



FUEL CELLS AND HYDROGEN
JOINT UNDERTAKING

TeachHy
Teaching Fuel Cell and
Hydrogen Science and
Engineering Across Europe



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Programme Review Days 2019

Brussels, 19-20 November 2019

PROJECT OVERVIEW



- Call year: 2017
- Call topic: FCH-04-3-2017
- Project dates: 01 Nov 2017 – 31 Oct 2020
- % stage of implementation 01/11/2019: 75%
- Total project budget: 1 289 658 €
- FCH JU max. contribution: 1 248 528 €
- Other financial contribution: 1 000 000 €



- **Partners:** University of Birmingham, Technical University of Delft, Politecnico di Torino, National Technical University of Ukraine 'Kyiv Polytechnic Institute' – KPI, Denmark Technical University - DTU, University of Chemistry and Technology, Prague – UCPT, École Polytechnique Fédérale de Lausanne - EPFL, Université libre de Bruxelles - ULB, University POLITEHNICA of Bucharest, Grenoble institute of technology – INP, Ulster University, Karlsruhe Institute of Technology - KIT



PROJECT SUMMARY



TeachHy - Teaching Fuel Cell and Hydrogen Science and Engineering Across Europe

Objectives

- establishing a blended learning MSc course to be delivered by a network of European universities
- establishing a focal point of advanced education in FCH technologies
- offering CPD and public educational materials and certified professional courses
- developing means of offering virtual and distance access to laboratory facilities
- implement the MSc course material on the NET-Tools platform
- offering subscription of universities to the TeachHy concept

State of the Art

- no comparable online or blended learning offerings



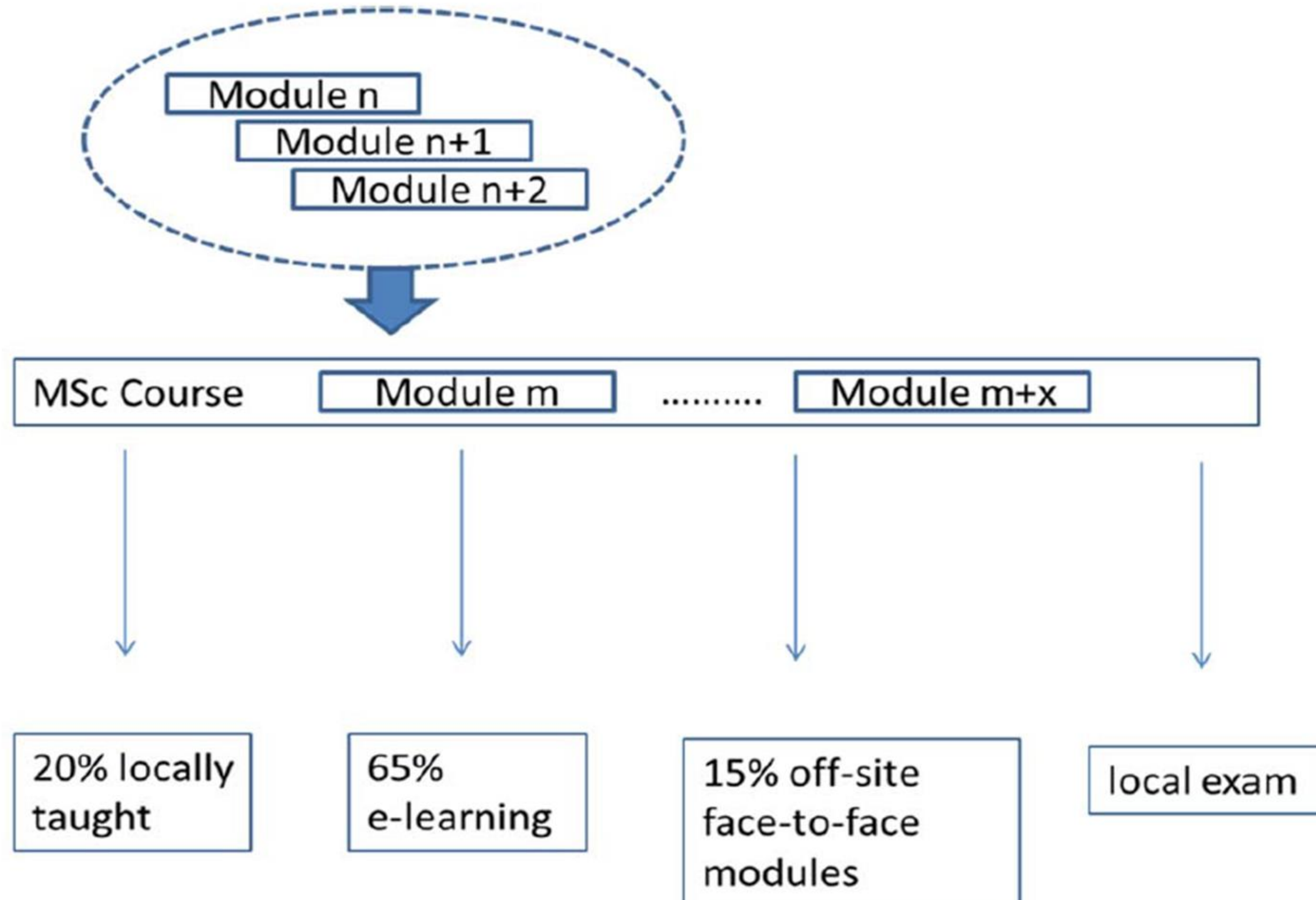
PROJECT CHALLENGE - University FCH training in Europe



