tail"
4. Realizing the e-Infrastructure provider crises
5. Re-inventing the e-Infrastructure Providers

The e-Infrastructure Commons

A concept most researchers would support - as defined by the e-IRG White Paper 2012:

An integrated living _ecosystem of resources and services_ that is open, user friendly and accessible to European researchers and scientists, and continuously adapts to the changing requirements of research and science

Questions researchers might have:

• Is there a more or less coherent European policy, organisational- and funding structure for pursuing a e-Infrastructure Commons?

• Is there a suggested e-Infrastructure content of such a Commons?

• Can the hitherto national and European e-Infrastructure providers deliver?

The Commons, as defined by e-IRG, has three distinct elements:

1. A platform for **coordination** of the services building the Commons, with a central role for European research, innovation and research infrastructure communities

2. **Provisioning** of sustainable and interoperable e-infrastructure services within the Commons, promoting a flexible and open approach where user communities are empowered to select the services that fulfil their requirements

3. Implementation of **innovation** projects providing the constant evolution of e-infrastructures needed to meet the rapidly evolving needs of user communities

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Hassle-free user-friendly access to quality e-Infrastructure and competence

The Commons has three distinct elements:

Q: Can the hitherto European policy, organisational- and funding structure embodied in *e-Infrastructure providers* deliver:

of the services building the Commons,
ean research innovation and research

• **Provisioning** of sustainable and interoperable e-infrastructure services within the Commons, promoting a flexible and open approach where user communities are empowered to select the services that fulfil their requirements

Hassle-free user-friendly access to quality e-Infrastructure and competence

• Implementation of **innovation** projects evolution of e-infrastructures needed needs of user communities

A: No…, probably not. Hence, focus on the third distinct element of the Commons: "**innovation**", of the e-Infrastructure provider concept itself.

Complexity of the three elements

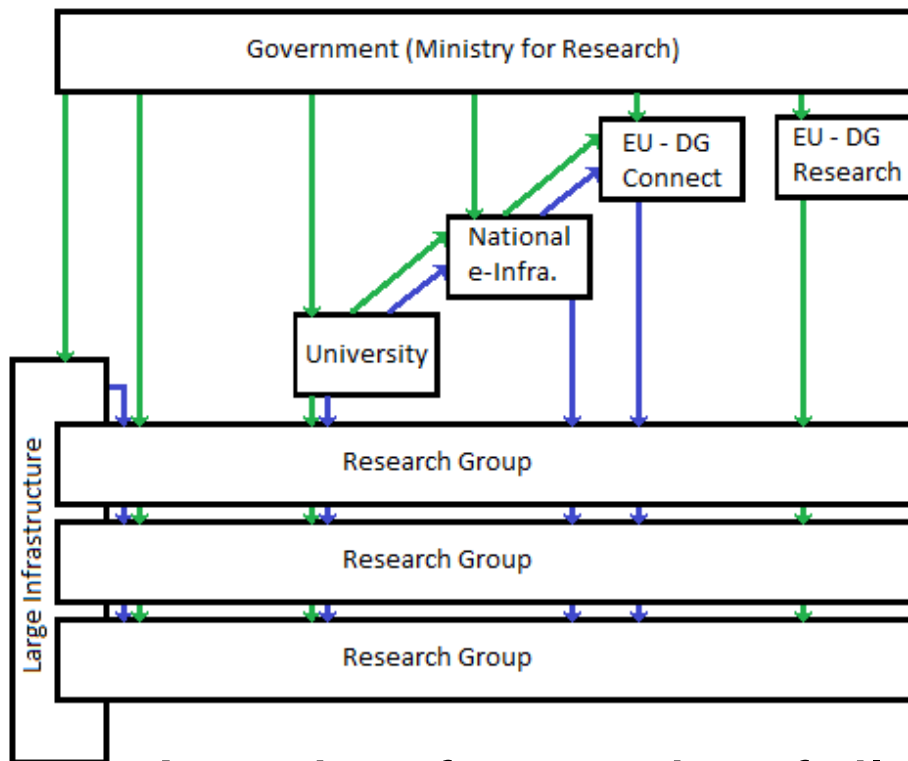1. Coordination – Who is in charge of strategy, staffing and spending?
   - Researchers >< e-Infrastructure specialists
   - The elite (Head) >< the masses (Long tail)
   - National ministries >< European Commission
   - DG Research >< DG Connect

2. Provisioning of e-Infrastructures – Which ones? By whom, for whom?
   - Developed by e-infrastructure provider >< purchased by e-infrastructure providers
   - Developed by e-infrastructure provider >< Developed by researchers
   - Provisioning at local level >< Provisioning at national level >< Provisioning at European level

