CERN Innovation Programme on Environmental Applications

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CHIPP/CHART Workshop on Sustainability in Particle Physics

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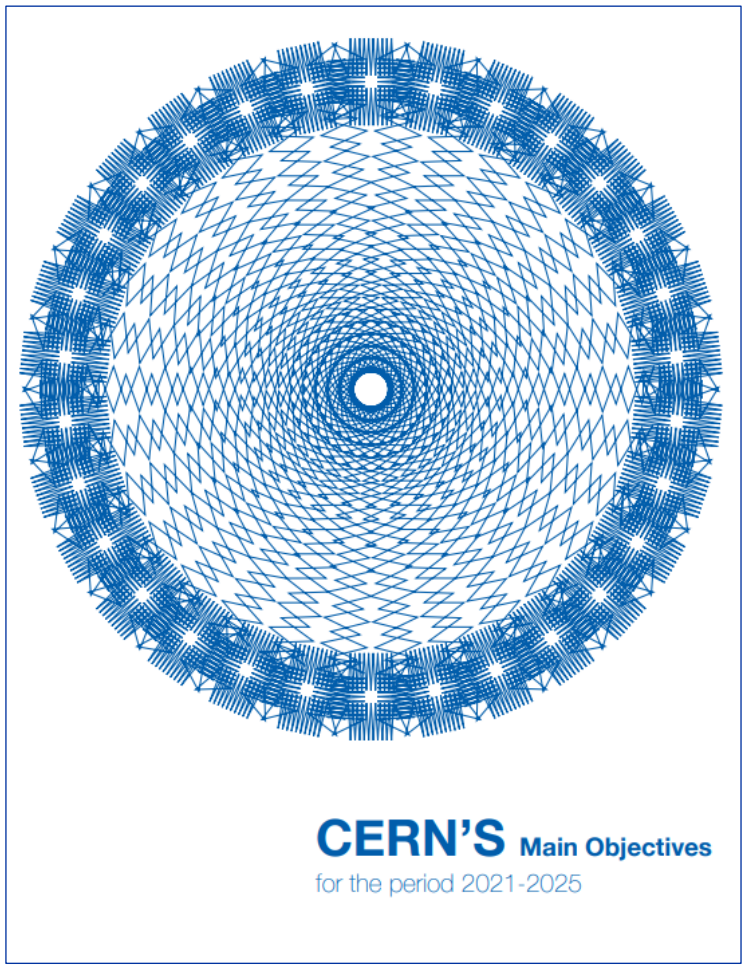
Environment: a clear priority for CERN and all its MS



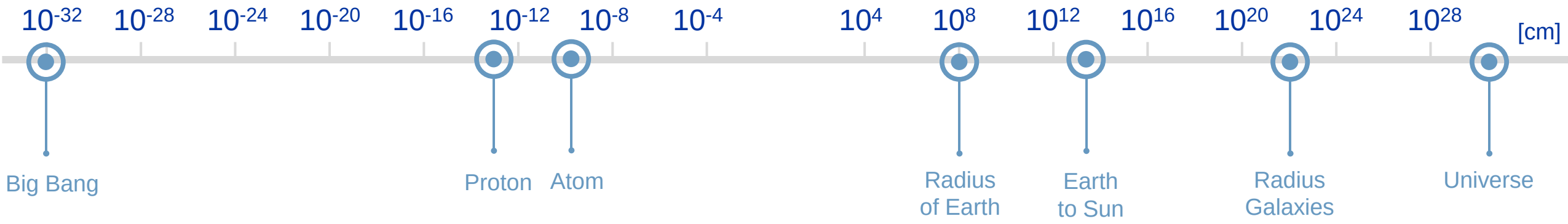
- Raising awareness on climate change causes and consequences
- Sharp increase in energy cost due to current geopolitical situation
- Growing importance of clean-tech innovation for competitiveness

Minimise the Laboratory's impact on the environment by implementing CEPS recommendations and defining a Green Procurement strategy

