# TIARA WP5 Status

**Philip Burrows**

***John Adams Institute for Accelerator Science***

***Oxford University***

# Outline

- Reminder of tasks
- Participants / contacts
- Status of milestones + deliverables
- Education and training survey database
- Survey of ‘market needs’ for accelerator scientists

# WP5: outline

**WP5.1 Make a survey of the number of students, courses and teaching resources in Accelerator Science and establish a common resources database**

**WP5.2 Evaluate and develop the "market" for trained Accelerator Scientists (physicists, engineers, technicians) for research, healthcare, industry and public service**

**WP5.3 Determine a plan of action for promoting Accelerator Science and Technology within schools, universities, research organisations, industry and society**

# WP5 participants / contacts

| | | |
|---|---|---|
| 1 | CEA: | Phu-anh Phi Nghiem, Francois Kircher |
| 2 | CERN: | Roger Bailey (CAS), Kate Kahle (EUCARD)<br>Louis Rinolfi (JUAS) |
| 3 | CNRS: | Alex Muller, Catherine Clerc |
| 4 | CIEMAT: | Marisa Marco, Diego Obrador, Susana Falcon |
| 6 | GSI: | Oliver Boine-Frankenheim, Sabrina Appel |
| 7 | INFN: | Vittorio Vaccaro, Francesca Galluccio |
| 8 | PSI: | Lenny Rivkin |
| 9 | STFC: | Philip Burrows, Max Bradbury |
| 10 | Nordic group: | Soren Pape Moeller + Ole Petter Nordahl |
| 11 | IFJ: | Piotr Malecki |

# WP5: meetings

| | | |
|---|---|---|
| **6/1/11:** | **Pre-kickoff (phone)** | **5** |
| **23-24/2/11:** | **Kickoff (CERN)** | **13** |
| **24/5/11:** | **Survey discussion (phone)** | **10** |
| **25/7/11:** | **Survey drafting (CERN)** | **10** |
| **1/9/11:** | **Launch survey (phone)** | **10** |
| **6/10/11:** | **Survey status check (phone)** | **11** |
| **2/11/11:** | **Survey results (CERN)** | **13** |
| **27/1/12:** | **Report drafting (CERN)** | **10** |
| **30/3/12:** | **Report finalising + database (CERN)** | **9** |
| **31/5/12:** | **Preparing 'market survey' (phone)** | **9** |
| **13/6/12:** | **Plan ASR survey + report (Madrid)** | **12** |

# WP5: deliverables

| | month |
|---|---|
| D5.1 Education and training survey report (ETR) | 10 |
| D5.2 Education and training resources database (ETD) | 14 |
| D5.3 Needs for accelerator scientists report (ASR) | 22 |
| D5.4 Recommendations for promoting Accelerator Science and Technology in Europe report (PAR) | 33 |

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# WP5: milestones

| | |
|---|---|
| **MS19: meeting to plan ETR report** | **7** |
| ***D5.1 Education and training survey report (ETR)*** | ***10*** |
| **MS20: meeting to plan ETD database** | **11** |
| ***D5.2 Education and training resources database (ETD)*** | ***14*** |
| **MS21: meeting to plan ASR report** | **19** |
| **MS22: Interim report for input to WP2.2.4** | **20** |
| ***D5.3 Needs for accelerator scientists report (ASR)*** | ***22*** |
| **MS23: Meeting with WPs 3 and 4** | **26** |
| **MS24: Meeting to plan report** | **30** |
| ***D5.4 Recommendations for promoting Accelerator Science + Technology report (PAR)*** | ***33*** |

