

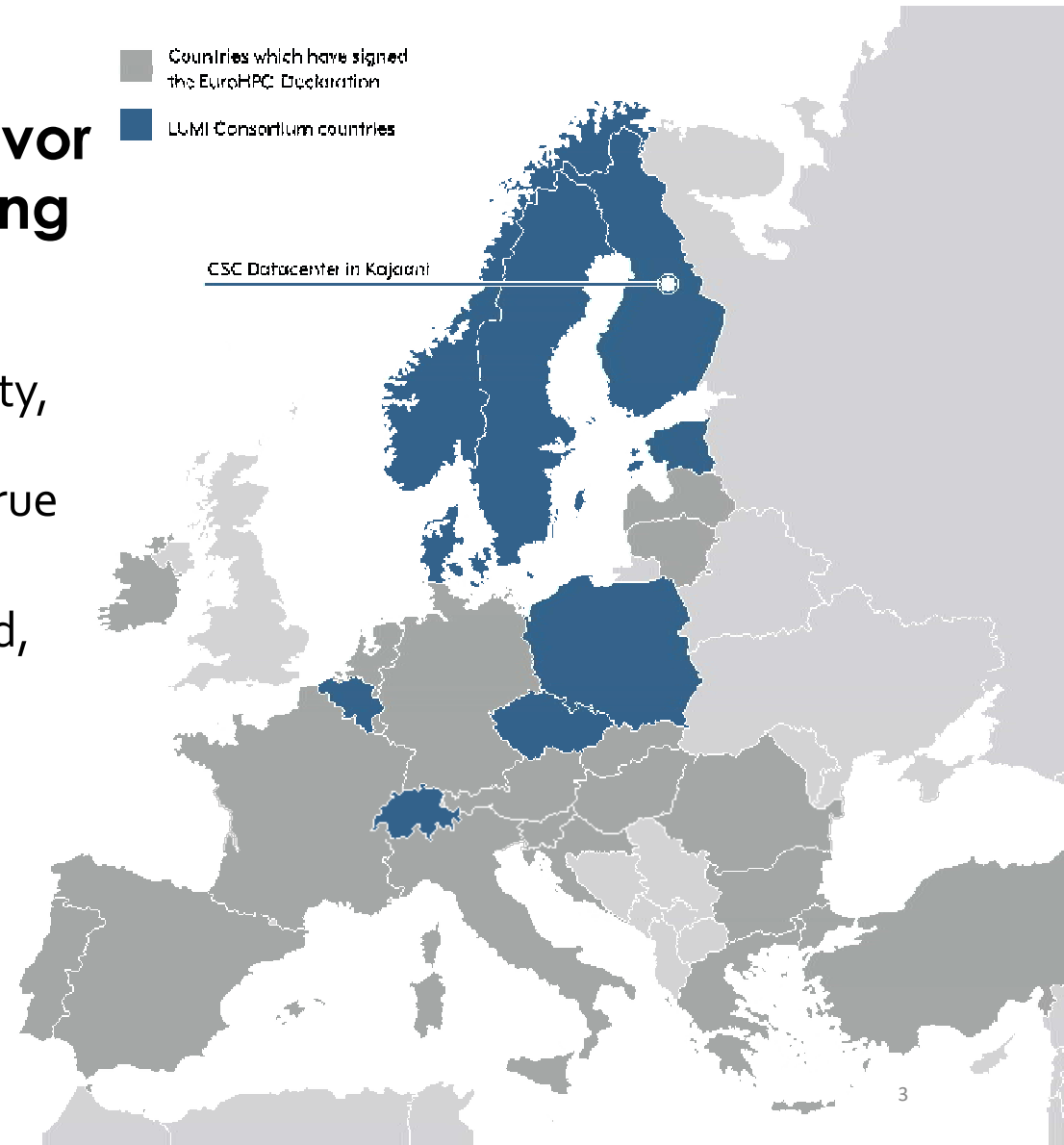
LUMI

A white wolf stands in the center of a snowy, futuristic landscape. The background is dark with numerous vertical light beams and floating particles, creating a high-tech, digital atmosphere. The wolf is looking directly at the viewer.