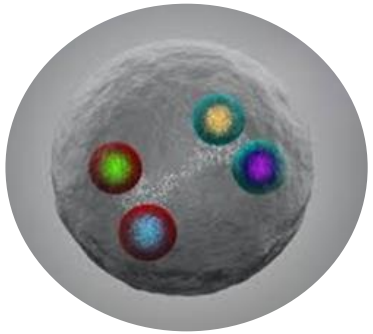
Identify, develop and transfer CERN's technologies that may contribute to tackling environmental issues on a global scale => CIPEA and KT

Pursue actions and technologies aiming at energy saving and reuse, under the supervision of CERN's Energy Management Panel

The Question



CERN can help to explore the secrets of matter



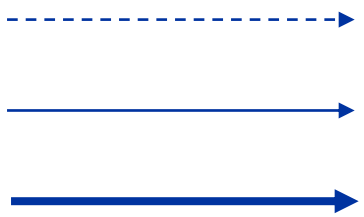
CERN can help to understand the mysteries of the universe

Can CERN help to tackle climate and environmental issues on a global scale?

The Answer

Combination of different factors:

- *Enhanced Sobriety*
- *Technology Improvement*
- *Innovative Disruption*



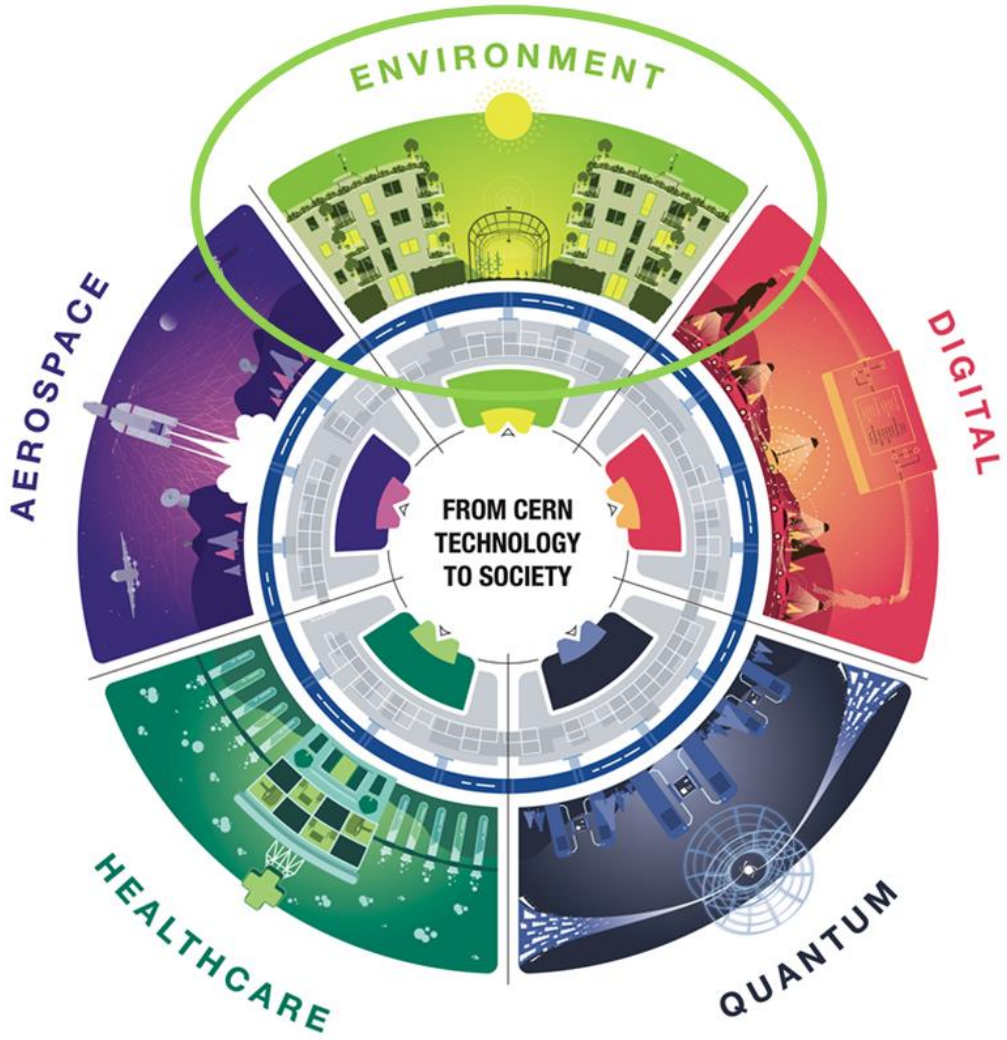
CIPEA CERN Innovation Programme on Environmental Applications

