

# Workshop Summary

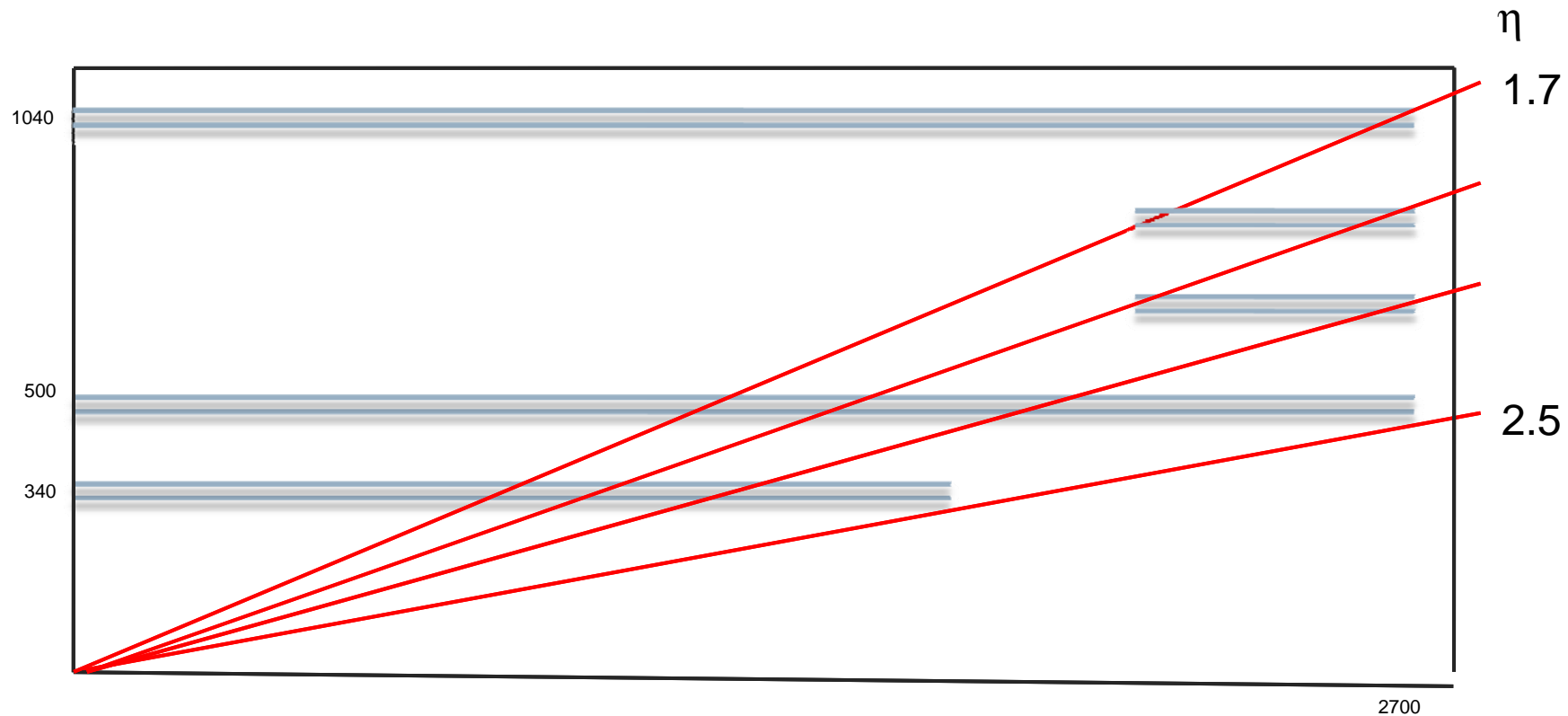
# Workshop Summary

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- ▶ Excellent levels of attendance and quality of discussion indicate what a success this meeting has been
  - ▶ Some ideas have generated controversy
    - ▶ Good to think outside of the box – CMS has been successful by being ambitious
- ▶ Real progress has been made in identifying key areas to focus effort on in the coming months
  - ▶ Also a chance to look at “cross-disciplinary” areas
- ▶ Thanks to Joel, and the local CMS team for support

