# Workplan for magnets WP7 task3

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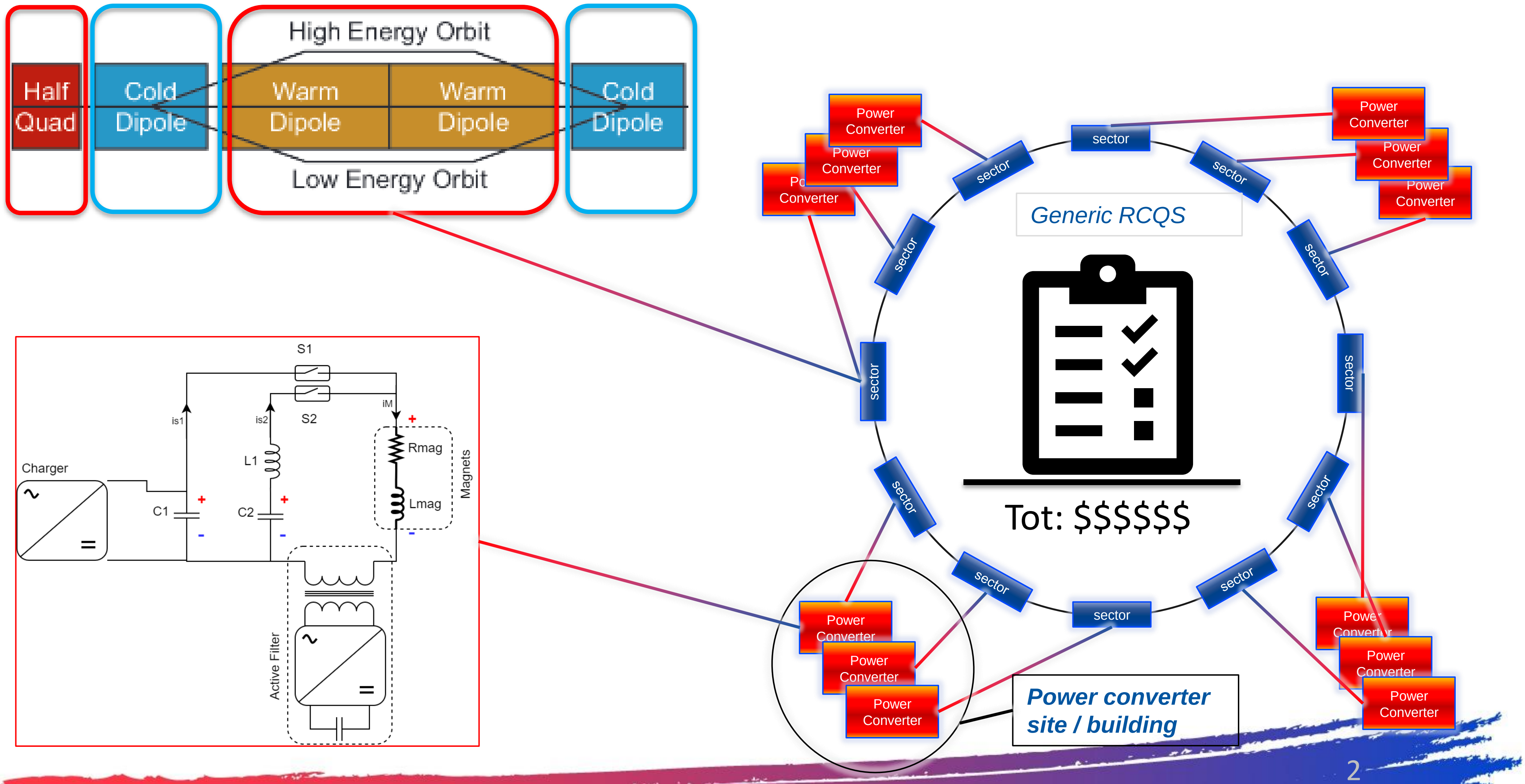
# Task 3: Accelerator magnets and powering system