Harnessing CERN's unique skillset to help preserve the planet

- Initiative endorsed by the Director General and the Enlarged Directorate in January 2022
- Supported by HSE unit in the frame of CERN's Year of Environmental Awareness
- Coordinated by the Knowledge Transfer group to maximise positive impact on society

Entirely based on the ingenuity and expertise of CERN technical departments and community

Environmental Applications: Ideation and Implementation



News › News › Topic: At CERN

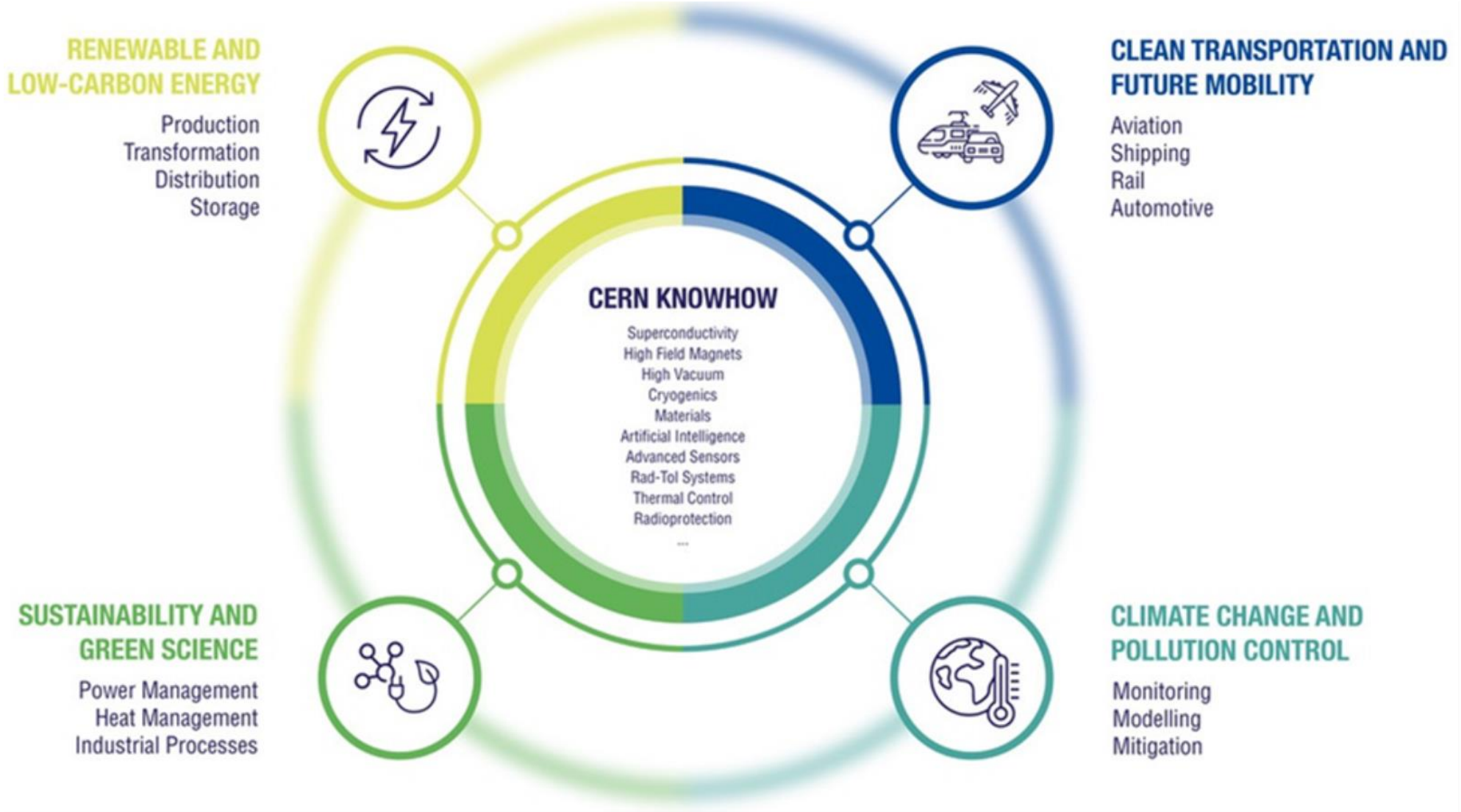
Promising start for future environmental applications of CERN technologies