3. Innovation – Who knows how?
   - e-Infrastructure provider innovation
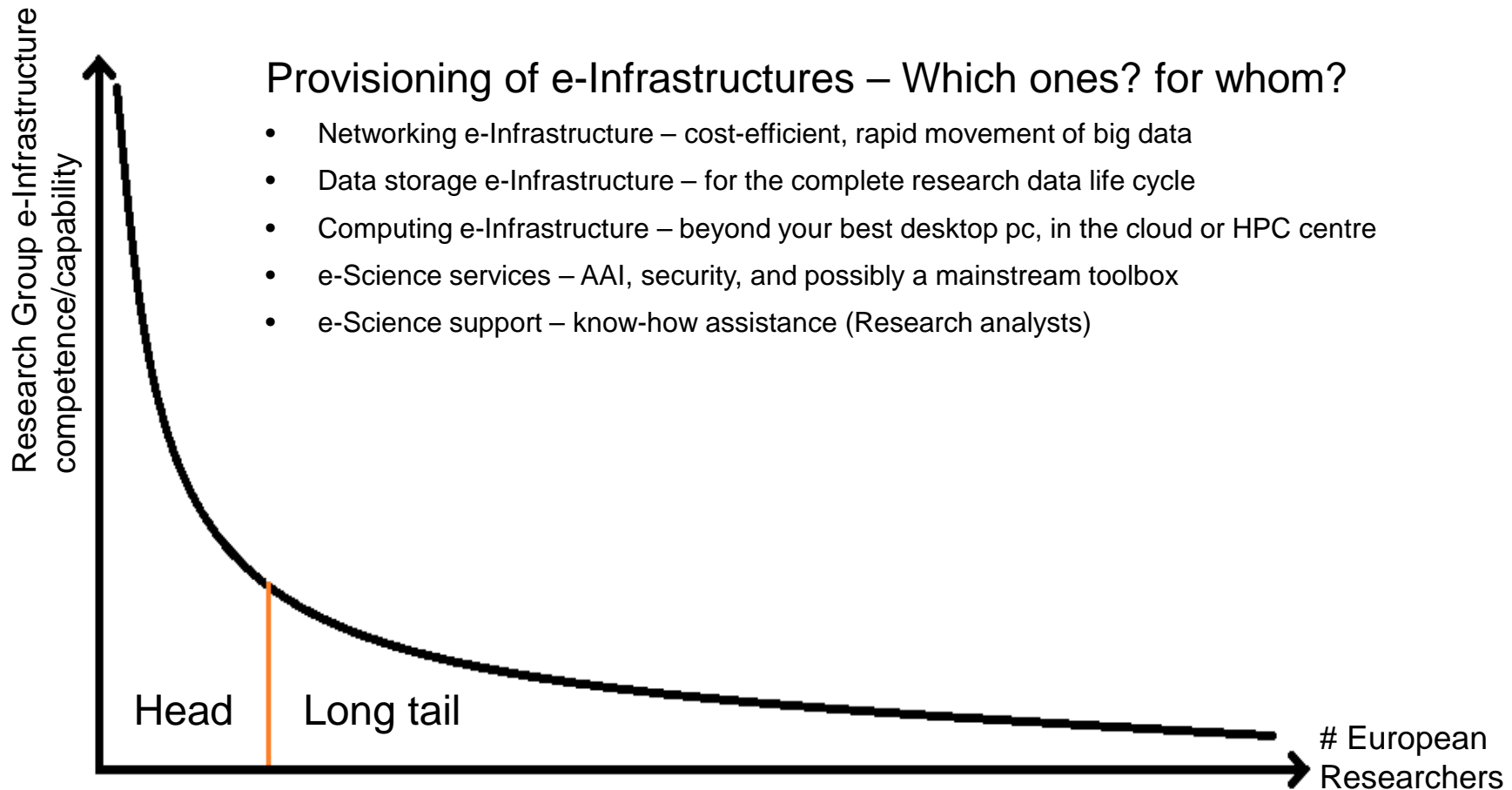   - Researchers e-Infrastructure innovation
   - Global commodity market (GAFA)

Coordination - Who is in charge of strategy, staffing and spending?

A recipe for market failure

Provisioning of e-Infrastructures – Which ones? for whom?