e-IRG 4.12.2019
Kimmo Koski, CSC

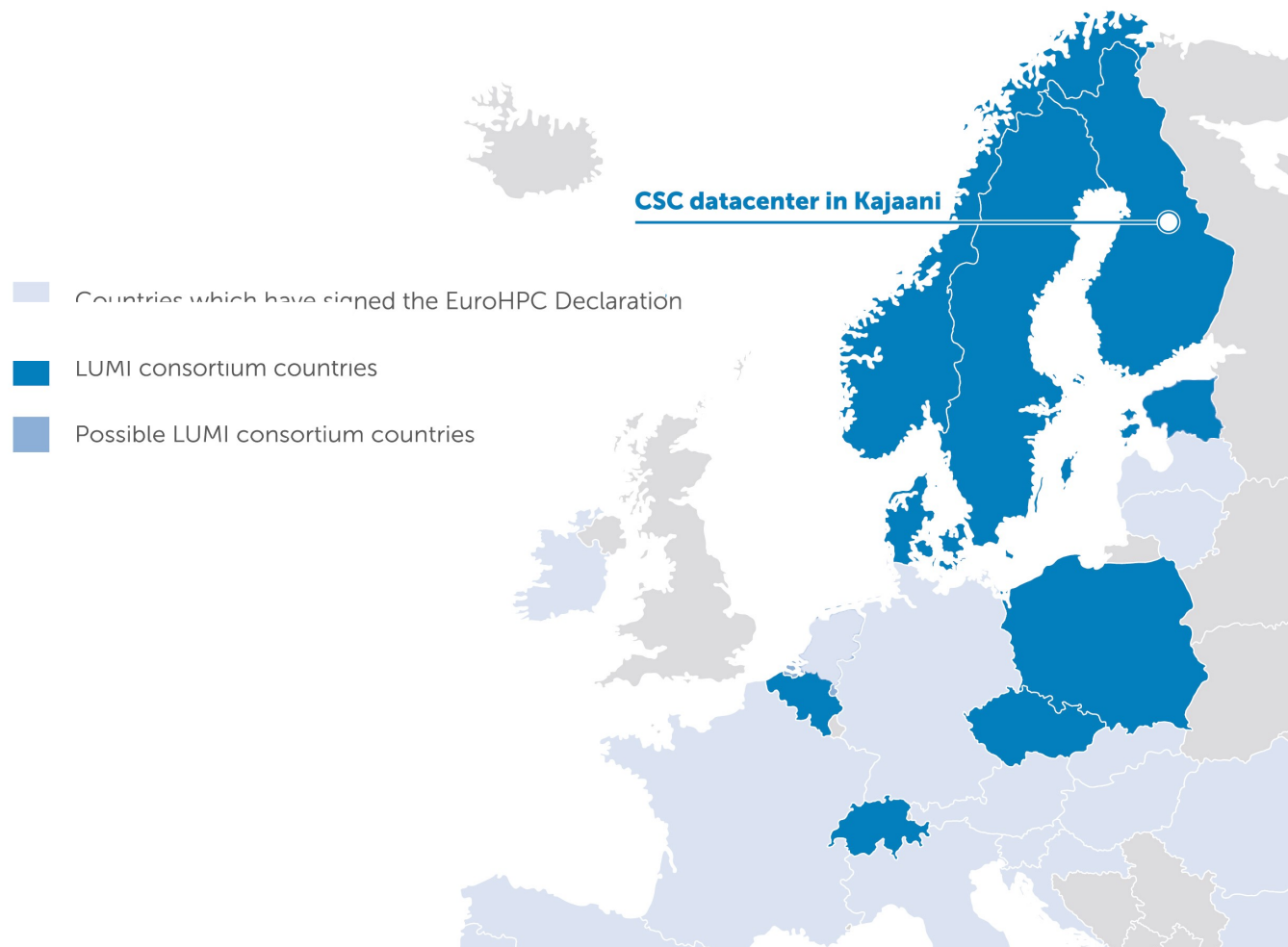
LUMI – a unique joint endeavor in high-performance computing

- **LUMI ecosystem** provides a high-quality, cost-efficient and environmentally sustainable HPC ecosystem based on true European collaboration.
- **LUMI consortium** members are Finland, Belgium, Czech Republic, Denmark, Estonia, Norway, Poland, Sweden and Switzerland.
- Consortium continues a solid tradition of collaboration in HPC training and education, user support and data management services.