On 27 June, the CIPEA Innovation Day welcomed 15 innovative project proposals reflecting the CERN community's commitment to tackling environmental challenges

12 JULY, 2022 | By Antoine Le Gall

The CIPEA Innovation Day brought together experts from all CERN technical departments. (Image: CERN)

CERN Environmental Applications Strategy



Examples of projects under implementation

RENEWABLE AND LOW-CARBON ENERGY

Support to innovative compact magnetic confinement fusion reactor developments

CLEAN TRANSPORTATION AND FUTURE MOBILITY

Demonstrate advanced SC power distribution systems for future electric/hybrid planes

CLIMATE CHANGE AND POLLUTION CONTROL

Develop Artificial Intelligence and Quantum Computing algorithms for Earth Observation

SUSTAINABILITY AND GREEN SCIENCE

Optimise infrastructure operation using motor sensors and digital twins

CIPEA – 2022 Call for Ideas

- **>30 Ideas discussed**
- **15 Proposals submitted**
- **8 Projects under implementation**

CIPEA – 2022 selected projects

SF6-free S-band circulator for photo injectors

Web Energy: Energy, water and gas monitoring and forecasting platform

EMP2: Environmental Modelling and Prediction Platform

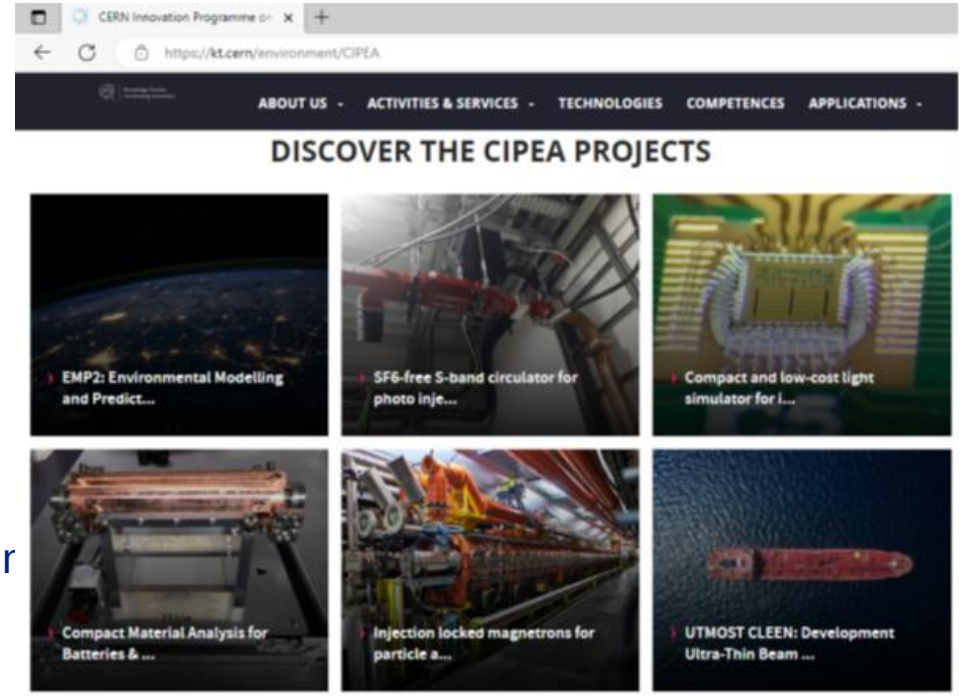
Compact and low-cost light simultor for indoor photovolataic cells development

UTMOST CLEEN: Development of membranes for ships EBFGT

Compact Material Analysis for Batteries & Fast Fuel Cell Development

Injection locked magnetrons for particle accelerators and industrial dielectric heatir