- Networking e-Infrastructure – cost-efficient, rapid movement of big data

- Data storage e-Infrastructure – for the complete research data life cycle

- Computing e-Infrastructure – beyond your best desktop pc, in the cloud or HPC centre

- e-Science services – AAI, security, and possibly a mainstream toolbox

- e-Science support – know-how assistance (Research analysts)

Research Group e-Infrastructure competence/capability
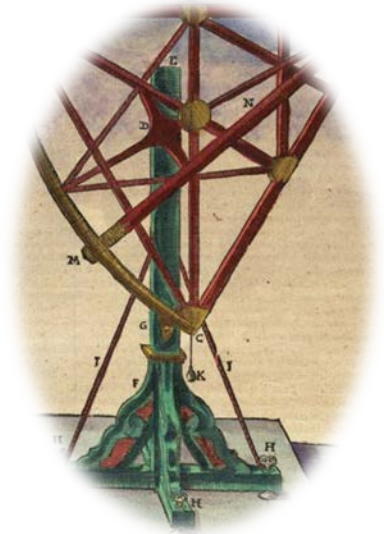
Head | Long tail

European Researchers

Instrument – Specialisation

(ESFRI-like, for the "head")

Specialised high-end networks, storage, compute instrumentation and support, which is at the cutting edge of technology and human capacity

vs.

e-Infrastructure – Consumption

(GAFA-like, for the "the long tail")

General purpose reasonable quality networks, storage, compute infrastructure and services, which are cost effective
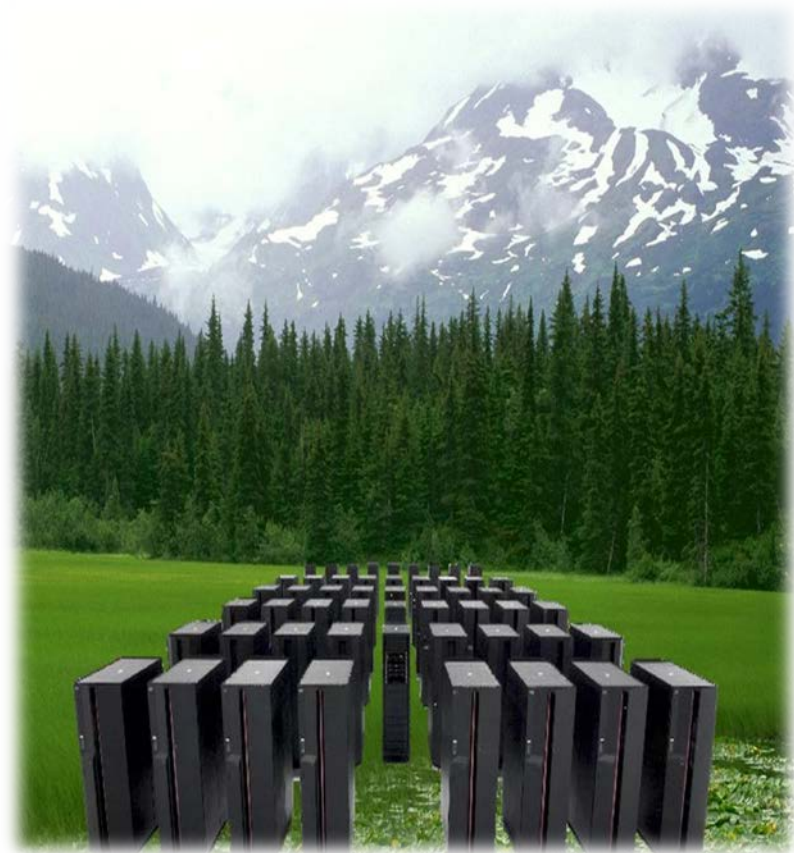
Some researchers (the head) need:

- to absorb, move or replicate >exabytes of data

- to host huge dynamic databases

- occasional or constant Tier-0/1 HPC access

- to build specialised HPC

- instrument-proximity for endless tweaking

- to have complete control (root password, complete middleware and software dictatorship, i.e. system administration ownership)
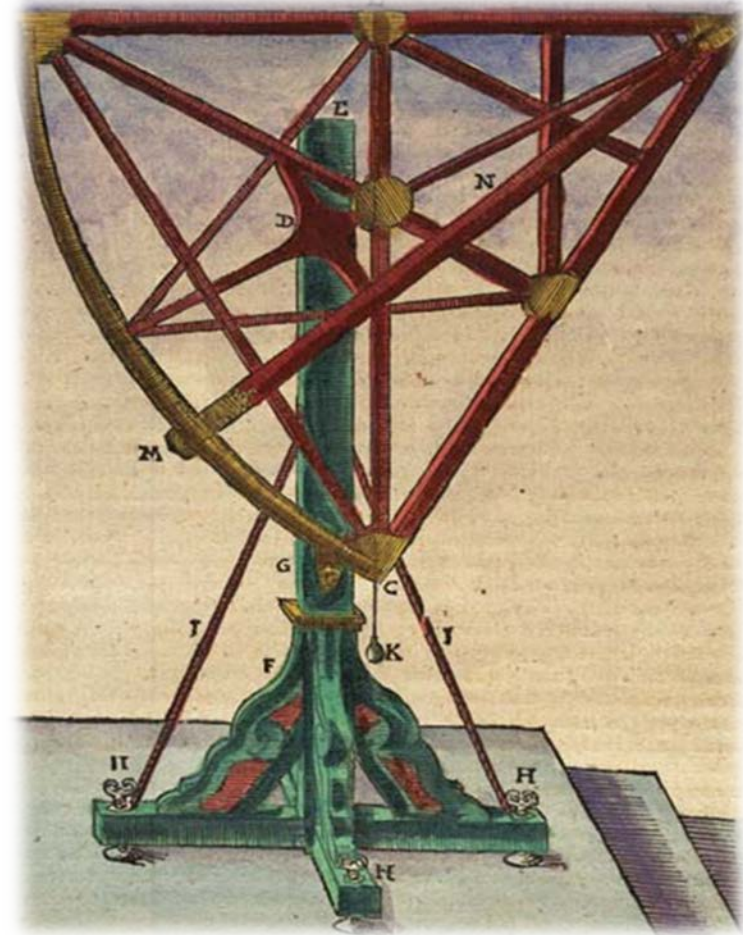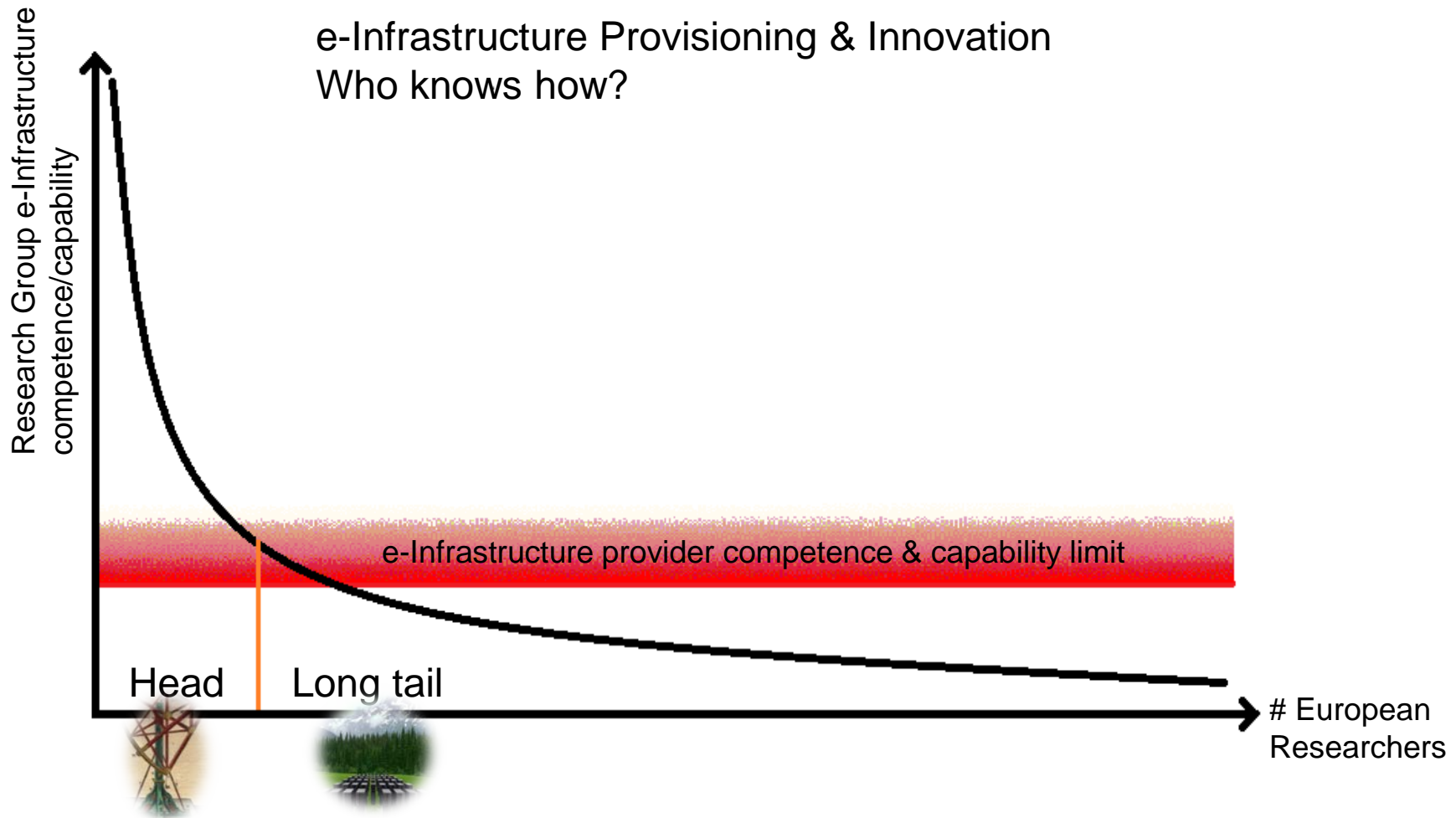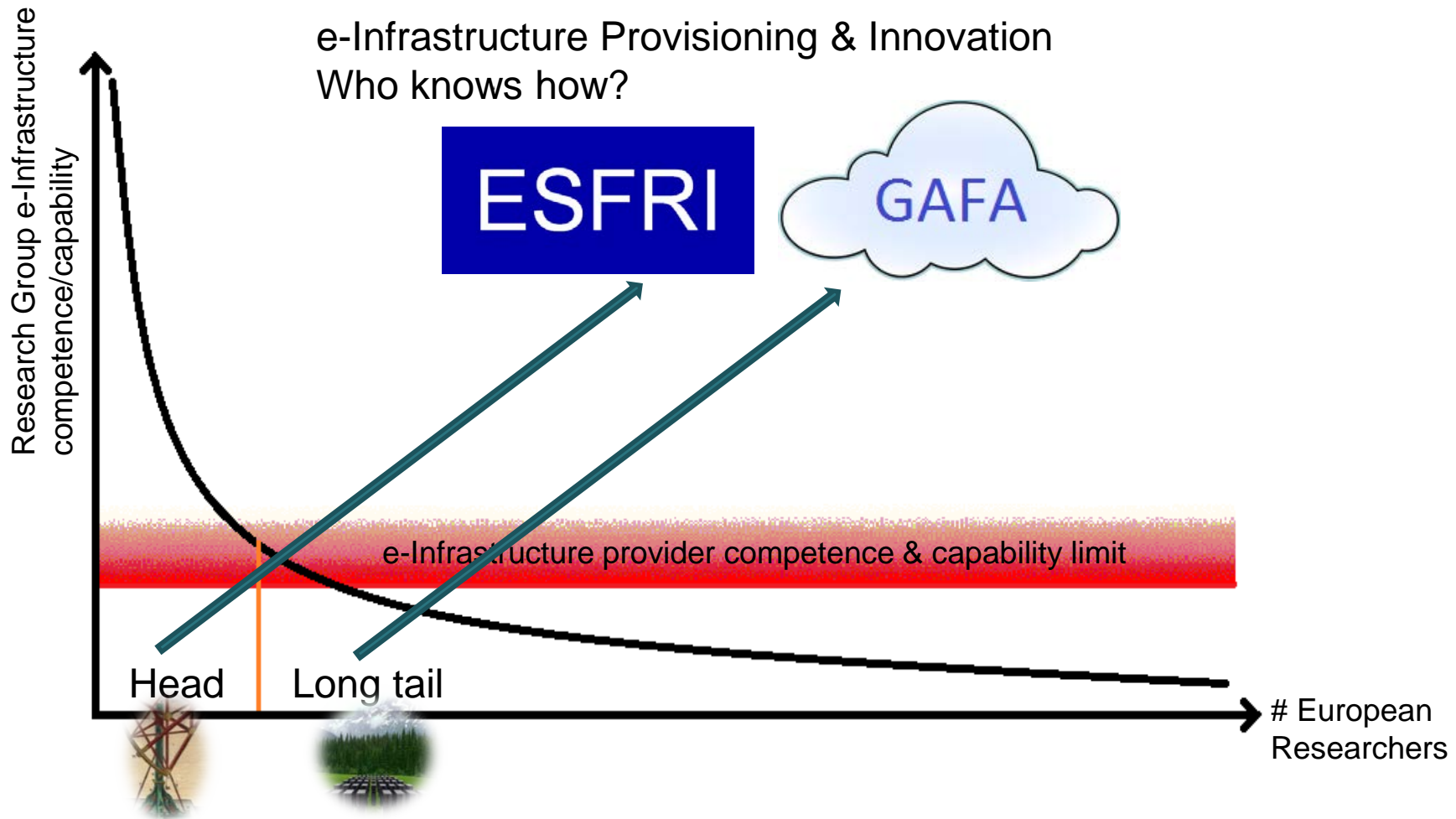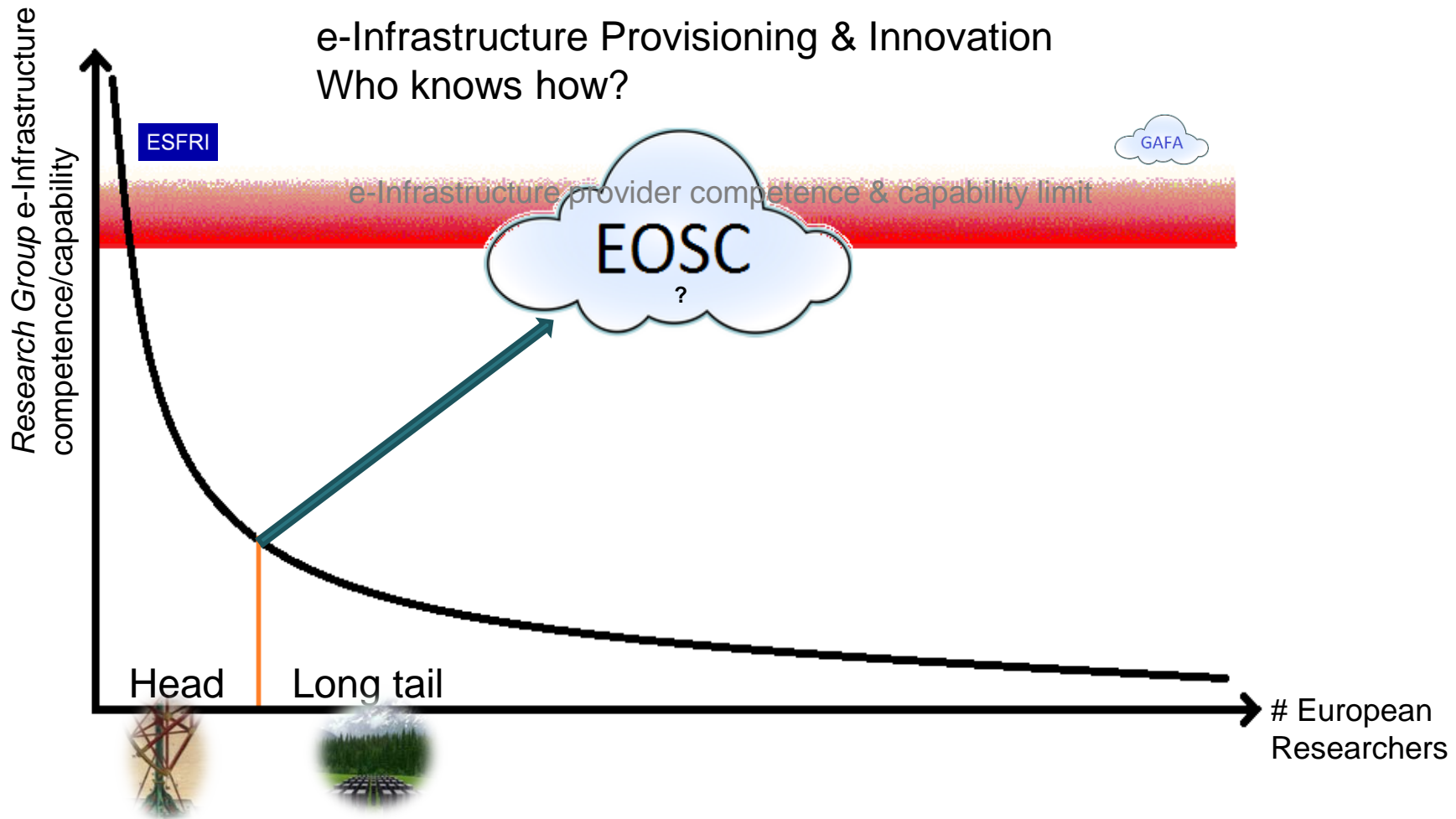
Other researchers (the long tail) need:

