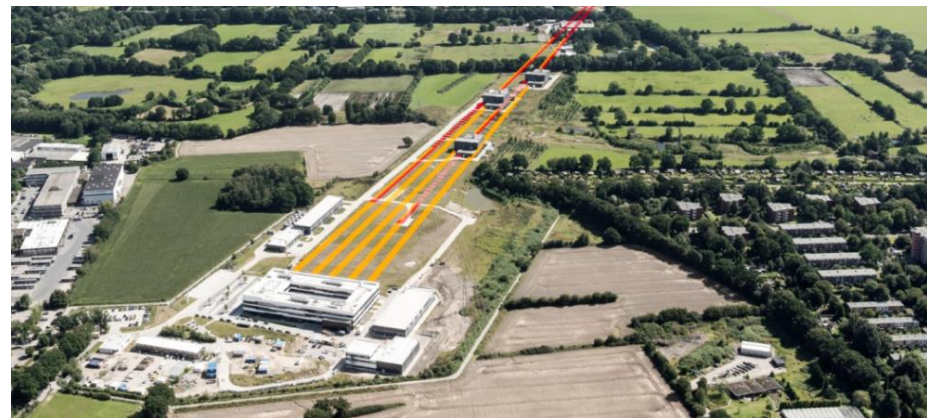
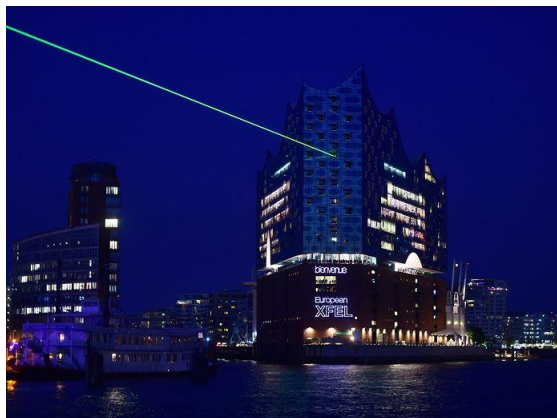