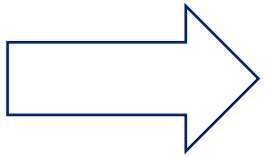
IVAC-RED: Insulation Vacuum of SC Cables for Renewable Energy Distribution



https://kt.cern/environment/CIPEA

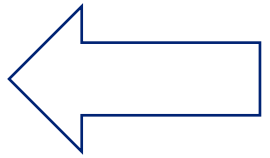
CERN Poles of Competence in Environmental Applications

Member States environmental priorities and national strategies towards the ecological transition



CERN assets:

- **Hub of experts with critical know-how**
- **Unique facilities**
- **Relevant IP**

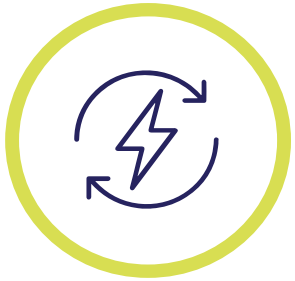


Technology trends and industrial clean-tech R&D agendas

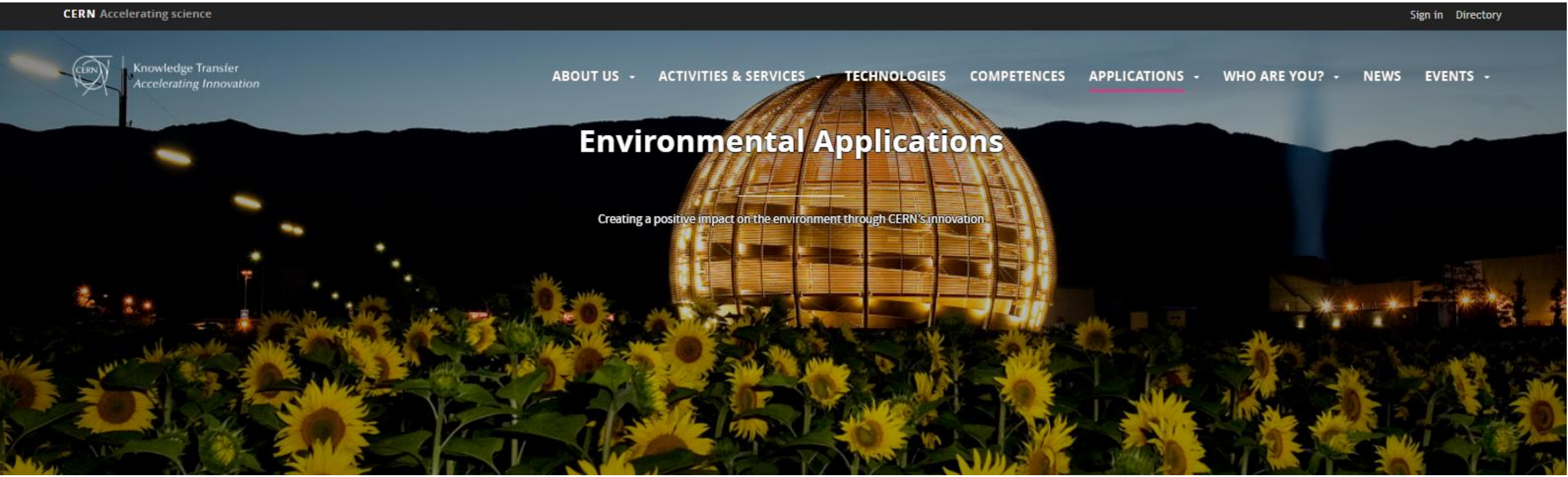
Many Poles of Competence preliminarily identified -
Ranking based on quantitative and qualitative criteria:

- number of running activities
- projects in preparation
- expressed industry needs
- impact potential

Highest Priority CERN Poles of Competence in Environmental Applications

	**Compact Magnetic Confinement Fusion Energy Systems**	**SC Lines for On-board and Grid Power Distribution**	
	Accelerator Driven and Advanced Nuclear Reactors	Liquid Hydrogen Storage and Handling Systems	
	**Engineering Systems Optimized for Low Emissions and Energy Efficiency**	**Instruments and Facilities for Remote and In-situ Environmental Monitoring**	
	Fast, Low-power Computing Techniques based on AI	AI Platforms for Global Phenomena Modelling and Climate Simulations	

Thanks for your attention!



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