- Internet – somewhat better than, say, at a local Hilton Hotel

- shielding – against ransomware, botnets etc.

- to store, share or synchronise small dynamic datasets (< petabyte)

- to archive static datasets, so others might easily find and use them

- to just compute..., anywhere, with whatever (e.g. cloud), as long as it is scalable, works, and is affordable

- to have a nice (GAFA-like) user interface. I.e. no voodoo, command line scripts or steep learning curves

- to have no hassle with local system administrators or computer centre bosses. I.e. no e-Infrastructure access via bureaucracy and ass-kissing

e-Infrastructure Provisioning & Innovation
Who knows how?

Research Group e-Infrastructure competence/capability

e-Infrastructure provider competence & capability limit

Head

Long tail

European Researchers

e-Infrastructure Provisioning & Innovation
Who knows how?

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e-Infrastructure Provisioning & Innovation
Who knows how?

ESFRI

GAFA

e-Infrastructure provider competence & capability limit

EOSC
?

Research Group e-Infrastructure competence/capability

Head   Long tail

European Researchers

European Open Science Cloud for Research ?

"Cloud e-Infrastructure" *might* be understood to be about more than sheer access to physical ICT hardware. It is about a *Commons* of coordination, provisioning and innovation of ICT hardware, software, standards and expertise, all related to data-driven science and innovation

I.e. everything that is within the scope of the current research e-Infrastructure provider concept

Is EOSC a new point of departure, in addressing the current state-of-affairs?

Resume: Concluded Fact

National and European e-Infrastructure providers are – for understandable reasons – losing their customer base:

- The researcher elite (the "head") increasingly prefer the ESFRI-style research infrastructure set-up, which doesn't need or doesn't find e-Infrastructure providers to be "useful" and would, therefore, rather go it alone.

- The researcher masses (the "long tail") increasingly prefer the Google, Apple, Facebook, and Amazon (GAFA) type commercial vendors, which are seen to be much better at delivering what is needed

Resume: Consequence

National and European e-Infrastructure providers, becoming only marginally useful with only few grateful customers, are losing their raison d'être, and risk becoming counterproductive to the H2020 rationale

**Is EOSC a new point of departure,
in addressing the current state-of-affairs?**

Conclusion

Yes, EOSC, but only if needed action is taken, i.e.:

A re-invention of the e-Infrastructure provider concept, with a much more clear focus on

- ✓ **Academic professionalism** (different staff)

- ✓ **Commoditization** (different role)

- ✓ **Market mechanisms** (different funding structure)

Academic Professionalism (different staff)

- Substitute e-Infrastructure providers with Academic Institutes, with elite academic staff (of type "e-Scientists" or "Research Analysts"), which are seen as indispensable and highly recognised by fellow academics – i.e. competent, respected and valued colleagues

- e-Infrastructure Institutes must aim to publish and co-publish, and be involved in all aspects of the research, in pursuit of science and academic careers. I.e. also payed like their colleagues, so as not to lose them
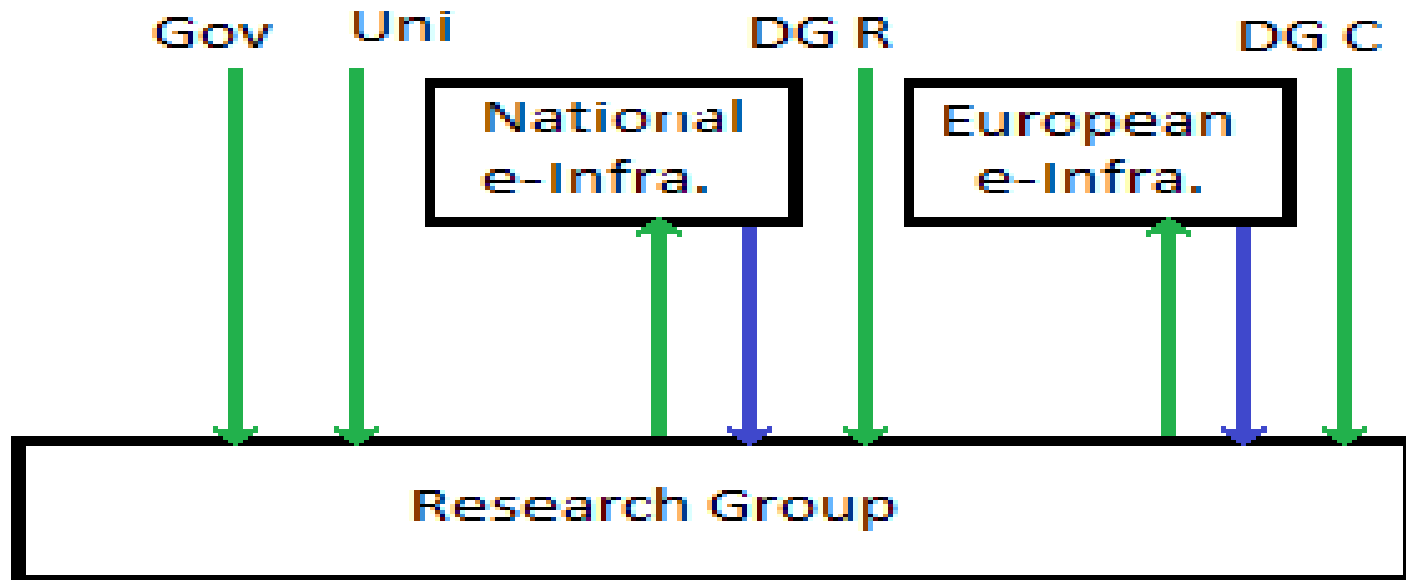
Commoditization (different role)

- e-Infrastructure Institutes that supplement and cooperate, not compete with the GAFA's

- See most e-Infrastructures (e.g. connectivity) as trivial market commodities, and focus on "high-end" innovation and specialised add-ons (e.g. Eduroam, AAI, security etc.)

