CERN Environmental Applications

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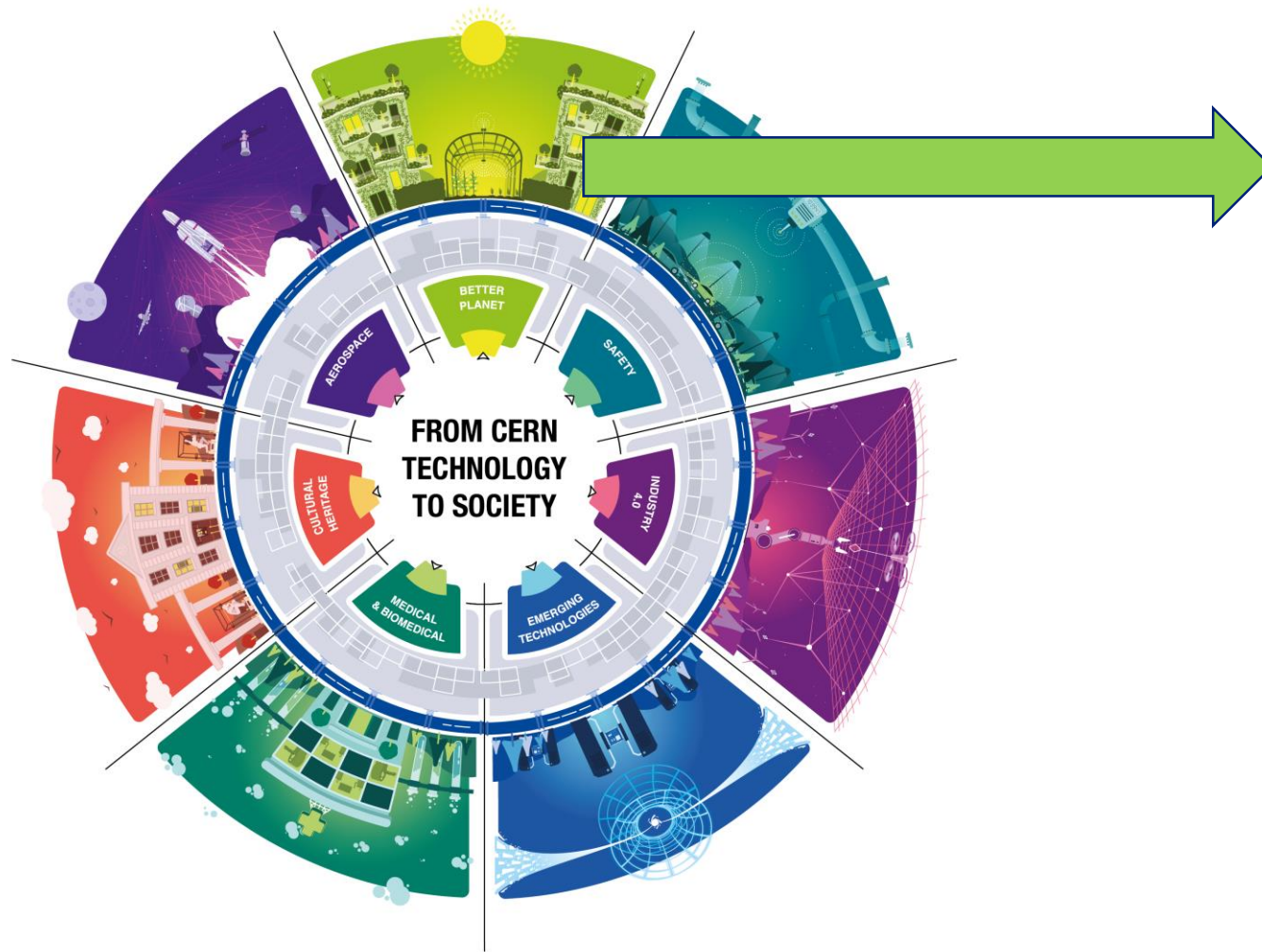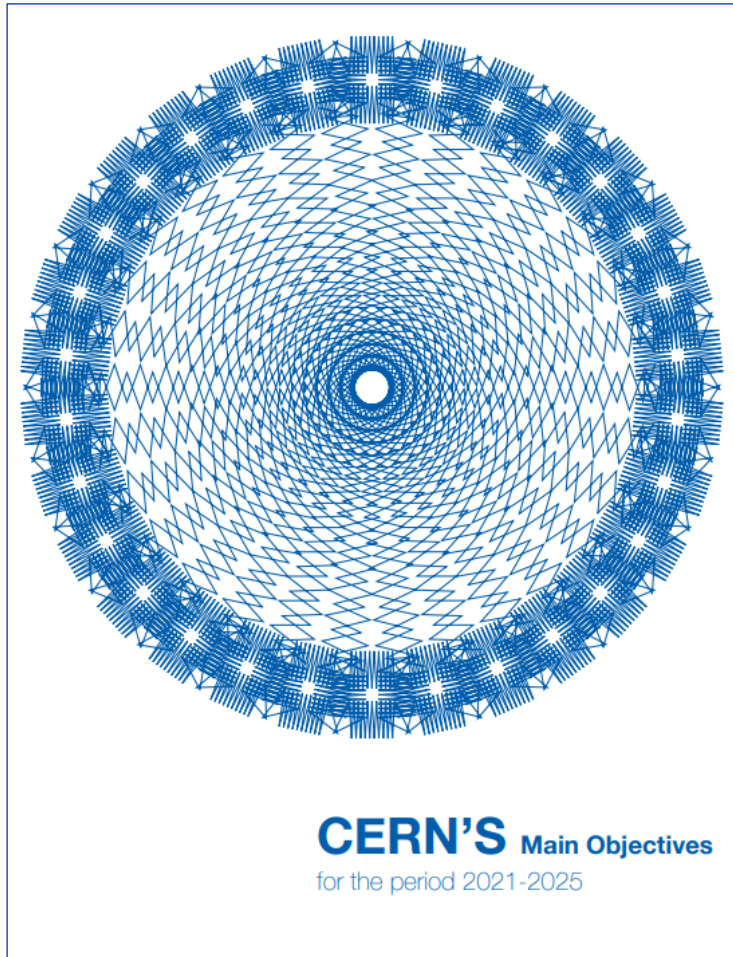
Meeting with Finnish ILO

