



# 5-year plan: Components and test

High level objectives and  
deliverables

- The purpose of this section of the plan is to perform experimental tests and hardware development in order to inform the MC ZDR (and NF RDR), demonstrate technology and allow cooling channel down-selection.

- The plan is divided as follows
  - MICE (US commitments)
  - Cooling channel RF
  - Magnets
  - Cooling channel sections and tests
  - Target
  - Related R&D

- Short term feasibility demonstrations
  - Highest priority. Focus in first few years
    - Demonstrate RF in magnetic fields
    - High pressure RF test with beam
- Existing commitments
  - Already ongoing. Need to follow through on our contributions.
    - MICE

- Intermediate term development
  - High priority. May be contingent on short term results. Ramping up with focus in the later years.
    - Helical solenoid magnets
    - 6D Cooling channel section test
    - Preparations for a 6D cooling demo
- Long term development
  - Start now to get first indications for ZDR.
    - HTS high-field solenoid



# MAIN OBJECTIVES



- Establish the limits of RF gradient versus magnetic field for vacuum cavities using various surface treatments and materials.
- Establish the limitations of High Pressure RF cavities in the presence of a beam.
- Prototype and bench test at least one section of a 6D cooling channel with RF that operates within these limits.
- Perform other hardware R&D that can inform the ZDR & RDR effort

# BUDGET PROFILE

	FY08	FY09	FY10	FY11	FY12	TOTALS
<b>Components &amp; Tests</b>	<b>7528</b>	<b>10500.5</b>	<b>9225.5</b>	<b>8201.5</b>	<b>4962.5</b>	<b>40418</b>
M&S	2070	2906	2291	2136	1135	10538
SWF	5458	7594.5	6934.5	6065.5	3827.5	29880

- On average roughly 3 times the present level, and requiring about half of the total resources requested for executing the plan.
- Note that planned R&D items tapers off in the out years. It is expected that new initiatives would pick up here and the overall effort continue to grow.

- Aim is to make the best possible case for muon collider in ~2013 with realistic resources (x3 increase).
  - Show 4D cooling in MICE
  - Demonstrate technical feasibility of critical parts in a Muon Collider
  - Prepare for a 6D cooling demonstration
- For more detail, see <http://apc.fnal.gov/groups2/MCCC/>