# WP5: milestones

| | | |
|---|---|---|
| **MS19: meeting to plan ETR report** | **25/7/11** | **7** |
| ***D5.1 Education and training survey report (ETR)*** | | ***10*** |
| **MS20: meeting to plan ETD database** | **2/11/11** | **11** |
| ***D5.2 Education and training resources database (ETD)*** | | ***14*** |
| **MS21: meeting to plan ASR report** | **13/6/12** | **19** |
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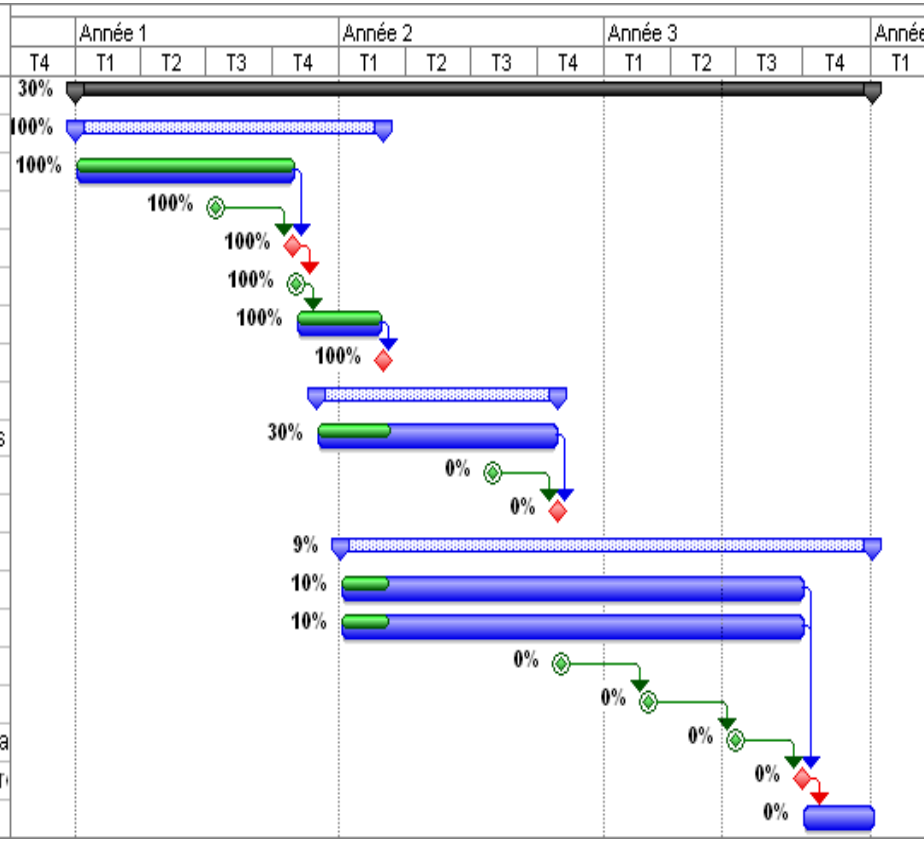
| ***D5.4 Recommendations for promoting Accelerator Science + Technology in Europe report (PAR)*** | | ***33*** |