International MUON Collider Collaboration

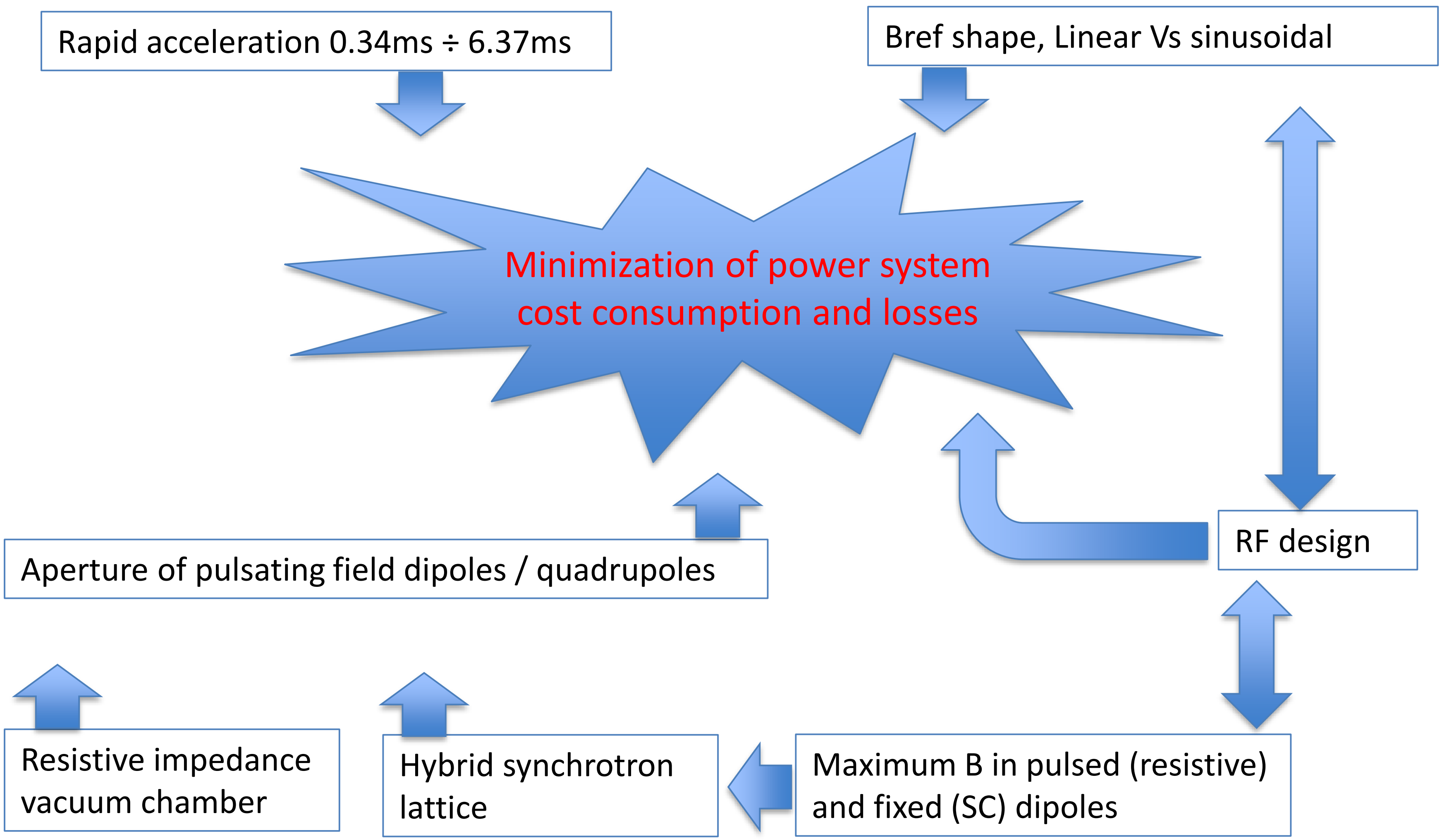
***General Goal for 2026:*** magnets + powering design for 10TeV with 3TeV stage with conceptual design of magnets and estimation of power system cost and total losses and land occupation.