- many universities cover single topics in FCH in courses such as Physics and Chemistry (thermodynamics, electrochemistry), Materials Sciences, Chemical & Mechanical engineering etc.
- within the EU only one (!) university offers an FCH MSc degree
- many universities are willing to participate but can only cover about ~30% of the necessary lecturing material and capacity
- a number of 50 to 200 university courses are needed to cover the HR demands by 2030
- how can the missing ~70% be supplied?
- how can quality of teaching be assured in a high number of newly developed courses?



PROJECT CONCEPT – Implementing MSc training



PROJECT CONCEPT 2 - The MSc Course Offer



- any participating university can 'buy' into the network
- currently on a 'tit for tat' basis – you take, you give (e.g. by translating material)
- later as a sustainable business model
- from the modules available an individual MSc course can be built, deciding what to deliver locally (face-to-face) and what online
- organise lab work locally (or in collaboration with other uni) and exam
- locally/nationally accredit the course
- participate in student / staff exchanges

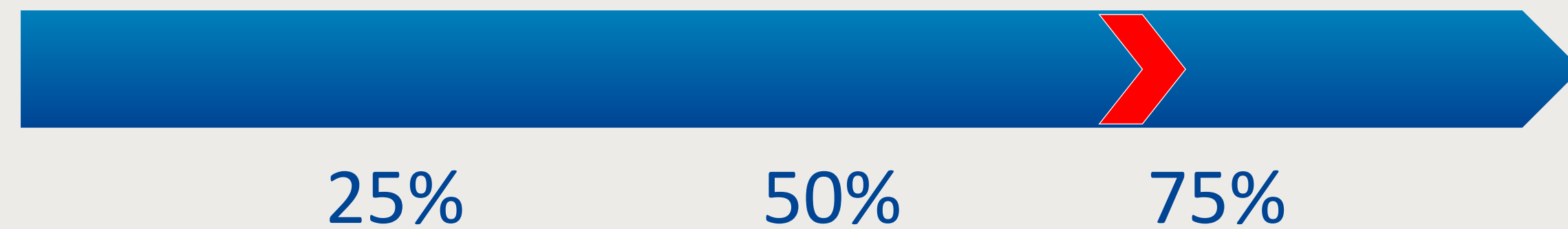


PROJECT PROGRESS – Developing Educational Content



Achievement to-date

start from
scratch



19 modules
x 15 lectures =
285 learning
units

Accomplished

- collection of pre-existing lectures and educational material
- structuring of content into 7 compulsory and 5 optional modules (out of 12)
- establishment of additional material to fit 12 / 18 / 24 month MSc programmes across Europe

Ongoing

- testing of modules
- preparation of test run

Outstanding

- first test run in 2020 and first full course from Oct 2020

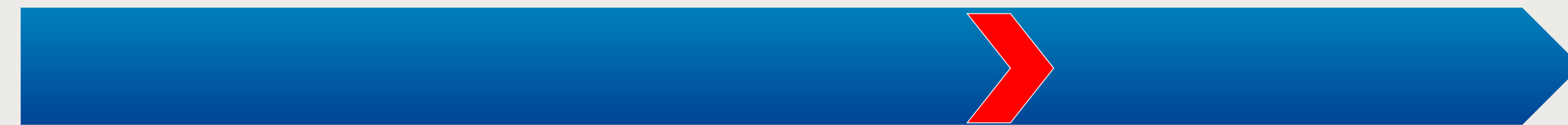


PROJECT PROGRESS – Implementing the Course



Achievement to-date

start from
scratch



25%

50%

75%

structured
course
implemented
on LMS

Accomplished

- modules recorded and implemented on CANVAS
- complete set of modules documented, programme prepared for accreditation

Ongoing

- testing on different LMS platforms (CANVAS, NET-Tools)
- accreditation at UoB
- hybrid course delivery at TU Delft and Grenoble INP

Outstanding

- translation of material
- accreditation at multiple universities



PROJECT PROGRESS – Implementing the Course (2)



The screenshot displays a multi-tabbed web browser with three open tabs, all pointing to Canvas LMS pages for the course 'C2 - 2 Basic Introduction to Electrochemistry' (ID 32407).