# WP5: Gantt chart

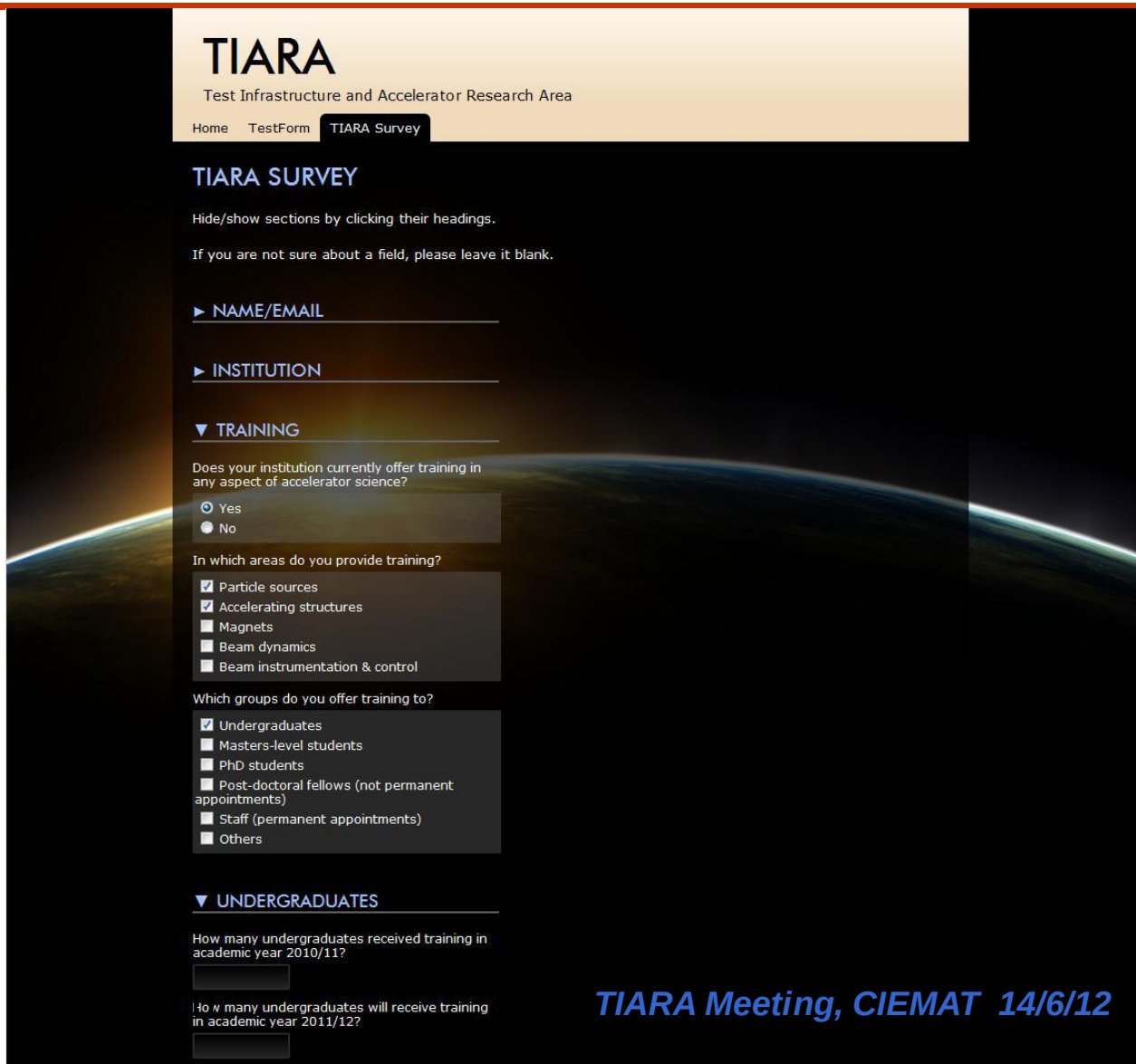
| N° | WBS | Task Name |
|---|---|---|
| 1 | 5 | **WP5: Education and Training for Accelerator Sciences** |
| 2 | 5.1 | **5.1 SAS: Survey of Accelerator Science** |
| 3 | 5.1.1 | 5.1.1 SASS: Survey of Students, Courses and Teaching Resources |
| 4 | M5.1 | M5.1 METR: Meeting to Plan Education and Training Survey Report (ETR) |
| 5 | D5.1 | **D5.1 ETR: Education and Training Survey Report** |
| 6 | M5.2 | M5.2 METD: Meeting to Plan Education and Training resources Database |
| 7 | 5.1.2 | 5.1.2 SASD: Development of Education and Training Resources Database |
| 8 | D1.2 | **D5.2 ETD: Education and Training Resources Database** |
| 9 | 5.2 | **5.2 MAS: Market for Accelerator Science** |
| 10 | 5.2.1 | 5.2.1: Evaluation and study of the Development of the Market for Accelerator Sciences |
| 11 | M5.3 | M5.3 MASR: Meeting to plan for Accelerator Scientist Report |
| 12 | D5.3 | **D5.3 ASR: Accelerator Scientist Report** |
| 13 | 5.3 | **5.3 PAS: Plan for Promoting Accelerator Sciences** |
| 14 | 5.3.1 | 5.3.1 DAS: Development of the Academic Sector |
| 15 | 5.3.2 | 5.3.2 TEK: Training and Exchange of Knowledge |
| 16 | M5.4 | M5.4 MIRW: interim report for input to WP2.2.4 |
| 17 | M5.5 | M5.5 MMWP: Meeting with WP4 and WP6 |
| 18 | M5.6 | M5.6 MPAR: Meeting to plan the Report on Recommendations for Promoting Accelera |
| 19 | D5.4 | **D5.4 PAR: Report on Recommendations for Promoting AcceleratorSciences in Eur** |
| 20 | 5.3.3 | 5.3.3 CFTR: Contribution to the Final TIARA-PP Report |



# www-based survey

## www-based questionnaire

http://tiara.physics.ox.ac.uk/tiara-survey/



# Survey report

Test Infrastructure and Accelerator Research Area

**TIARA WP5**
**Deliverable 5.1 - ETR**
**Education and Training Survey Report**

2 May 2012

*François Kircher, Phu-Anh-Phi Nghiem,* ***CEA, France***

*Roger Bailey, Louis Rinolfi,* ***CERN, Switzerland***

*M. Luisa Marco Arboli (****WP Deputy****), Susana Falcon, Diego Obradors,* ***CIEMAT, Spain***

*Catherine Clerc, Alex C. Mueller (****WP Deputy****),* ***CNRS/IN2P3/LLR, France***

*Leonid Rivkin,* ***EPFL, Switzerland***

*Sabrina Appel, Oliver Boine-Frankenheim,* ***GSI, Germany***

*Francesca Galluccio, Vittorio Vaccaro,* ***INFN-Napoli, Italy***

*Piotr Malecki,* ***Institute of Nuclear Physics, Polish Academy of Sciences, Poland***