25/05/2022

Environment: one of main KT fields of focus

Environment: a clear priority for CERN

CERN'S Main Objectives
for the period 2021-2025

Identify and develop CERN's technologies that may contribute to mitigating the impact of society on the environment

Minimise the Laboratory's impact on the environment

Pursue actions and technologies aiming at energy saving

Environmental Applications: Key Areas for CERN

RENEWABLE AND LOW-CARBON ENERGY

Production
Transformation
Distribution
Storage

CLEAN TRANSPORTATION AND FUTURE MOBILITY

Aviation
Shipping
Rail
Automotive

CERN KNOWHOW

Superconductivity
High Field Magnets
High Vacuum
Cryogenics
Materials
Artificial Intelligence
Advanced Sensors
Rad-Tol Systems
Thermal Control
Radioprotection
...

SUSTAINABILITY AND GREEN SCIENCE

Power Management
Heat Management
Industrial Processes

CLIMATE CHANGE AND POLLUTION CONTROL

Monitoring
Modelling
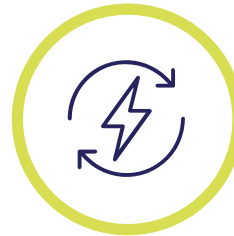Mitigation

Examples: Renewable and Low-Carbon Energy

Technologies for green hydrogen production, transport and storage
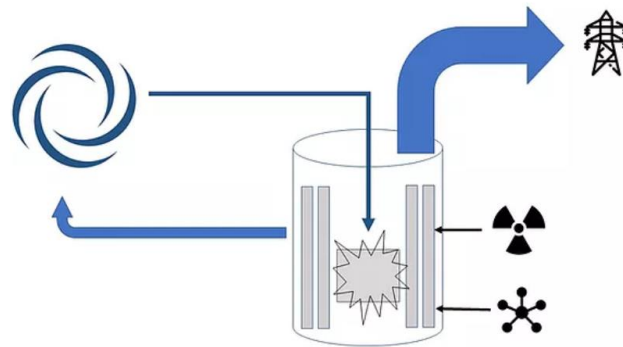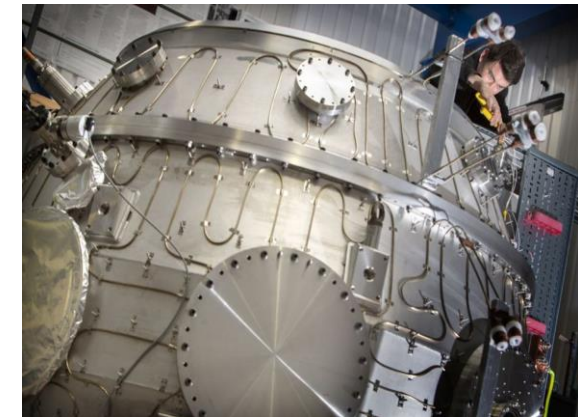