- form "purchasing communities" for data services (store, share or synchronise small dynamic datasets) and for compute resources (like Amazon Elastic Compute Cloud (EC2) Cloud Server & Hosting)

- eradicate the local system administrators or computer centre bosses wherever possible, and where not possible, make them crown jewels and subordinate them researcher control (i.e. life dependency on researcher satisfaction)
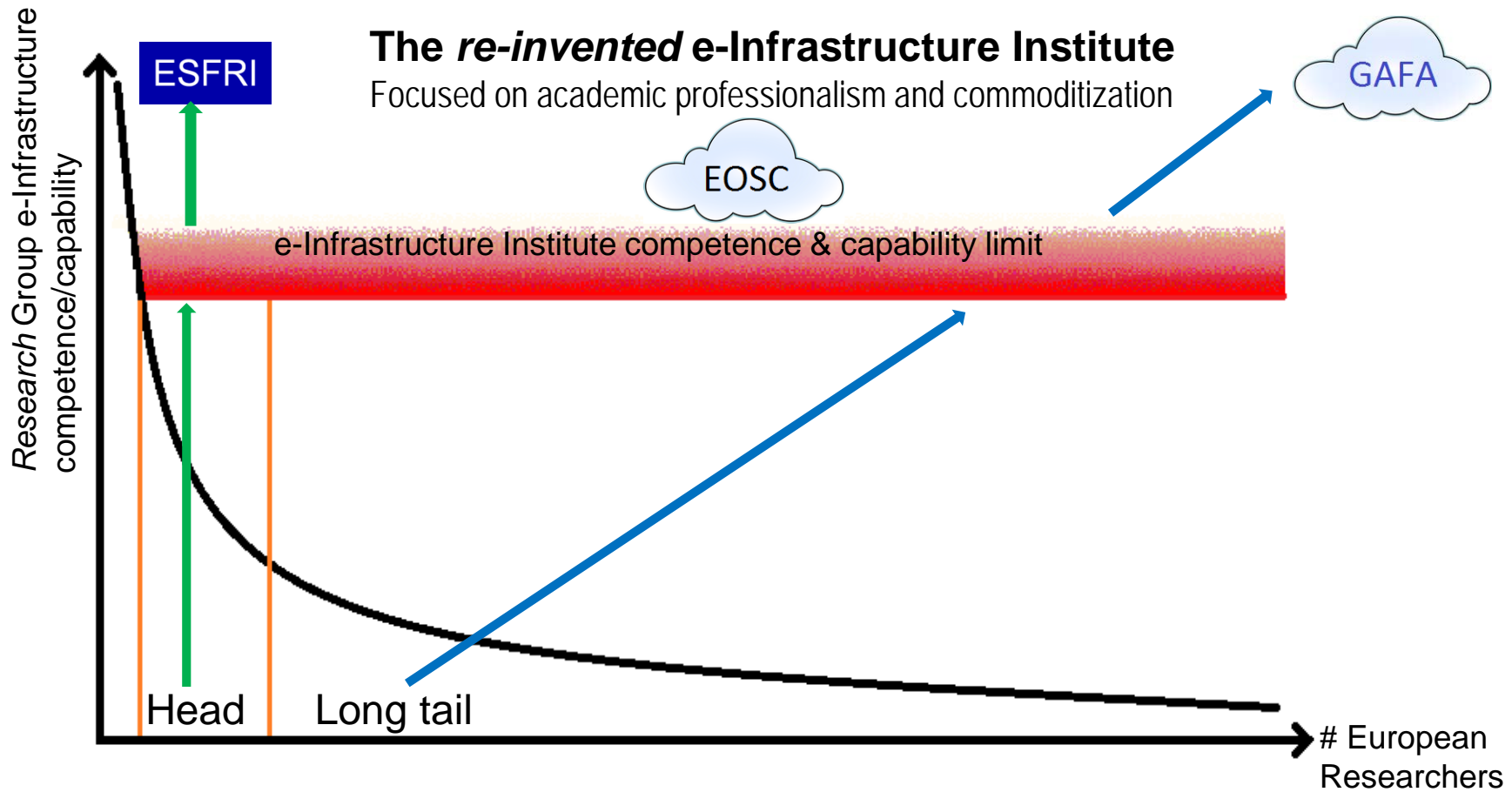
Market mechanisms (different funding structure)

Put researchers in charge of strategy, staffing and spending

→ Cash

→ e-Infrastructure

Gov   Uni   DG R   DG C

National e-Infra.   European e-Infra.

Research Group

Fix the *market failure*, bring back Darwinism

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Thank you !

Questions ?

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