

# EuCARD-2 3rd Annual Meeting

## Introduction and Activity Report

M. Vretenar, Coordinator  
Valletta, 26 April 2016





# Welcome to the 3rd Annual Meeting

From the Report of the EuCARD-2 Mid-Term Review, 9.6.2015

*«Wherever possible, meetings and workshops should take place at smaller institutes, laboratories and universities, in order to make EuCARD-2 activities more visible to broader stakeholder communities...»*



## ***Let's go to Malta!***

The smallest country participating in EuCARD-2.

An old and very active university, contributing since years to accelerator collimation studies.

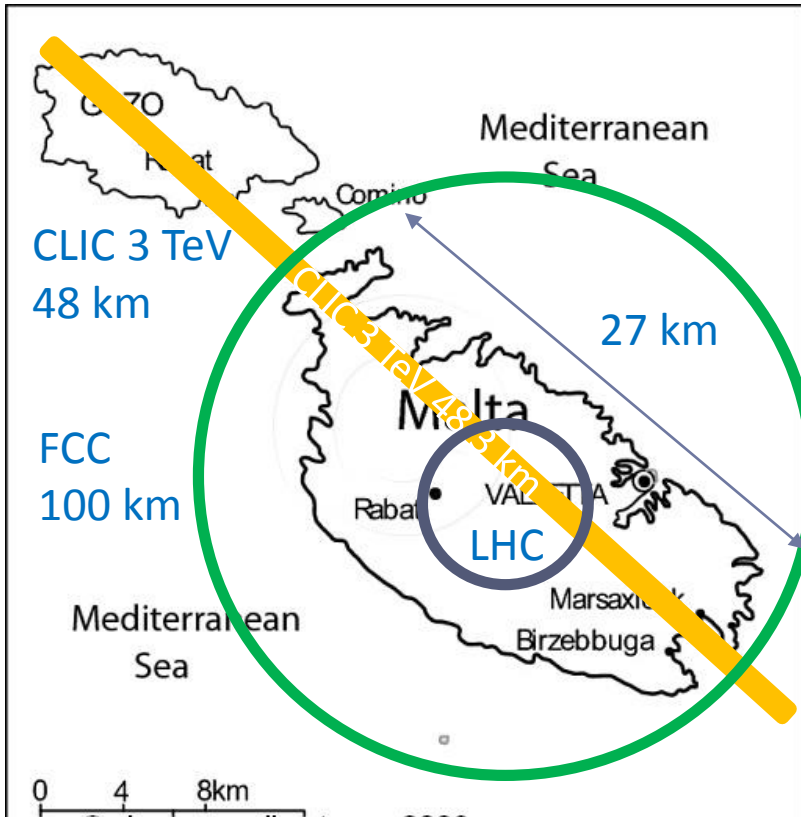
A mixture of cultures, well in the spirit of the EuCARD projects.

A country of history and tradition investing in technological R&D.

*With a great thank to Julia, Lucienne and Nicholas for organising the meeting*



# Malta: the size of the LHC



ELOISATRON (European Long Intersecting Storage Accelerator)  
 Study of INFN (A. Zichichi), c.a 1986  
 300 km, 200 TeV



# EuCARD-2: the European avenue to Accelerator R&D

## European Coordinated Accelerator Research and Development – 2

An Integrating Activity under FP7 (capacities – infrastructures) of European Commission

- >300 participants
  - 40 beneficiaries (Laboratories, Universities and Industries) from 12 European Countries (+ CERN and Russia)
- 4 years duration (01.05.2013 - 30.04.2017)
- 13 Workpackages covering advanced accelerator R&D topics
- Producing 62 Deliverables and 86 Milestones
- 23.5 M€ total cost, 8 M€ EC contribution (1/3)