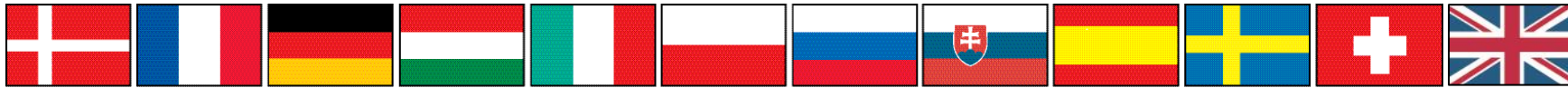
# European XFEL

Prof. Robert Feidenhans'l  
European XFEL Managing Director

Granada, October 2022



## European XFEL – a user facility of superlatives

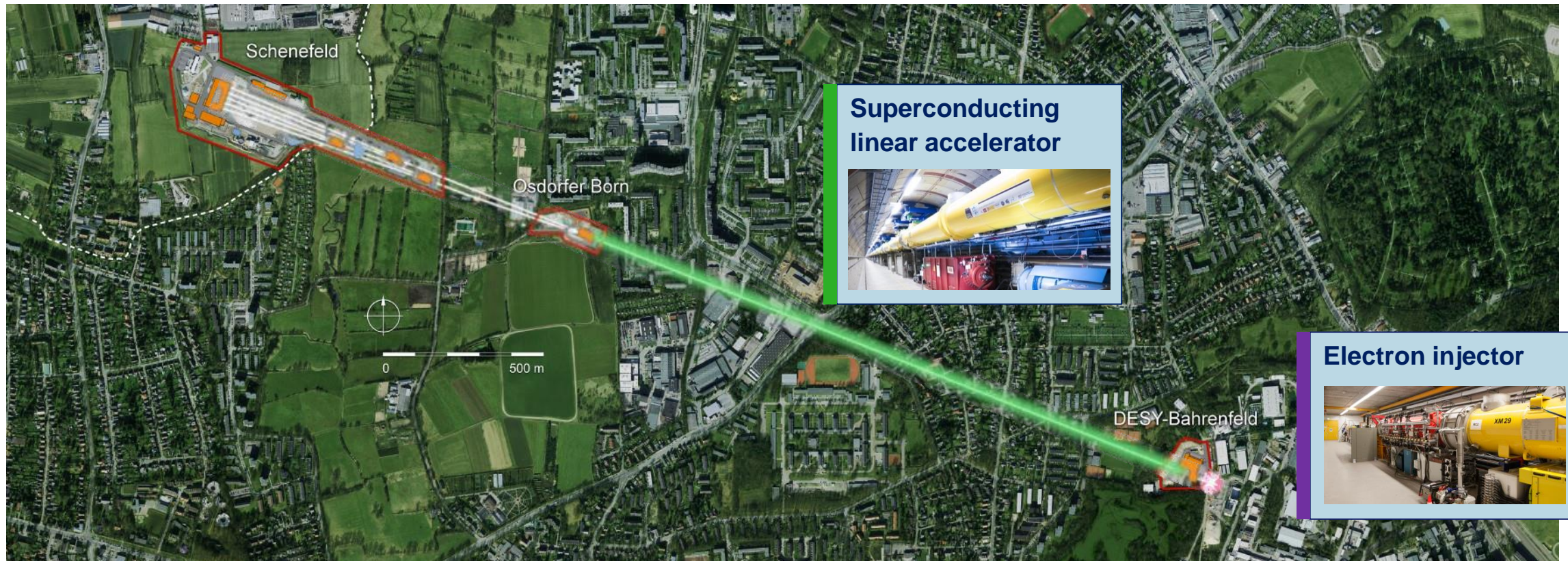
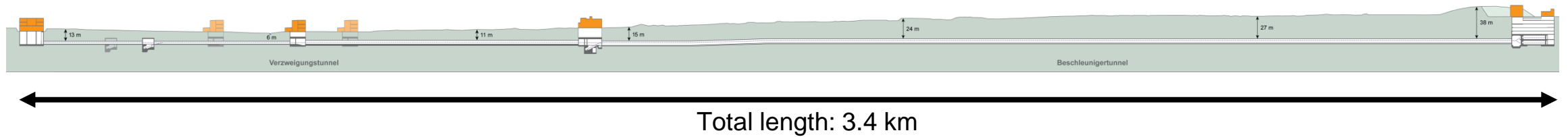


- \* Facts and Figures
  - \* Non-profit company with 12 partner countries
  - \* Start of construction in 2009
  - \* Start of operation in September 2017
    - ▶ 5-year anniversary this year!
  - \* Construction costs: 1.25 billion Euro
  - \* Annual budget: about 140 million Euro
  - \* More than 500 employees (plus 250 at DESY)
- \* The largest and strongest X-ray laser in the world!
- \* Part of ESFRI Roadmap since 2006, ESFRI Landmark since 2016