# Example: Layout for the Tracking Trigger Project

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A conceptual layout for a tracking detector was proposed  
Tracker produces stubs to feed the Trigger  
Trigger groups to understand what could be achieved with stubs  
Layout concept for stacked rods proposed – study groups to look at the  
practical aspects

# Basic Units for Tracking Trigger Project

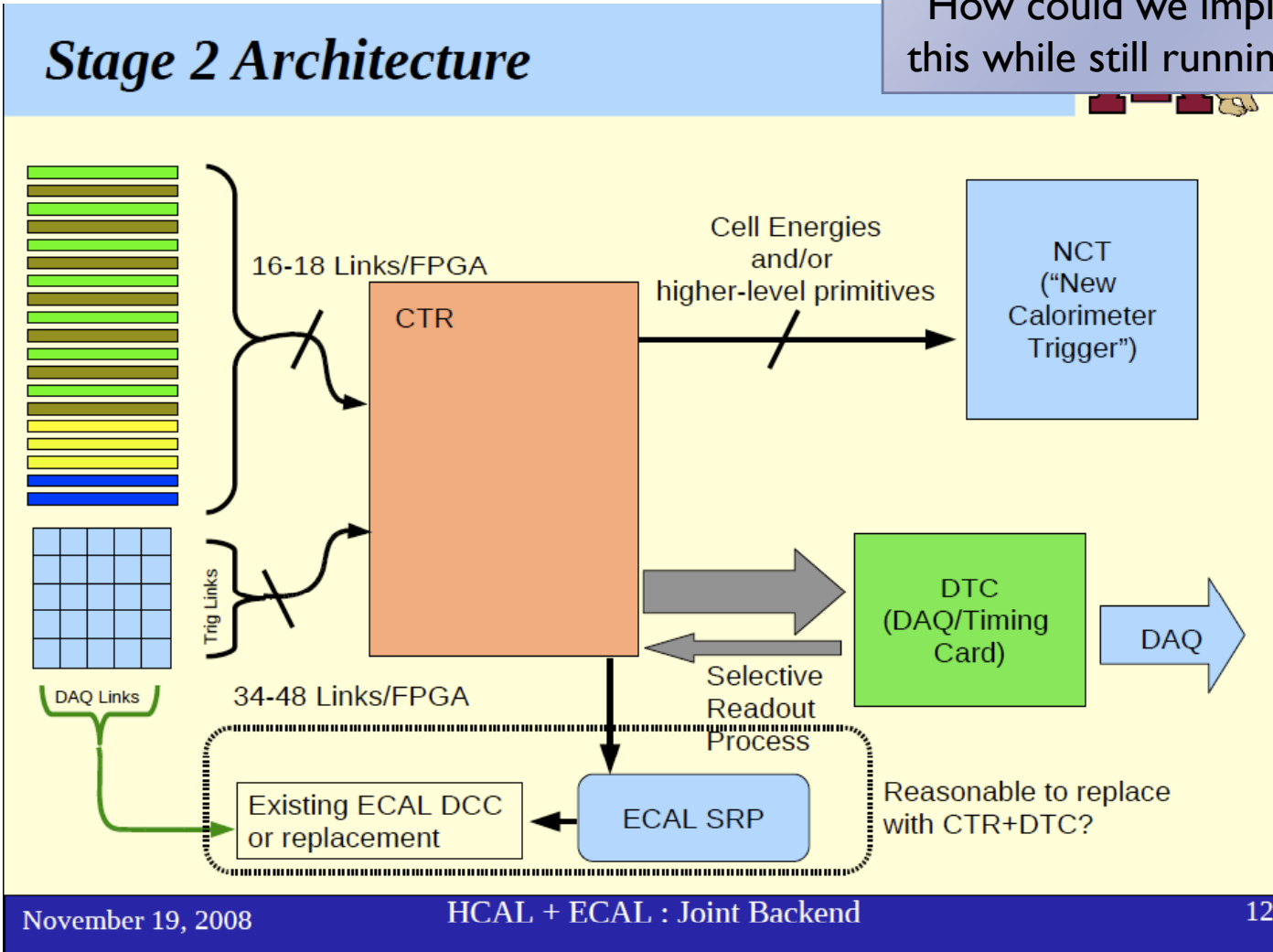
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- ▶ **Module Design**
    - ▶ Sensor, FEE, Interconnection, On Module Processing, Construction
  - ▶ **On Rod Data Transmission**
  - ▶ **On Rod Processing**
  - ▶ **Off Detector Data Transmission**
  - ▶ **Off Detector Processing**
  - ▶ **FEDs and DAQ system**
  - ▶ **Powering and DCS System** (Grounding and Shielding)
  - ▶ **Cooling System**
  - ▶ **Mechanical Layout and Structures**
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- Simulation and System engineering and optimization
- Overlap with Phase I effort