One website:  
<http://eucard2.web.cern.ch/>





# The Annual Meeting – Programme (1)

DAY	START	END	DURATION	TITLE	SPEAKER	CHAIR
<b>TUESDAY 26/04/2016 EuCARD-2 Plenary Session</b>						
<b>1st Session</b>	09:30	09:40	00:10	Welcome from University of Malta	Prof E. Cachia, Dean of the Faculty of ICT	Ralph Assmann
	09:40	09:55	00:15	Welcome from EuCARD-2 Coordinator and activity report	M. Vretenar (CERN)	
	09:55	10:25	00:30	The University of Malta (20'+10')	N. Sammut (UoM)	
	10:25	10:35	00:10	EuCARD-2 Communication and Outreach: results and perspectives (10')	J. Toes (CERN)	
	10:35	11:00	00:25	Extreme Beams - report from WP5 XBEAM (20'+5')	F. Zimmermann (GSI)	
	11:00	11:30	00:30	<b>Coffee break</b>		
<b>2nd Session</b>	11:30	11:50	00:20	The EuPRAXIA project (15'+5')	R. Assmann (DESY)	Ursula Van Rienen
	11:50	12:10	00:20	Light Source upgrade projects (15'+5')	R. Bartolini (U. Oxford)	
	12:10	12:30	00:20	Synchrotron-radiation diagnostics - past and future (15'+5')	T. Mitsuhashi (KEK)	
	12:30	12:50	00:20	Visualising Plasma Accelerating Structures (15'+5')	M. Kaluza (University Jena)	
	13:00	16:00	03:00	<b>Harbour Cruise</b>		
<b>3rd Session</b>	16:00	16:10	00:10	The editorial series on accelerator science: overview and perspectives (10')	R. Romaniuk (TUW)	Susanna Guiducci
	16:10	16:30	00:20	MAXIV commissioning highlights (15'+5')	A. Andersson (MAXIV)	
	16:30	16:50	00:20	Ion Beam Cancer Therapy Using Helium (15'+5')	S. Green (QE Hospital)	
	16:50	17:10	00:20	Comparison of Energy Efficient Beam Transport Systems (15'+5')	D. Ondreka (GSI)	
	17:10	17:30	00:20	HTS Roebel Cables for the EuCARD2 "Future Magnets" (15'+5')	A. Kario (KIT)	
	17:30	17:45	00:15	ICTF at RAL, status and future opportunities (10'+5')	TBC	
	17:45	18:05	00:20	Novel Accelerators - report from WP7 EuroNNAC2 (15'+5')	U. Dorda (DESY)	
	18:05	18:25	00:20	The MagNet and HiRadMat facilities at CERN (10'+10')	M. Bajko & A. Fabich (CERN)	
18:25	18:50	00:25	Low Emittance Rings - report from WP6 LOW-e-RING (20'+5')	Y. Papaphilippou (CERN)		
	19:00	20:00	01:00	<b>SC Meeting</b>		
	20:00	22:00	02:00	<b>Dinner at Nenu's in Valletta</b>		

Usual structure with summary talks and invited highlight talks

Excellent choice of invited talks, with several contributions from non-EC2 participants

Exciting social programme (2 dinners, boat cruise)

Special Steering Committee meeting at 19:00

<https://indico.cern.ch/event/489475/>



# The Annual Meeting – Programme (2)

## WEDNESDAY 27/04/2016 EuCARD-2 Plenary Session

4th Session	09:15	09:40	00:25	Energy Efficient Accelerators - report from WP3 EnEfficient (20'+5')	M. Seidel (PSI)	Erk Jensen
	09:40	10:05	00:25	Accelerator Applications - report from WP4 AccApplic (20'+5')	R. Edgecock (STFC)	
	10:05	10:25	00:20	CLIC Crab Cavity Development (15'+5')	B. Woolley (ULAN/CERN)	
	10:25	10:45	00:20	Material Characterisation by POLITO (15'+5')	L. Peroni (POLITO)	
	10:45	11:15	00:30	Coffee break		
5th Session	11:15	11:40	00:25	Collimator materials for high-density energy deposition - report from WP 11 (20'+5')	A. Rossi (CERN)	Walter Wuensch
	11:40	12:00	00:20	Knowledge and Technology Transfer within EuCARD-2: report from WP2 (15'+5')	V. Skarda (STFC)	
	12:00	12:20	00:20	Outcomes of Thermal management materials workshop with industry (15'+5')	T. Tsarfati (CERN) + M. Kitzmantel (RHP)	
	12:20	12:40	00:20	Experiment at HiRadMat (15'+5')	F. Carra (CERN)	
	12:40	13:00	00:20	AMIT project at MagNet (15'+5')	F. Toral (CIEMAT)	
	13:00	14:00	01:00	Lunch break		
6th Session	14:00	14:25	00:25	Future magnets - report from WP10 (20'+5')	L. Rossi (CERN)	Alexander Ryazanov
	14:25	14:50	00:25	Innovative RF technologies - report from WP12 (20'+5')	P. McIntosh (STFC)	
	14:50	15:15	00:25	Novel Accelerator Concepts - report from WP13 (20'+5')	V. Malka (CNRS)	
	15:15	15:35	00:20	Electron Injection Schemes (15'+5')	C. Thaury (CNRS)	
	15:35	15:55	00:20	Tea break		
7th Session	15:55	16:15	00:20	Ion Beams for Space Propulsion (15'+5')	F. Taccogna (IMIP-CNR)	Roy Aleksan
	16:15	16:35	00:20	Highlights and roadmap from EuCARD-2 XPOL (15'+5')	K. Aulenbacher (JGU Mainz)	
	16:35	16:55	00:20	Structural Design of HTS magnet for EUCARD-2 (15'+5')	J. Murtomaki (U. Tampere/CERN)	
	16:55	17:15	00:20	The Kladiatron: A New High Efficiency Klystron Design (15'+5')	F. Peauger (CEA)	
	17:30	19:30	02:00	Governing Board & Steering Committee Meeting		
	19:30	20:30	01:00	Transport to Mdina		
	20:30	23:30	03:00	DINNER (Mdina)		

