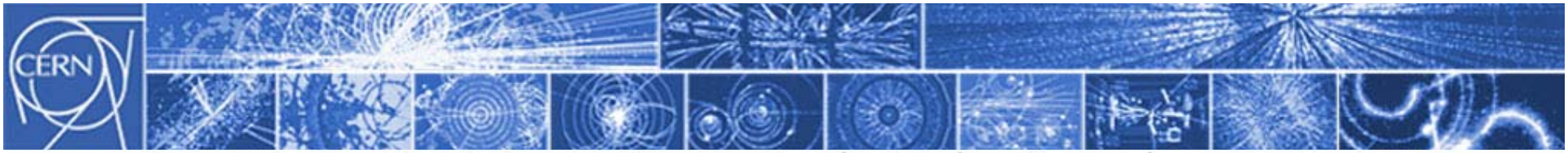


CERN

European Organization for Nuclear Research
Organisation Européenne pour la Recherche Nucléaire

CERN Readout Electronics – Transfer Opportunities and Conditions

H.Hillemanns

June 6th 2007

Technology Presentation Wrap-Up

Various microelectronics technologies available for many different application domains

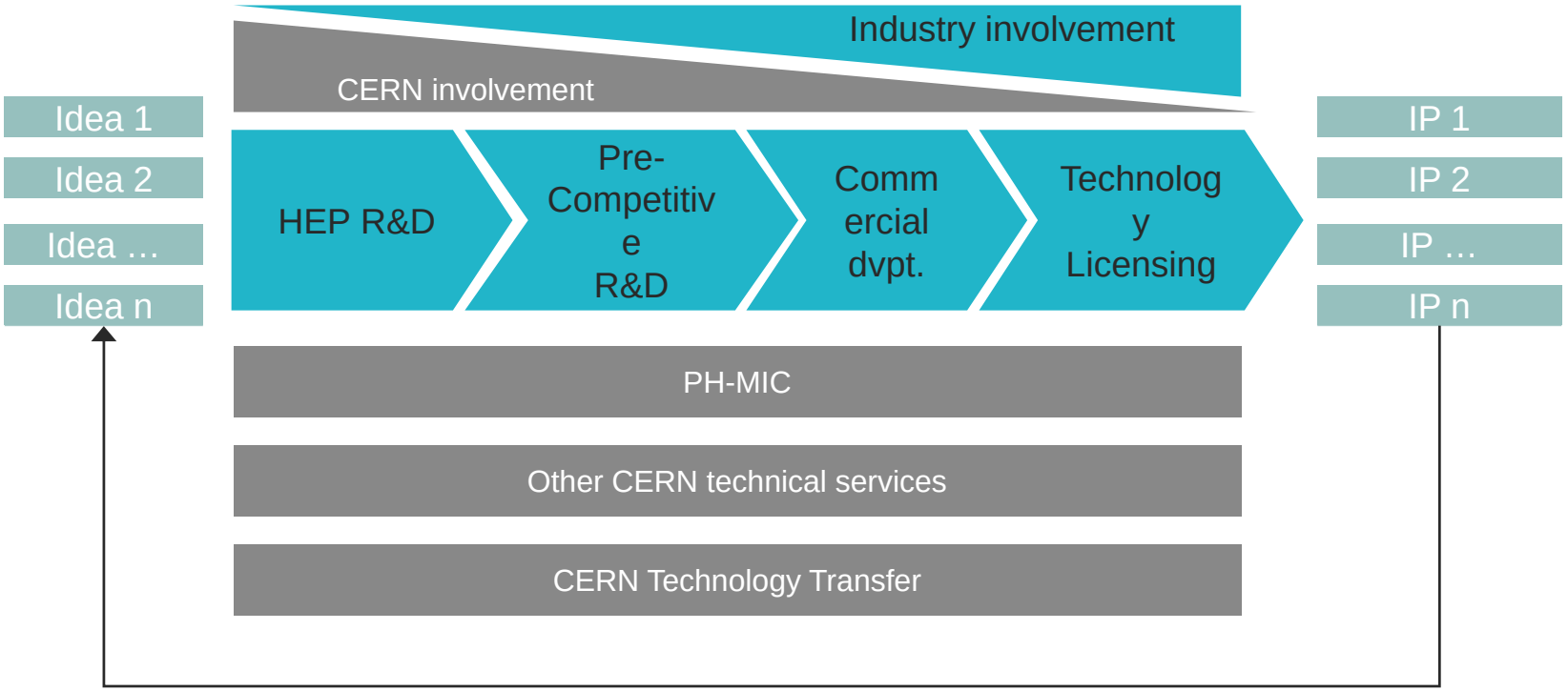
Different levels of availability

- Off the shelf
- Ready-to-use ASIC designs
- Design blocks of several existing ASIC's
- Prototypes
- Planned developments for HEP open for collaborative effort

➔ *Different levels of market readiness require different collaboration schemes*

Technology Value Chain

CERN can help to bridge the gap between science to market



Opportunity landscape (1/2)

Licenses

- General principles
  - Technology licensed on an “as-is” basis
  - Exclusive licenses are normally not possible
  - Military applications are excluded
  - R&D and/or commercial licenses
  - License normally attached to the chip
- Chip production aspects
  - Contract with IBM for 0.25 m CMOS technology
    - ends in 2009
    - restrictions on the use of the chips and, in particular, for medical imaging systems
  - Delivery of chips by CERN on a “best effort” basis
  - Other production approaches can be investigated

Opportunity landscape (2/2)

Collaborative R&D projects

- Development of commercial products based on CERN technology and/or expertise
  - Funding
    - No funding from CERN
    - Public funding are possible (CERN is eligible for European and national funding schemes)
    - Full cost recovery is essential but further incentives are required
  - Access to and exploitation of IP
    - The commercial partner usually have exclusivity on the results of the R&D project in his market and have access to CERN background IP in order to exploit the results
- Pre-competitive R&D (basic technology, feasibility studies, …)
  - Funding
    - CERN may cover part of the R&D costs depending on the interest for CERN's core R&D programme
    - Public funding are possible
  - Access to and exploitation of IP
    - The commercial partner usually have exclusivity on the results of the R&D project in his market and have access to CERN background IP in order to exploit the results
    - CERN and the Particle Physics community have access to the results
    - The commercial partner has access to CERN background IP in the framework of the project and in order to exploit the results
    - CERN has access to the background IP of the industrial partner for R&D purpose and to manufacture the components based on the results

Transfer Overview (1/2)

	Technology	NINO	HPTDC	Low noise feedback pre-amplifier	Fast Counting mode electronics	Medipix
Availability	On Stock	0.25µm, small quantities	0.25µm		DxRµCT_128AC (0.25µm), small quant.	Medipix2: Small quant.
	Production run	0.25µm,	0.25µm	0.25µm	All, 0.25µm	Medipix2: 0.25µm
Perspectives	Prototypes under study	0.13µm soon	0.13µm			0.13µm (Medipix3)
	Potential Redesign			0.13µm under study	All, 0.13µm	
Protection		Design	Design	Patent filed	Design	Design (Medipix 3 Patent filed)
Restrictions		No military applic.	No military applic.	No military applic.	No military applic., no CT, commercial use subject to partner approval	No military applic., use subject to collaboration approval

Transfer Overview (2/2)

Further specific technologies, services, support and consultancy can be considered upon request:

- Customer specific ASIC design
- ASIC production
- DAQ
- Integration and packaging with various sensors
- Characterization and testing
- Radiation hardening

Thank you for your attention

For questions and any further information, please contact

Hartmut.hillemanns@cern.ch or helpdesk-tt@cern.ch