High performance solar panels

Advanced wind turbines

Compact nuclear reactors and ADS

Superconducting links

Fusion systems based on HFM

Examples: Clean Transportation and Future Mobility

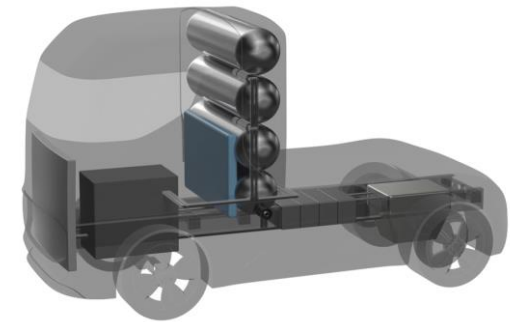Advanced power distribution systems for future electric/hybrid planes

High speed rail systems

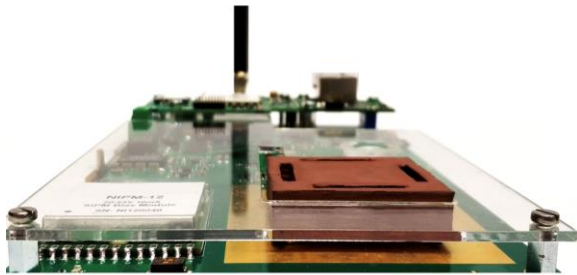Software solutions for autonomous driving with minmal consumption
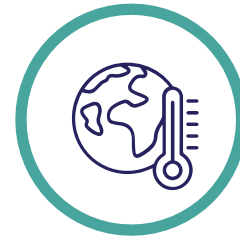
Decarbonized or low emission maritime vessels

Hydrogen tanks and fuel cells for long-haul trucks or small planes

Examples: Climate Change and Pollution Control

Distributed sensors for ground/air monitoring of physical parameters

Instruments, technologies and facilities for enhanced remote sensing and Earth observation

Accelerator systems for exhaust gas treatments

AI, QC and big data handling for global scale digital twin modelling

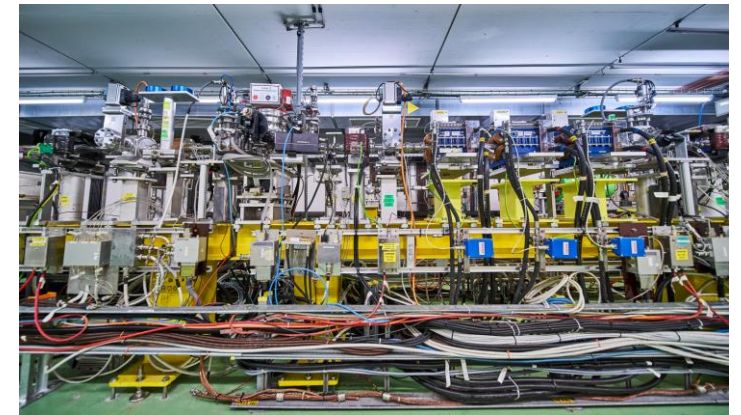# Examples: Sustainability and Green Science

Advanced cooling systems based on CO2

Fast computing power saving techniques

Infrastructure operation optimisation

High efficiency x-band klystrons and circulators

CERN Environmental Applications - possible R&D opportunities with Finnish companies - brainstorm

Bioenergy production:
Geneset ?

Biofuels:
Doranova / Vantaa ?

Monitoring (earth observation instruments):
Iceye ?

Mitigation (water treatment):
Econet ?

Green hydrogen ferry systems:
Flexens ?

Data center power management solutions:
TUNI ?

Thanks for your attention

Don't hesitate to get in touch !

https://kt.cern/environment/

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