Wednesday:  
Governing Board, 17:30  
Bus leaving for M'dina walking tour and dinner, 17:30

Thursday:  
SAC Presentation 12:30-13:00

## THURSDAY 28/04/2016 PARALLEL SESSIONS and SAC report

	09:30	12:15	03:30	PARALLEL SESSION1	WP5, WP6, WP12, WP13, WP11 Topic
	12:30	13:00	00:30	SAC Report & Close-out	
	13:00			End of Plenary Meeting	
	13:00	14:00	01:00	Lunch break	
	14:00	18:00	04:00	PARALLEL SESSION2	WP11 Topical meeting
	14:00	17:00	03:00	VISIT OF University of Malta and ST Microelectronics	

Thursday afternoon:  
Parallel sessions and visits

Thursday-<sup>6</sup>  
Friday: WP11



# Scientific Advisory Committee

*We welcome the presence of two members of our Scientific Advisory Committee (SAC), Akira Yamamoto and Steve Peggs.*

The SAC contributions has been critical for the success of the Mid-Term Review of May 2015

The EuCARD-2 Scientific Advisory Committee (SAC) is an external advisory body composed of members with an international reputation endorsed by the Governing Board upon proposition of the EuCARD-2 Steering Committee.

This committee will receive the EuCARD-2 Yearly Activity Reports and is expected to meet at least once per year during the EuCARD-2 Annual Meeting.

The role of the committee consists in:

- Monitoring the scientific and technical activities and advising the EuCARD-2 management in case of possible failure/delays in the EuCARD-2 deliverables/milestones.
- Giving recommendation to the EuCARD-2 management about scientific/technical choices to be made throughout the project or actions to be taken with the partners and or within the Work Packages.
- On request of the EuCARD-2 management, participating to an EuCARD-2 internal review.
- Providing a short document after each SAC meeting, and reporting at the EuCARD-2 plenary or EuCARD-2 governing board meeting

Finally the scientific advisory committee is expected to participate to the strategy reflections about the continuation of EuCARD-2 within the European framework but also with non European partners.

Specific objective for the 2016 meeting:

Contribute to identifying **key achievements and results** of EuCARD-2 in preparation for the Final Report due in June 2017.



# Past milestones: the Mid-Term Review

- **A General Review took place on 28 May 2015** at CERN, organised by the EC Scientific Officer to assess the progress of the project after the first 2 years. Presentations by all WPs for the 2 reviewers, **Mariano Menna (EC) and Steve Peggs** (BNL, proposed by the project, member of the Scientific Advisory Committee).
- Review Report received on 9.6.2015.
- The positive evaluation resulted in a Continuation Letter received on 25.6.2015.





