Goal of this Process

- The overarching goal for the future projects roadmap
  - "Make sure the detectors are not the show-stoppers"
    - And make sure that we can demonstrate that
  - What do we need to do *in the next five years* to make sure the correct decisions are taken at the next Strategy Update?
    - And to make sure we are on top of the technologies required to implement the outcome?
- The roadmap report
  - Summary of the information and views gathered during the process
  - Prioritised list of R&D topics for the coming years
  - Recommendations on how to implement the roadmap
- Timeline from this point on
  - Spontaneous inputs from the community are still very welcome
    - Either via the survey, or focussed comments via Questionnaire-TF7-ECFA-DetRDRMap@cern.ch
  - As we discuss priorities / organisation, will need to consult further
    - We are not experts on all relevant topics
    - Focussed further discussions or conversations are likely to be needed
  - The consultation 'closes' and report writing starts around 7th May
    - Of course this is just the start of the discussion…

"Matrix" Approach

		Front end	Integration	Back end
1	HL-LHC	●	●	●
2	Long-baseline neutrinos	●	●	●
3	ee collider	●	●	●
4	Hadron collider	●	●	●
5	Muon collider	●	●	●
6	Other accelerator-based physics	●	●	●
7	HI colliders	●	●	●
8	Non-accelerator physics	●	●	●
9	Test beams, facilities	●	●	●
10	Infrastructure and tools	●	●	●
11	Collaboration	●	●	●
Key	● Clear driver / show-stopper for future work			
	● Important factor for future work - basic R&D needed			
	● Relevant - incremental R&D needed			
	● Could be done today - modest R&D needed			
	Empty: not relevant			

- A crude way of established relevance and priority – perhaps too crude to be useful
  - Clear that the horizontal and vertical bins contain a lot of hidden detail and complexity
- Would everyone agree on the 'priority map'?
  - Input from both experiments and technology experts needed here
- Do we need a 'time axis' - i.e. what needs to be done *now* and what can wait?

What have we Learnt?

- Observations based on the input so far
  - Overwhelming number of topics where work is justified and relevant
  - Organisation / sociology /efficiency seems to be a key concern
  - Careers, training and engagement are a vital consideration (-> TF9)
- Several cross-area themes in the input and at this workshop
  - Increasing complexity of COTS processes / technologies
  - We are not drivers for industry in most (any?) areas
  - Lack of standards, design re-use and verification focus is hurting us
  - Development-for-sake-of-development is hard to justify
  - 'Holistic' / full-system design before choosing technologies would be wise
- Positive points
  - There are a large number of new ideas and developments
    - We are far from intrinsic limits of technology in most cases (may be near the limit of our $$$)
  - There may be new and clever ways out of 'show stopping' problems
  - We clearly have giant challenges (which will attract good people)
  - There are opportunities for more cooperation and 'federalism'
  - We seem to broadly agree on the issues facing us!

Towards a Roadmap

- Part 1: Listing and prioritisation of R&D topics
  - Did we miss anything? Surely we did…
  - We will learn more about 'requirements' in the following symposia
- Part 2: A number of difficult non-technological questions
  - What are the most *important* challenges the European Strategy presents?
  - What is the balance between pragmatic R&D, against long-term / blue-skies R&D?
  - What should we should *not* be doing (i.e. can be done for us by industry?)
    - And what are the risks involved in this approach?
  - What is being done in other fields? Is it relevant?
  - Are there things we can no longer afford?
- Part 3: How do we do it?
  - What must be organised 'top down' versus 'bottom up' new ideas?
    - What new organisational structures do we need for R&D? Is it the same in all areas?
  - How can efficiency and re-use of work be best achieved?
  - How do we sustain a critical mass of expertise in our field?
  - How do we re-organise to deal with more and more complex technologies?
- Final word to Erik: "how to accommodate disruptive ideas in a roadmap?"
- Your input on all these matters is requested and vital