LUMI budget

Finland	50 M€
Belgium	15.5 M€
Switzerland	10 M€
Sweden	7 M€
Denmark	6 M€
Czech Republic	5 M€
Poland	5 M€
Norway	4 M€
Estonia	2 M€
EU	102,5 M€



LUMI Datacenter

2200 m² white space, expandable up to 4600 m²

100% hydroelectric energy up to 200 MW

Very reliable power grid: Only one 2 min outage in 36 years

100% free cooling, PUE 1.03

Waste heat reuse in the district heating system of Kajaani city

effective energy price 35-40 €/MWh

negative CO₂ footprint: 13500 tons reduced every year

Extreme connectivity: Kajaani DC is a direct part of the Nordic Internet backbone.

4x100 Gbit/s to GEANT in place, can be easily scaled up to multi-Tbit/s level

Elevated security standards guaranteed by ISO27001 compliancy

Numbers of LUMI

Cost-efficiency

204 M€
total budget

149 M€
system acquisition
budget

6
years
of operation

Sustainability

100%
carbon-neutral electricity

100%
free cooling

-13 500 tons
CO₂ emissions each year

Collaboration

9
country
consortium

19
Top-50
entries

user base of
20 000
users

Leadership-class system

220
Pflop/s

1+
TB/s I/O

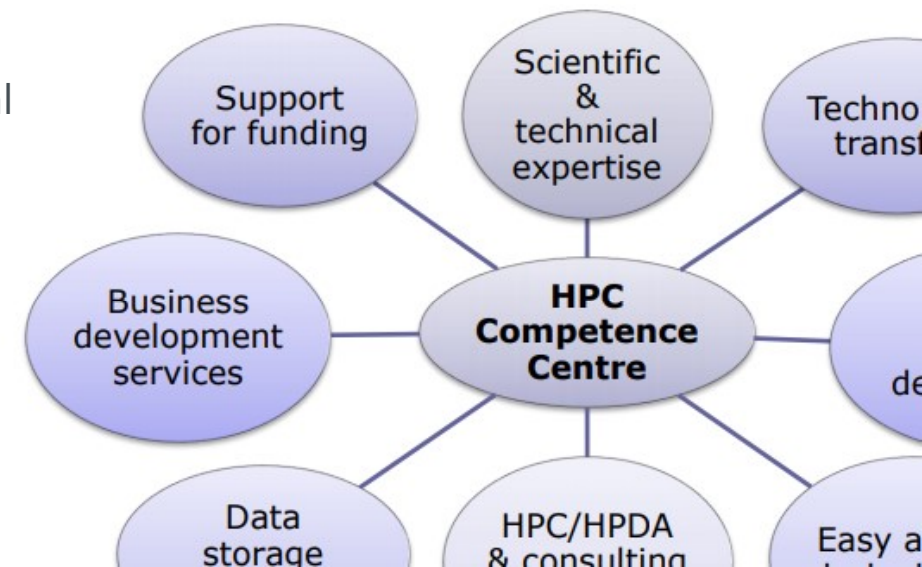
1
system

Agreements and Schedule

- Hosting Agreement signed in November (CSC, EuroHPC JU, DG Connect)
- Grant Agreement received from the JU on Nov 26. Submitted back with a set of comments on Nov 29.
 - The agreement is quite close to completion and expected to be signed in December 2019
- Consortium Agreement
 - Implementing partner feedback and implications from the GA
 - Expected to be signed in December 2019
- Procurement project started last week, expected decision summer 2020
- Operation of LUMI infrastructure planned from beginning of 2021

Other EuroHPC activities: competence centers

- EuroHPC competence centers - the concept
 - One center per member state, associated with national supercomputing centers
 - On demand services and tools to users
 - Access to the HPC innovation ecosystem, and to the supercomputers
 - Access to skilled technical experts
 - Training and outreach activities
 - Networking and coordination with other competence centers
- Volume 1 M€/year per country, starting 2020



Finnish investments to HPC: National 39 + LUMI 50 MEUR

- Why does Finland invest?
 - There is a long tradition in HPC in Finland, we believe we will get the resources fast in efficient use
 - AI is one of the national focus areas ("targeted to be the best country to apply AI")
 - There is competitive advantage in the platform (datacenter, environmental, cost, ...) and we believe this to result additional business – Ecosystem thinking
 - Excellent consortium in LUMI
 - We are not just looking for the capacity, but the most important thing is to strengthen the competencies – the people and their skills
 - And we just could not resist the temptation... 😊
- ***Looking for a world-class HPC Ecosystem.***