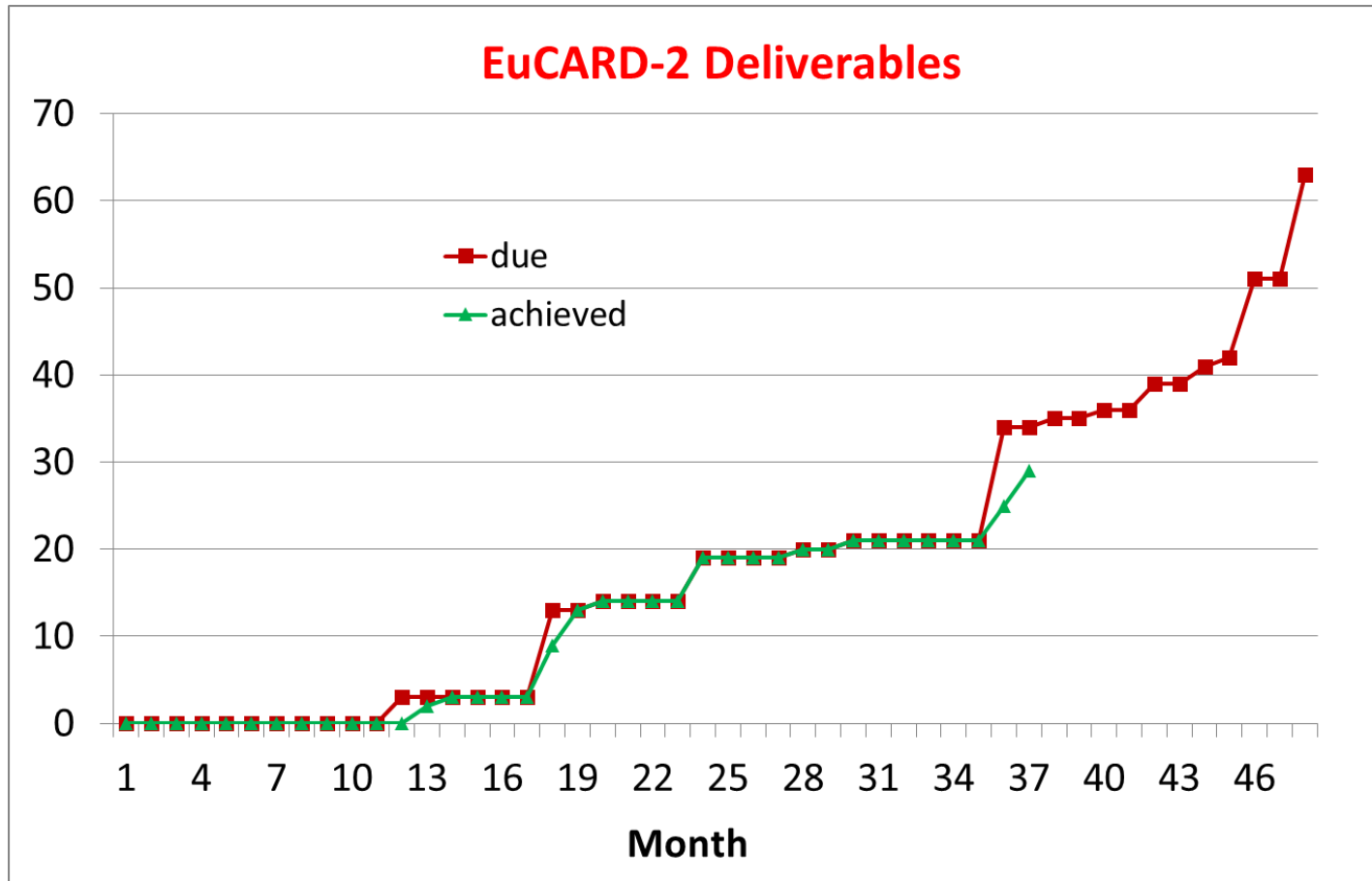
# Few excerpts from the Evaluation report