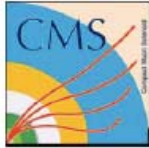
# Possible Common ECAL/HCAL Off Detector Electronics

Is this the right direction?  
How could we implement this while still running CMS?



J. Mans

# Detailed list of tasks:Tracker



## Next six months



- **PSI**
  - Detailed design of new BPIX mechanics
  - Fabricate rapid prototype model and cassette with rails for insertion tests
- **CERN**
  - start conceptual CO2 cooling design verification test
  - test setup for measurements and characterization of CO2 flow in small tubes
- **FNAL**
  - continue to work with thermal analysis to determine optimum tube size
  - calculate heat leak and pressure drop in supply / return lines
  - Investigate chillers and centrifugal pumps
  - Further FEA checks on thermal stresses and displacements with module glued on substrate
- **Purdue**
  - Continue study of module, cooling tube and electronics layout with FNAL to optimize mechanical design
  - Test radiation hardness of candidate adhesives/thermal interface materials
  - Begin integration of optics, vacuum, and glue dispensing to motion control system (on order) for semi-automated module assembly
  - Prepare to assemble mech grade module prototypes to evaluate adhesives, interconnects, and develop assembly tooling and procedure

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# ME4/2 Upgrade Schedule

- ▶  $t_0$  -- CD2 approval, money flows, begin work on Bldg 904
- ▶  $t_0+3$  months -- orders sent out for all parts
- ▶  $t_0+6$  months -- production tooling shipped to CERN and assembled in Bldg 904
- ▶  $t_0+9$  months -- chamber parts delivered, shipped to CERN
- ▶  $t_0+12$  months -- production begins at Bldg 904 at 2 CSCs/month
- ▶  $t_0+15$  months -- production ramps to 4 CSCs/month
- ▶  $t_0+18$  months -- FAST site begins assembly & testing at CERN (Bldg 904?), spare CFEB boards installed on ME4/2s
- ▶  $t_0+24$  months -- 42 CSCs finished and tested -- ready for installation of 1st endcap, recover 200 CFEB boards from ME1/1s
- ▶  $t_0+33$  months -- all 76 CSCs finished
- ▶  $t_0+36$  months -- final 36 chambers ready for installation on 2nd endcap