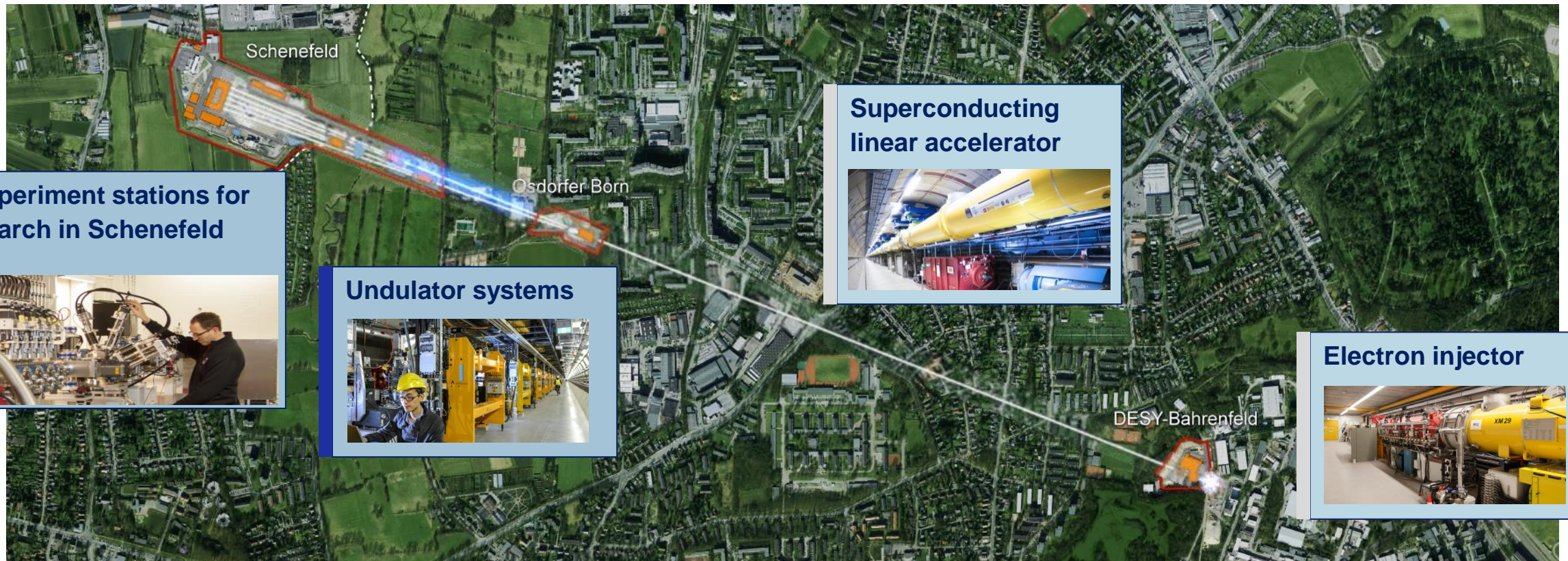
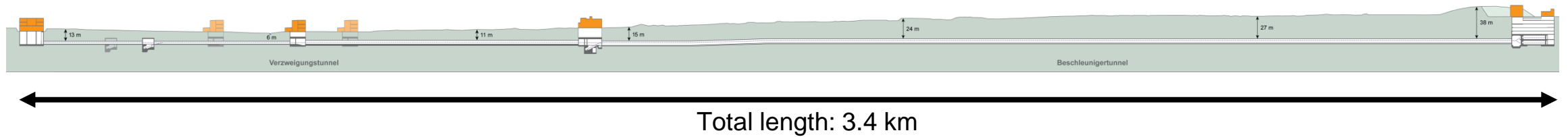


# How does an X-ray laser work? The European XFEL in a nutshell





# How does an X-ray laser work? The European XFEL in a nutshell





## A user facility

- \* European XFEL is a research facility open for **users from around the world**
  - \* One experiment takes about 3-5 days
  - \* **Topics defined by the user**
  - \* >8000 h of beamtime to users in 2022
  - \* Today ~ 100 experiments/year
- \* To gain access:
  - \* Research groups write proposals
  - \* Panels of experts review the proposals
  - \* **Selection based on excellence**
  - \* European XFEL scientists and engineers support the users
- \* >1500 individual users since start of operation from more than 30 countries

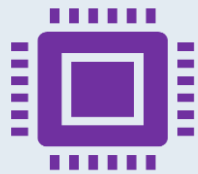


# European XFEL, in collaboration with the users, contributes to the solutions of the future



## Health

**Structure & dynamics of biomolecules** to understand fundamental processes important for human health



## Digitalization

**Driving data science** by managing and analyzing (AI/ML) voluminous experimental data in near-to real time



## Climate & Energy

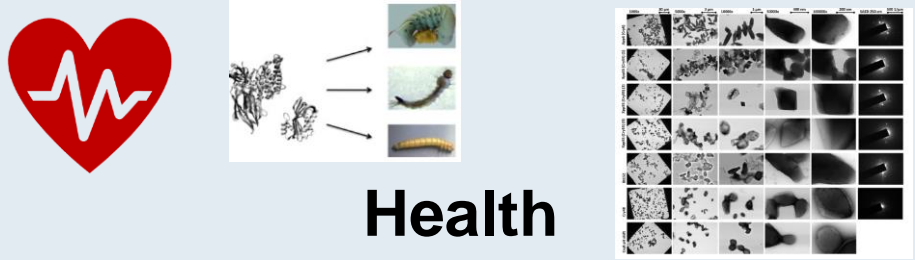
**Structure & dynamics of new materials** for more sustainable energy solutions and improved energy efficiency, storage & transport