## GENERAL COMMENTS

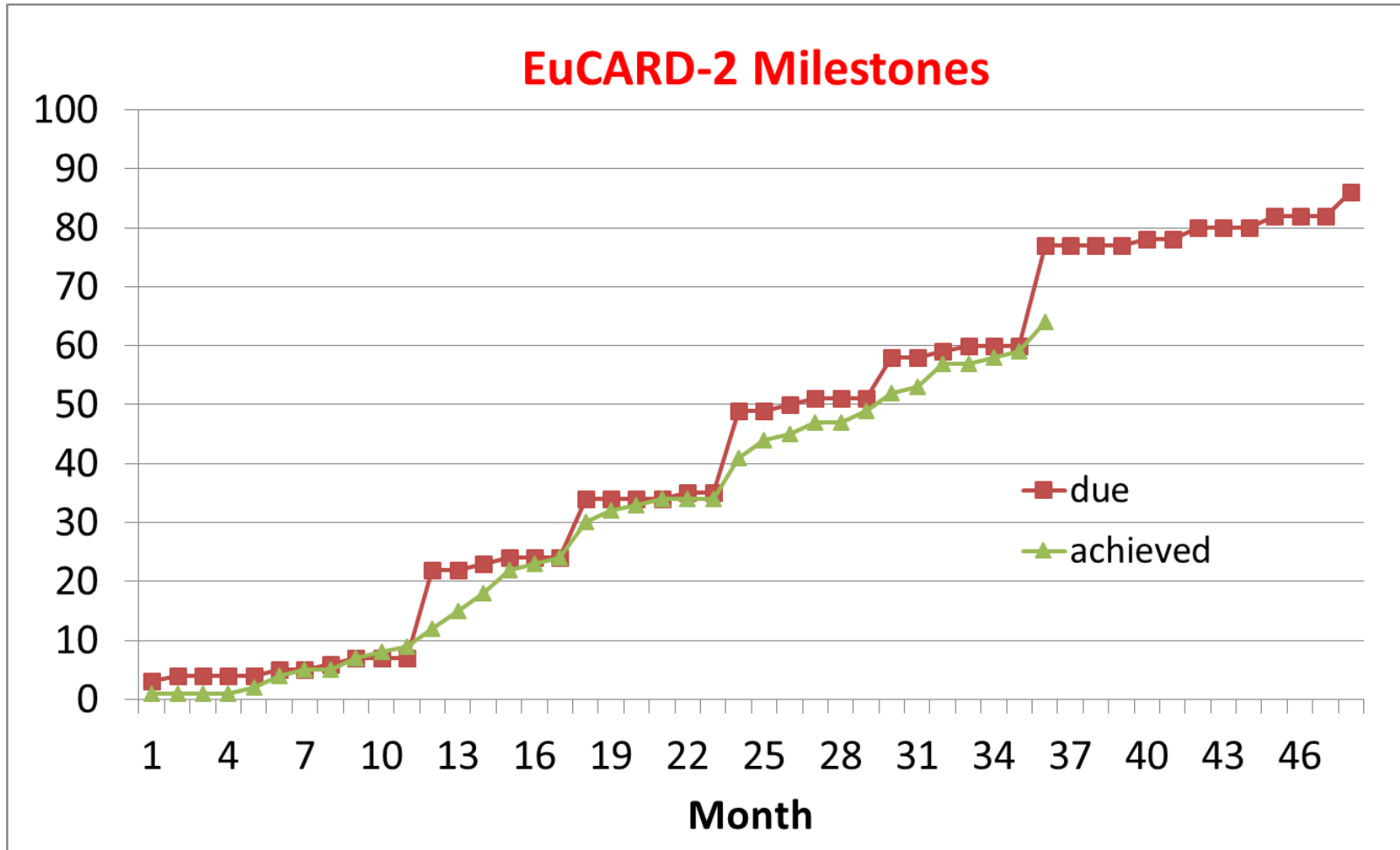
- The presentations made by EuCARD-2 collaborators at the mid-term review were of consistently high quality. The activities of the first two years are impressive, including the deliverable reports
- Excellent progress (the project has fully achieved its objectives and technical goals for the period or has even exceeded expectations).
- Project management is excellent.

## RECOMMENDATIONS

- **Ties to industry** have been strengthened and exploited in several Work Packages, but more progress is possible.
- anticipate the delivery of **final report statistics** by making them available on an annual basis. Networking Activities, in particular, need to provide quantitative indicators.
- **Young scientists** should continue to be encouraged to be active, especially in Networking Activities



Out of the 13 Deliverables due in April 2016: 4 practically achieved; 4 delay extended end May; 3 delayed (M38, M40, M42); 1 rejected; 1 no news



13 late Milestones – please react !

# Next challenges

We are facing the busiest period of the entire project:

- **13 deliverables** due at end of April, the largest number in a single month for the entire project – only 4 received and on the way to approval, 1 received but rejected.
- **17 milestones** end of April, again the largest number, large number of delayed MS.
- **2<sup>nd</sup> Periodic Report** due at end of June 2016 (M36).
- **3<sup>rd</sup> Annual Meeting** in April.

After June, again some quiet until November then the **final rush** till the end of the project.

Deadlines for **2<sup>nd</sup> Periodic report** (6 month summary prepared for MTR + update 2015/16)

- **1 May 2016**: input from Task Leaders to WP coordinators.
- **15 May 2016**: deadline for sending contributions to Coordinator.
- **31 May 2016**: complete draft submitted for comments to Steering Committee.
- **30 June 2016**: final version submitted to EC web portal.

**PLEASE COMPLETE  
CONTRIBUTION AS  
YOU GO HOME**





# Scientific Achievements

This slide is for you to fill!

In presenting your Workpackages, we have asked you to provide:

- A few breakthrough results of your WP, as requested last year by the Scientific Advisory Committee,
- A report on status and future outlook of your WP.
- Comments on the late deliverables and milestones.
- An answer to the comments and recommendations made by the SAC for each WP at the last Annual Meeting (April 2015).



# From EuCARD-2 to ARIES



**A**ccelerator  
**R**esearch and  
**I**nnovation for  
**E**uropean  
**S**cience and Society

- **New proposal** for the call H2020 INFRAIA-01-2016-2017 **submitted on 30 March 2016**
- Continuation of some EuCARD-2 activities, start of new ones.
- Requested EC funding **10 M€**, total budget 24.8 M€ (42% funding rate).
- **18 Workpackages** (MGT, 7 Network Activities, 5 Transnational Access Workpackages, 5 Joint Research Activities).
- **42** partners from **18** EU countries (+CERN and ESS); coordination by CERN.