# Task 3: Accelerator magnets and powering system

***Numbers:*** $\mathrm{NRG} \approx 10 \div 100MJ;\ PW_{pk} \approx 10 \div 50GW;$ Optimization required

$T_{ramp} \approx 0.5 \div 10ms;\ f_{rep} \approx 10Hz$



# Task 3: Activities and cooperating bodies

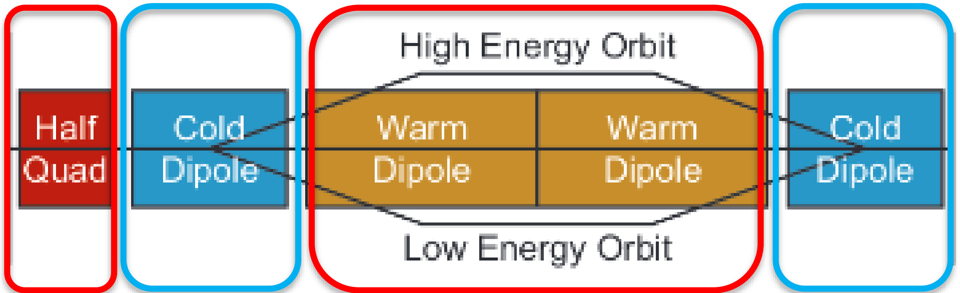
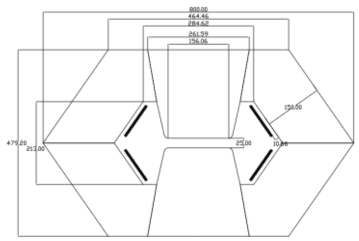


Figure 1: Rapid Cycling Synchrotron - Lattice.

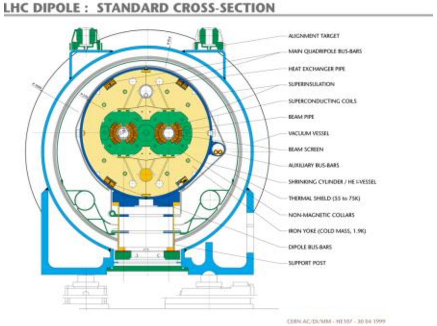
## Resistive magnets

- Optimal design of resistive dipoles and quadrupole with emphasis on minimization of energy content (UNIBO)
- Mathematical models of magnets' energy, losses and saturated behaviour (TU Darmstadt)
- Integrated power system / magnets optimization to minimize the total power requirements /cost and land occupation (CERN, LNCMI)

Dipole MAP design 156mmx25mm, ±1.5T



LHC Dipole. Niobium-titanium, 8.33T, Ø56mm gap

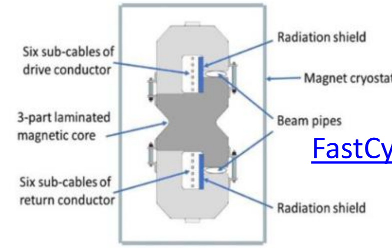



## Superconductive magnets LTS

- Initial hypothesis based on [8-10T) magnets (Niobium-Titanium)
- Questions to be answered:
  - What happens if we accept 8T?
  - What aperture / winding distribution should we consider?
- Basic electro-mechanical 2D design (CERN, UNIBO)

## Superconductive magnets HTS RCS4 10TeV

- Scooping studies for dB/dt in the range of 300T/s and Bgap > 2T (U-TWENTE, FNAL potential cooperation)



FastCyclingHTS: H.Piekarz et Al

# Task 3 – Milestones and deliverables for 2026