## Environment & Sustainability

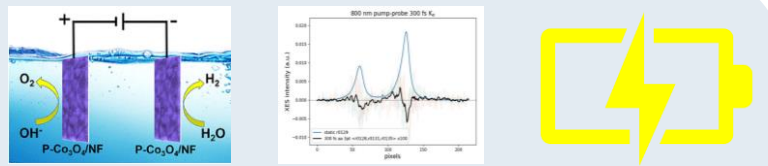
Study **novel materials** from sustainable sources, sustainable agriculture and geophysical processes of our planet

# European XFEL, in collaboration with the users, contributes to the solutions of the future




## Health

More efficient bacterial insecticides for agriculture and medicine



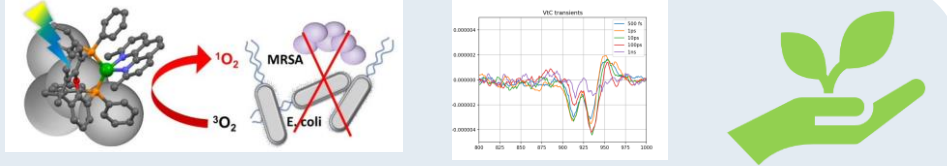
## Climate & Energy

New catalysts for electrochemical water splitting: clean, large scale production of H<sub>2</sub>

## Digitalization

Miniaturization of magnetic recording devices: 16 nm FePt  
Potential magnetic storage layer



## Environment & Sustainability

Copper complexes that act as an antibacterial agent in water under light

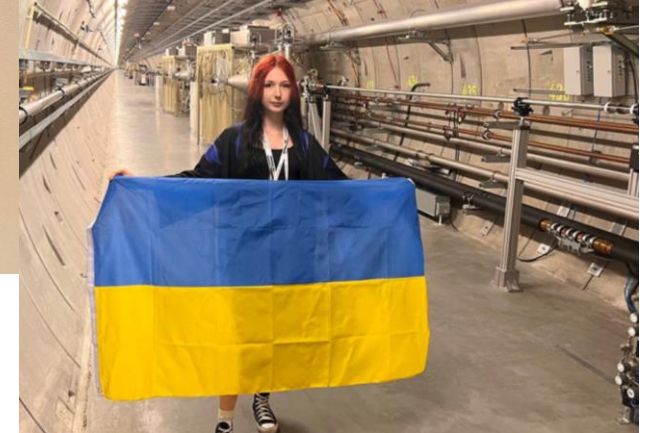


## Education and career development at European XFEL

- \* European XFEL Ph. D. programme
  - \* ~50 international Ph. D. students involved
  - \* Joint supervision with partners in Shareholder countries
  - \* Cooperations with other graduate schools
- \* Summer schools and lectures for international students
- \* Awards and internships for young students



EuXFEL Young Scientist Award 2022:  
Camilla Bacellar, PSI



EUCYS Award 2020/2021:  
Yana Holovatska



### „The Lighthouse – European XFEL Visitor and Conference Centre“

- \* Construction starting now, opening expected for 2024
  - \* 350 m<sup>2</sup> of permanent exhibition, virtual reality experience
  - \* Physics and biochemistry school labs
  - \* Conference centre for events and meetings