# The 4 ARIES Pillars



excellence

Develop **key accelerator technologies** to make more performant, affordable, reliable and sustainable the present and future accelerators

Improve the European **accelerator infrastructure**



access

New scheme of Transnational Access opening **14 accelerator test facilities**

**Enlarged consortium** with 20 new partners in accelerator projects and 6 new countries in the East and South of Europe



innovation

Enhanced **industrial participation** (7 industries and 1 association)

3 new **co-innovation programmes** with industry

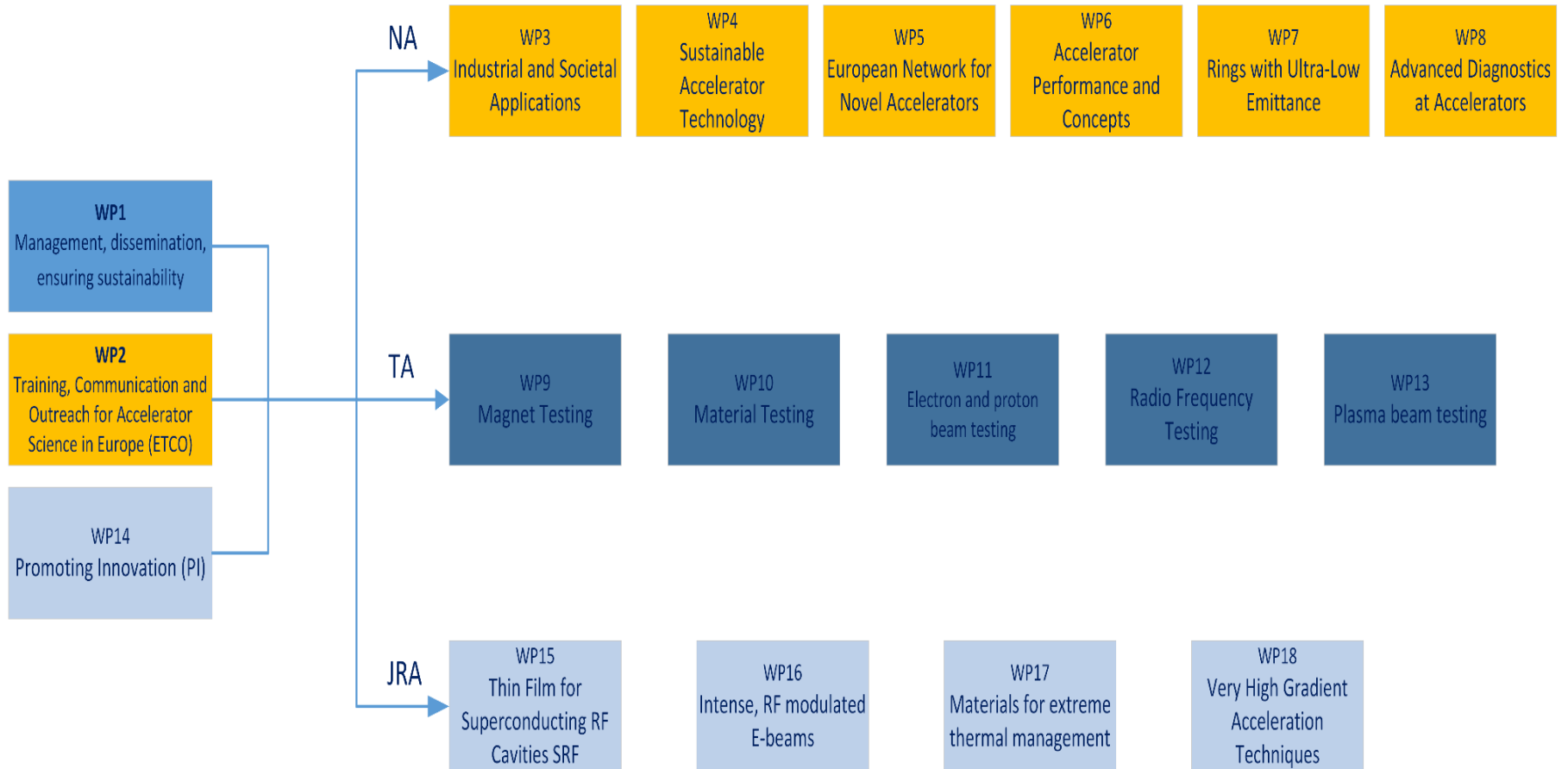
Development of **societal applications** (medicine, industry, environment)



sustainability

Joint programme with TIARA to develop a **model for sustainable accelerator science** in Europe