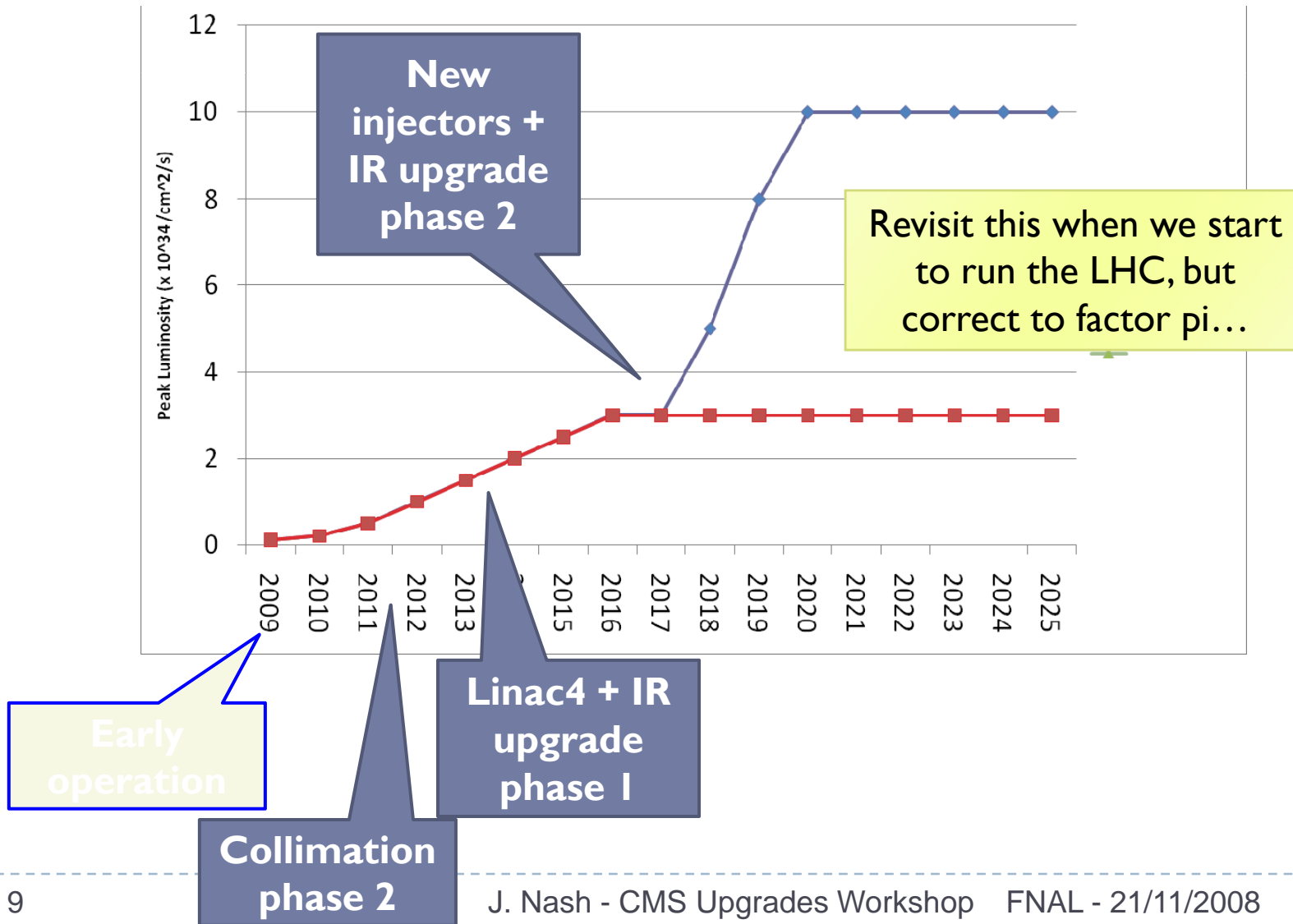
# Future meetings

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- ▶ **ACES – 3,4 March 2009 CERN**
  - ▶ Focus on electronics for trackers
- ▶ **Upgrade Days**
  - ▶ Meetings scheduled once per month
    - ▶ Keep momentum
    - ▶ Track progress
  - ▶ <http://indico.cern.ch/categoryDisplay.py?categId=2024>
  - ▶ Topics which cross detector groups, or go into depth on a particular topic
    - ▶ Examples : Sensor R/D, HCAL/ECAL common readout electronics, tracking trigger issues
- ▶ **Upgrade Workshop 13-15 May 2009 CERN**