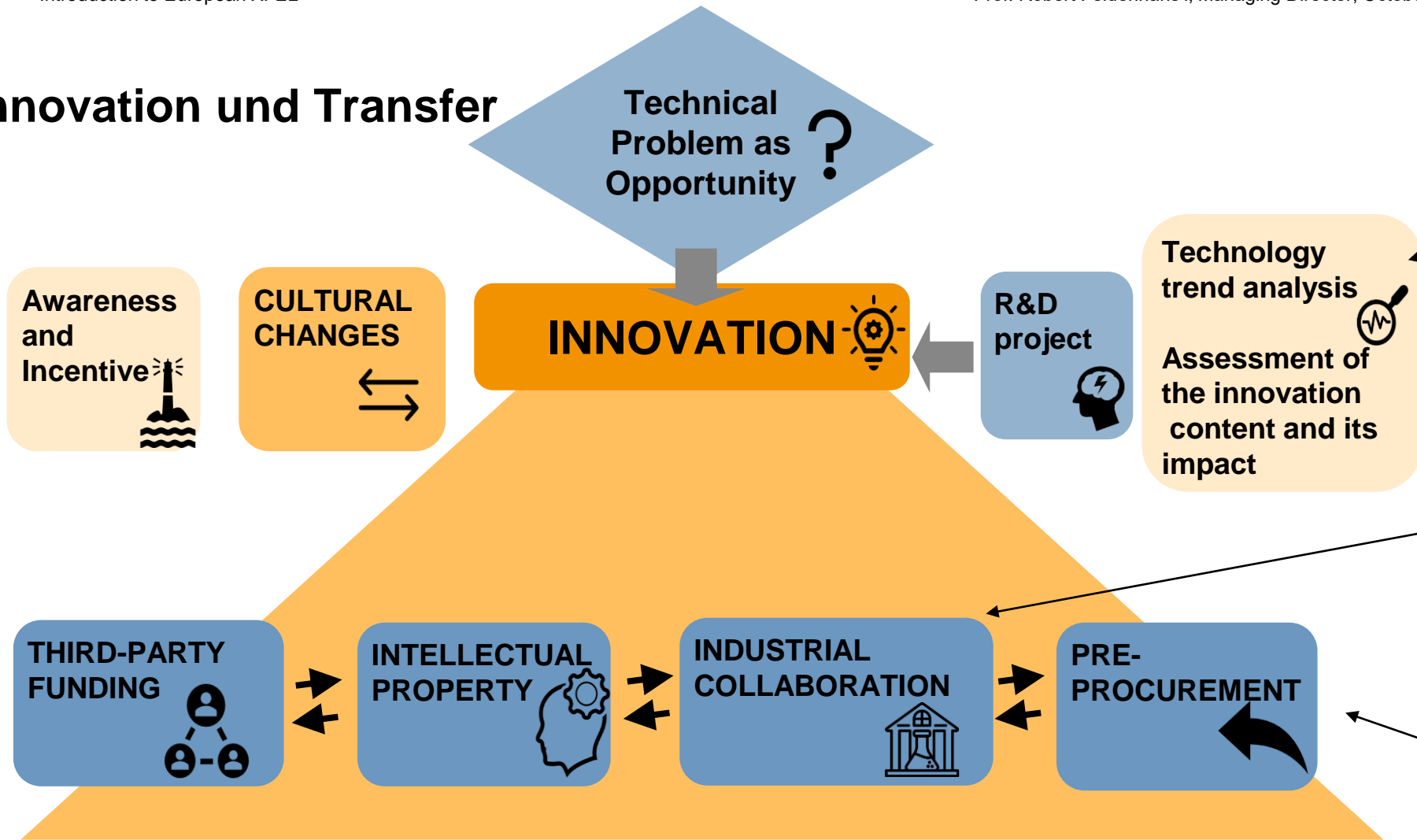


## Equal opportunities at European XFEL

- \* European XFEL is committed to promote equal opportunities
  - \* Charta of Diversity signed in 2022
  - \* Gender Equality and Diversity Plan launched 2022
  - \* Participation in DynaMENT mentoring programs for female PhD and Postdoc students
  - \* Annual Girls and Boy's Days



# Innovation und Transfer



- \* Procurements 2022 – 2026: estimated 418 Mio €
- \* Assessment of the developed technology has been done via technology trends analysis.
- \* In case of R&D, this plays a strong role in the project with the commercial industrial partner participating. New procurement approach (2014/24/eu) and industrial collaborations begun to be considered as innovation asset
- \* Involvement of the National ILO network in the search for technology providers

Visit us at booth S28 -  
European XFEL ILO- Antonio Bonucci



## 2022-2026 INVESTMENT PLANS AND OUTLOOK

	Project	Start Commissioning
- <u>Ongoing projects</u>	APPLE-X (Variable polarization at SASE3)	Summer 2023
	SA3-ODL (X-ray delay line for SASE3)	Summer 2024
	XFEL O (X-ray FEL oscillator)	Summer 2024

### \* Mid-term development at European XFEL (2022-2026)

- \* Develop and build a superconducting afterburner for SASE2
- \* Build a 3<sup>rd</sup> scientific instrument at SASE2
- \* Provide sub-femtosecond pulse duration capability (ASPECT)
- \* Initiate the design and construction of a 2<sup>nd</sup> generation of pixel detectors (DET, R&D)
- \* Prepare and build SASE4 and SASE5 FELs and the instruments at them

# Thank you for your attention!