- Top Tab:** The main course page. The left sidebar shows navigation links: Home, Announcements, Assignments, Discussions, People, Pages, Files, Syllabus, Outcomes, Quizzes, Modules, Conferences, Collaborations, Attendance, Chat, SCORM, Panopto, and Settings. The main content area has a 'Learning outcomes' section with two bullet points:
 - A recap of the previous module on Electrochemistry & Thermodynamics
 - Applied to fuel cells and electrolysis
- Middle Tab:** The 'Lecture 2: A Basic Introduction to Electrochemistry' page. It includes instructions: 'Please make sure you use the full screen feature to begin by watching the video lesson for this unit. The lecture slides can be downloaded below.' Below this is a video player showing a slide titled 'A basic introduction to Electrochemistry' from the University of Birmingham, presented by Dr. Shangfeng Du, Centre for Fuel Cell and Hydrogen Research, School of Chemical Engineering. The slide also mentions 'Courtesy to Jens Oluf Jensen'.
- Bottom Tab:** A page titled 'Summary' with a section for 'Resources' containing a link to 'Presentation: A Basic Introduction to Electrochemistry and Thermodynamics'.

The bottom of the image shows a Windows taskbar with various application icons and a system clock indicating 08:06 on 06/11/2019.

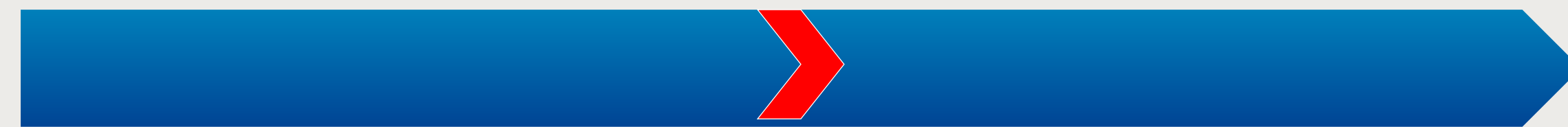


PROJECT PROGRESS – Continuous Professional Development



Achievement to-date

start from
scratch



25%

50%

75%

XXX

Accomplished

- identification of compatible modules / lectures

Ongoing

- events at TU Delft and KPI
- preparing topical MOOCs

Outstanding

- full implementation of pilot courses
- accreditation with CPD bodies across consortium countries



SYNERGIES WITH OTHER PROJECTS AND PROGRAMMES



Interactions with projects funded under EU programmes

- TrainHy – MSc course based on syllabus developed by TrainHy
- HySafe – Hw safety module from HySafe
- KnowHy – blended learning and CPD approach



Interactions with national and international-level projects and initiatives

- IPHE – Educational Activities – represented by Jürgen Garche on Advisory Board
- EPSRC Supergen H2FC Hub – use of Educational Portal
- T.I.M.E. network – network partners



Interactions with private projects and initiatives

- JESS – Joint European Summer School – cooperation on module development and delivery



Risks and Challenges



Accreditation procedures

- diversity of accreditation models at universities
- reluctance of university administrations to accept external contributions
- 'ownership' of modules

Financial issues

- divergence of university financing models and tuition charges
- reluctance of funding of educational activities –
under-funding, considerable unpaid and unrecognised university input



Communications Activities



- Facebook group



- LinkedIn entry



- Twitter feed



dedicated web site

- www.TeachHy.eu
- with blog and regular newsletter

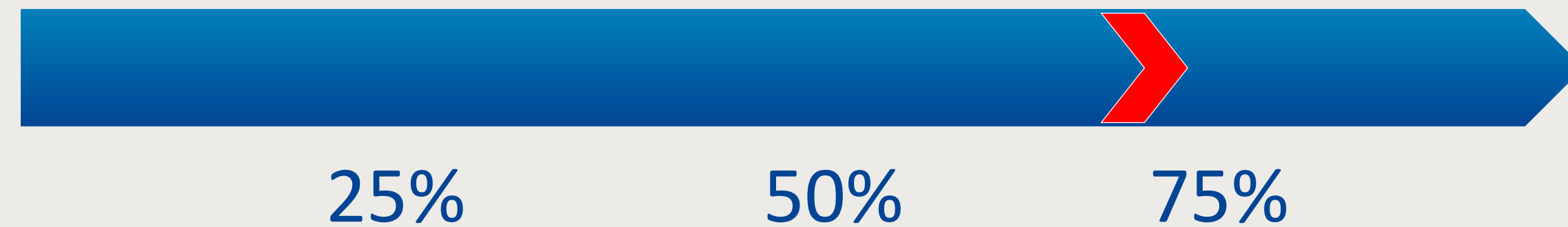


PROJECT PROGRESS – Business model post-project



Achievement to-date

start from
scratch



agreements
with network
universities in
place

Accomplished

- first draft of business model post-project established
- license model to access to training material

Ongoing

- negotiations with partner network on licensing conditions
- collection of EoI's and MoU's

Outstanding

- agreements in place across partner network



EXPLOITATION PLAN/EXPECTED IMPACT



Exploitation

- roll-out of the MSc course implementation across the partner network
- establishment of a post-project business entity to maintain and update educational material database
- implementation of CPD schemes

Impact

- access to MSc- and professional level FCH educational material across EU
- option for a multitude of universities to offer FCH-related courses and specialisation
- adaptation of university-course material to technician training and CPD
- broader public, stakeholders and politician education





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