**Training programme** for the new generations of accelerator scientists and engineers





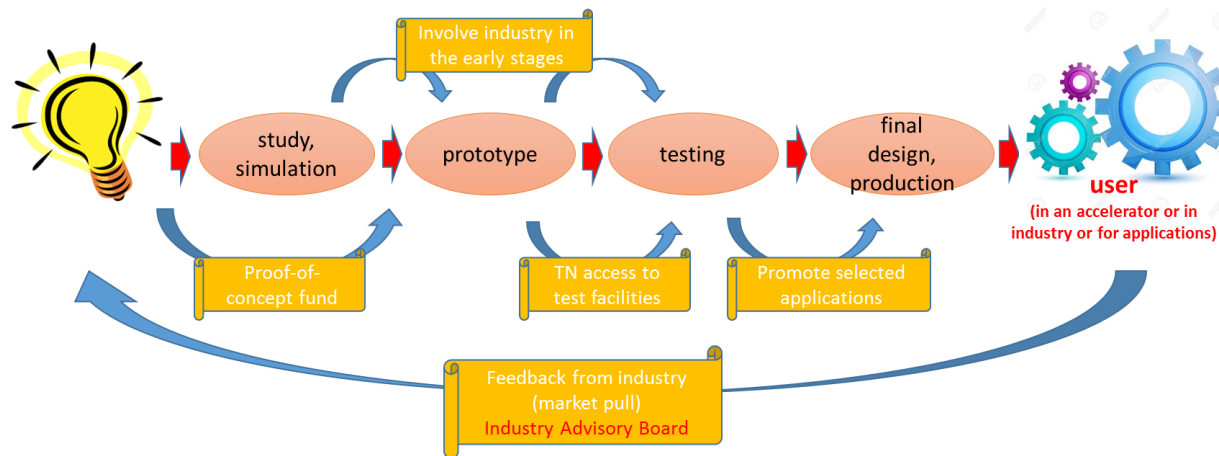


# ARIES Transnational Access

Access provider short name	Short name of infrastructure	Installation		Installation Country code	Type of access	Unit of access	Unit cost (UC) €	Min. quantity of access to be provided	Access costs		Estimated number of users	Estimated number of user projects
		Nr	Short name						On the basis of UC	As actual costs		
CERN*	MagNet	1	MagNet@CERN	IO	TA-uc	1h	0.00	1,920	1,548,825.60	-	40	8
UU	FREIA	1	Gersemi	SE	TA-ac	1h	-	2,880	-	183,212.80	56	8
CERN*	HiRadMat	2	HiRadMat@SPS	IO	TA-uc	1h	0.00	200	654,000.00	-	20	5
GSI	UNILAC	1	M-branch	DE	TA-uc	1h	274.79	480	131,900.00	-	48	8
KIT	KIT-ATP	1	KIT-ANKA	DE	TA-uc	1h	416.22	480	199,787.04	-	64	8
KIT	KIT-ATP	2	KIT-FLUTE	DE	TA-ac	1h	-	320	-	100,975.00	40	8
CEA	IPHI	1	IPHI	FR	TA-ac	1h	-	1,440	-	267,144.00	72	12
DESY*	SINBAD	1	SINBAD	DE	TA-ac	1h	-	630	-	257,500.00	36	9
STFC	VELA	1	VELA	UK	TA-ac	1h	-	336	-	198,737.87	56	14
UU	FREIA	2	HNOSS	SE	TA-ac	1h	-	2,880	-	199,585.15	44	4
CERN*	XBox	3	XBox@CERN	IO	TA-uc	1h	0.00	6,000	750,080.00	-	64	4
CNRS	LULI	1	APOLLON	FR	TA-ac	1h	-	180	-	695,456.25	48	6
CEA	LIDyL	2	LPA-UHI100	FR	TA-uc	1h	117.00	640	74,880.00	-	40	4
UL	LULAL	1	LULAL	SE	TA-uc	1h	170.00	480	81,600.00	-	36	6

**Total no. of users = 664**

- 14 facilities grouped in 5 Workpackages
- for magnets, materials, beams, RF and plasma acceleration testing
- 660 estimated users
- More than 18'000 access units (hours)
- 32% of total budget, 22% of EC funding



In ARIES  
Promoting  
Innovation is a  
Joint Research  
Activity!