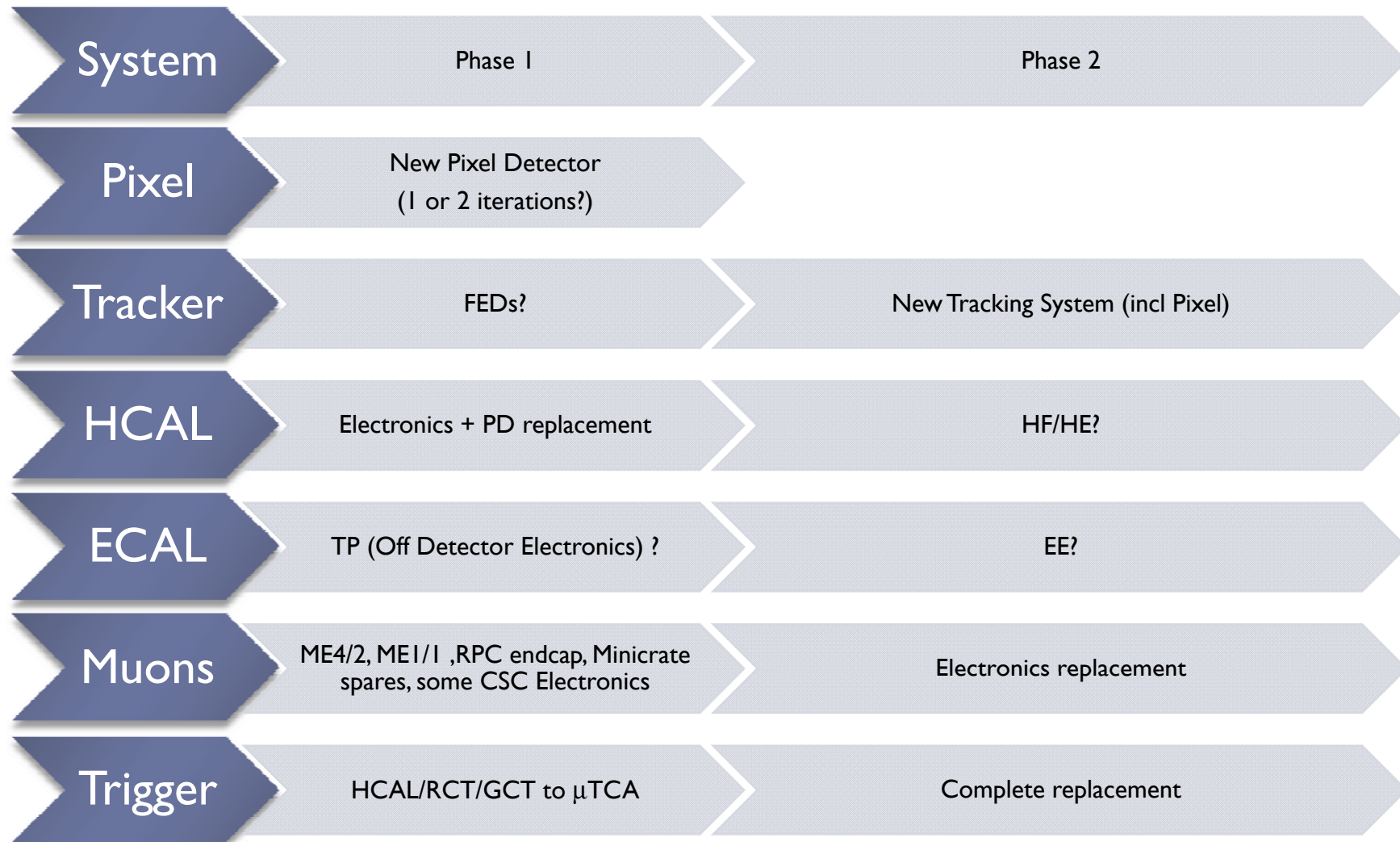


# Scenario for Peak luminosity...



# Upgrade Scope

Clear progress on Phase I ambitions – now need to work towards realistic planning



# Documents

Will we be ready for these dates?  
Are they still appropriate?