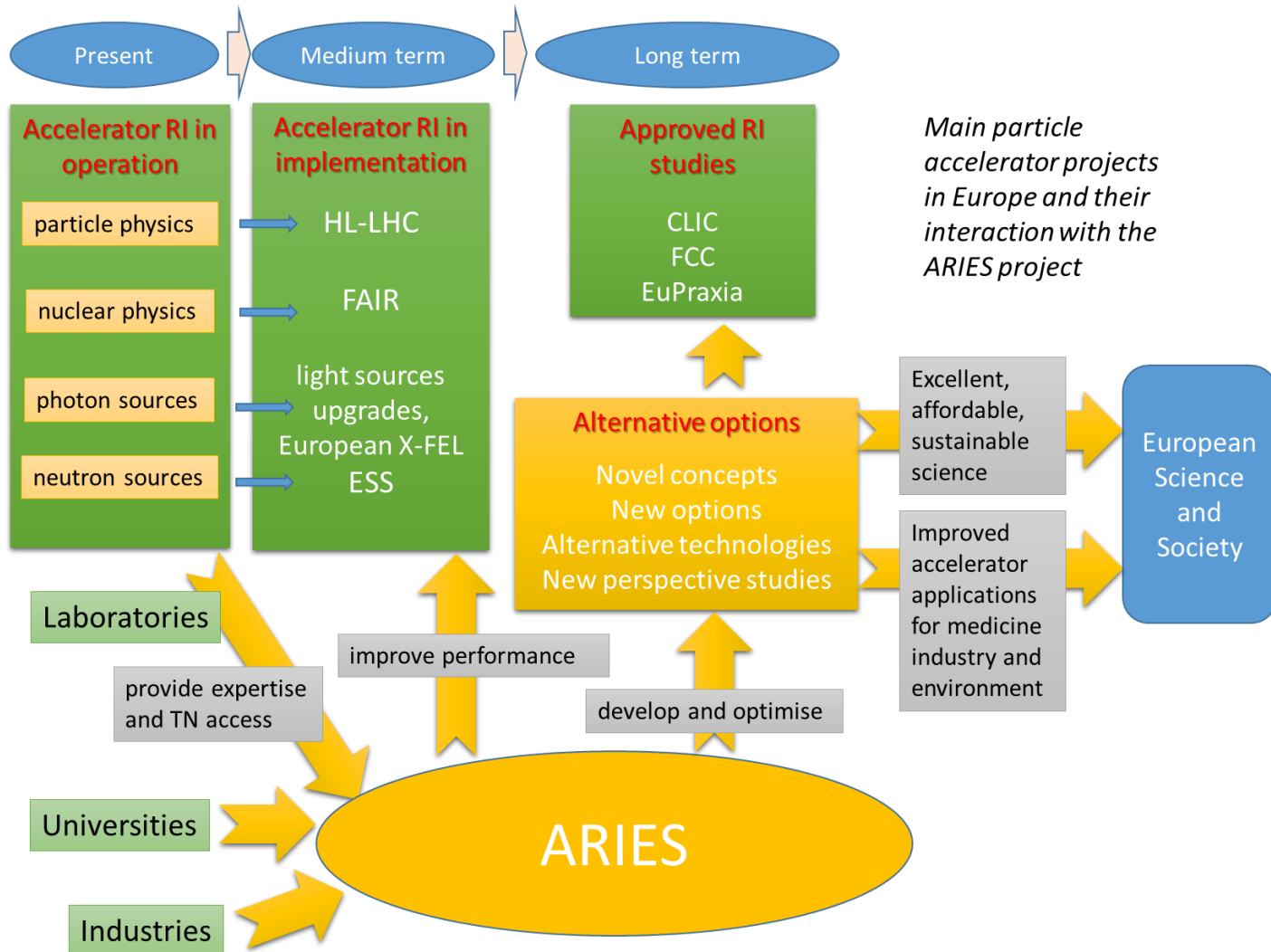
## Support to all stages of the innovation process:

- **Proof-of-concept innovation fund:** for Business Plan preparation, market assessment, demonstration of the technological viability for exploitation of selected projects
- **Industrial Advisory Board:** provide business consultation (eg. business plans) and support market assessments (“market pull”).
- **ARIES meets industry events**
- **Co-innovation programmes with industry:**
  - breakthrough in the cost per kAm of industrial High Temperature Superconductors
  - production of materials for extreme thermal management
  - production of a standardized timing for medical and industrial applications.

- Define in collaboration with TIARA a **strategy and roadmap** for future support of accelerator RI involving **new EC instruments, industries, national agencies, and individual laboratories**.
- Develop **human potential in accelerator science** and related technologies with a strong WP on training (pilot e-learning course) and outreach (and with the support given to about 30 PhD and Postdoc students throughout the project).



# The ARIES concept







EuCARD-2

ARIES

From EuCARD-2 to ARIES... even more fun!