*Søren Pape Møller,* ***ISA, Aarhus University, Denmark***

*Philip Burrows (****WP leader****), Max Bradbury,* ***John Adams Institute, University of Oxford, United Kingdom***

*Pauli Heikkinen,* ***University of Jyväskylä, Finland***

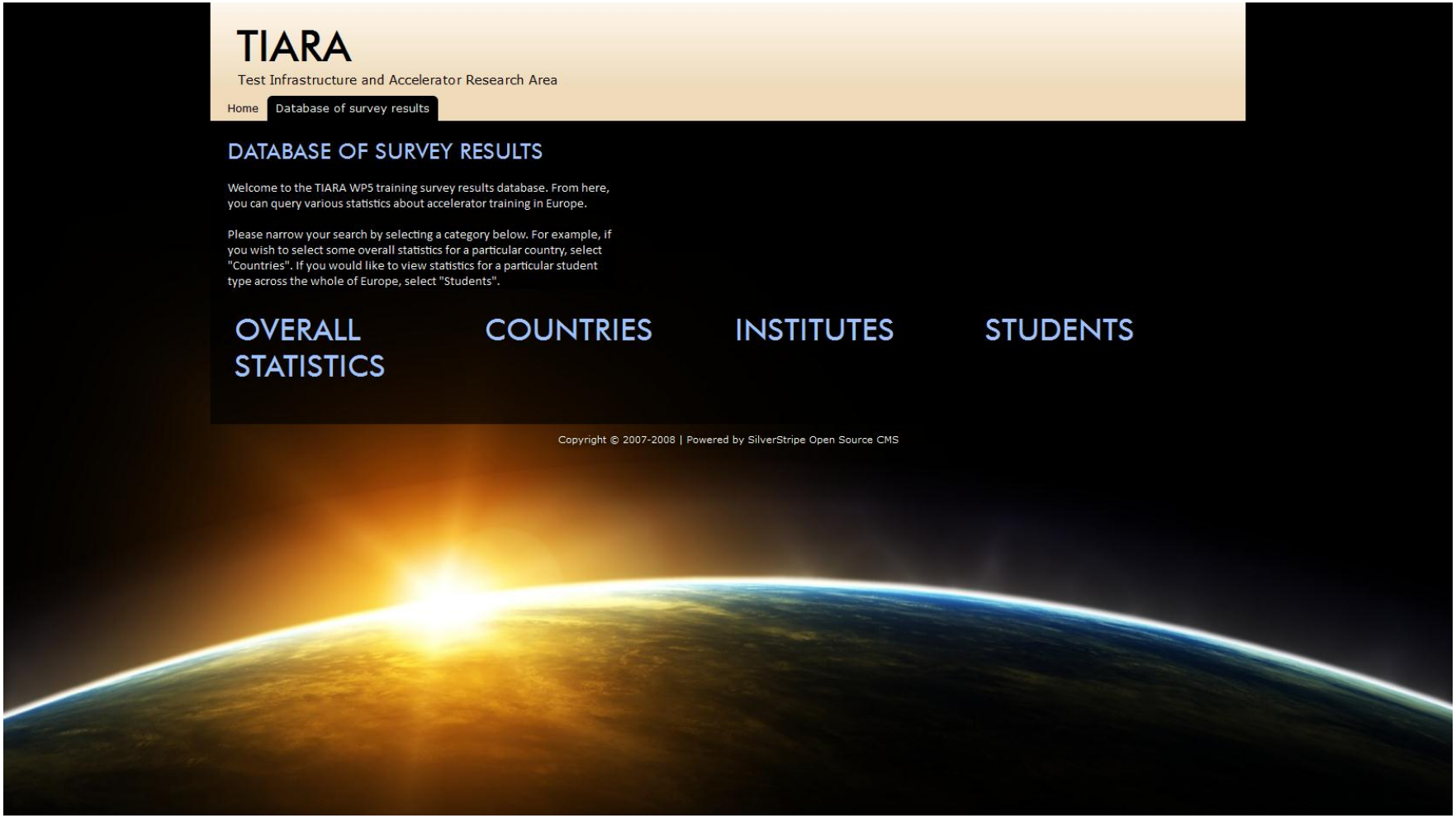
*Ole Petter Nordahl, Steinar Stapnes,* ***University of Oslo, Norway***

The research leading to these results has received funding from the European Commission under the FP7-INFRASTRUCTURES-2010-1/INFRA-2010-2.2.11 project TIARA (CNI-PP).

Grant agreement no 261905.

**Once GB has approved, can be released**

# www-based database front end




**allow charts, tables, histograms generated by user**

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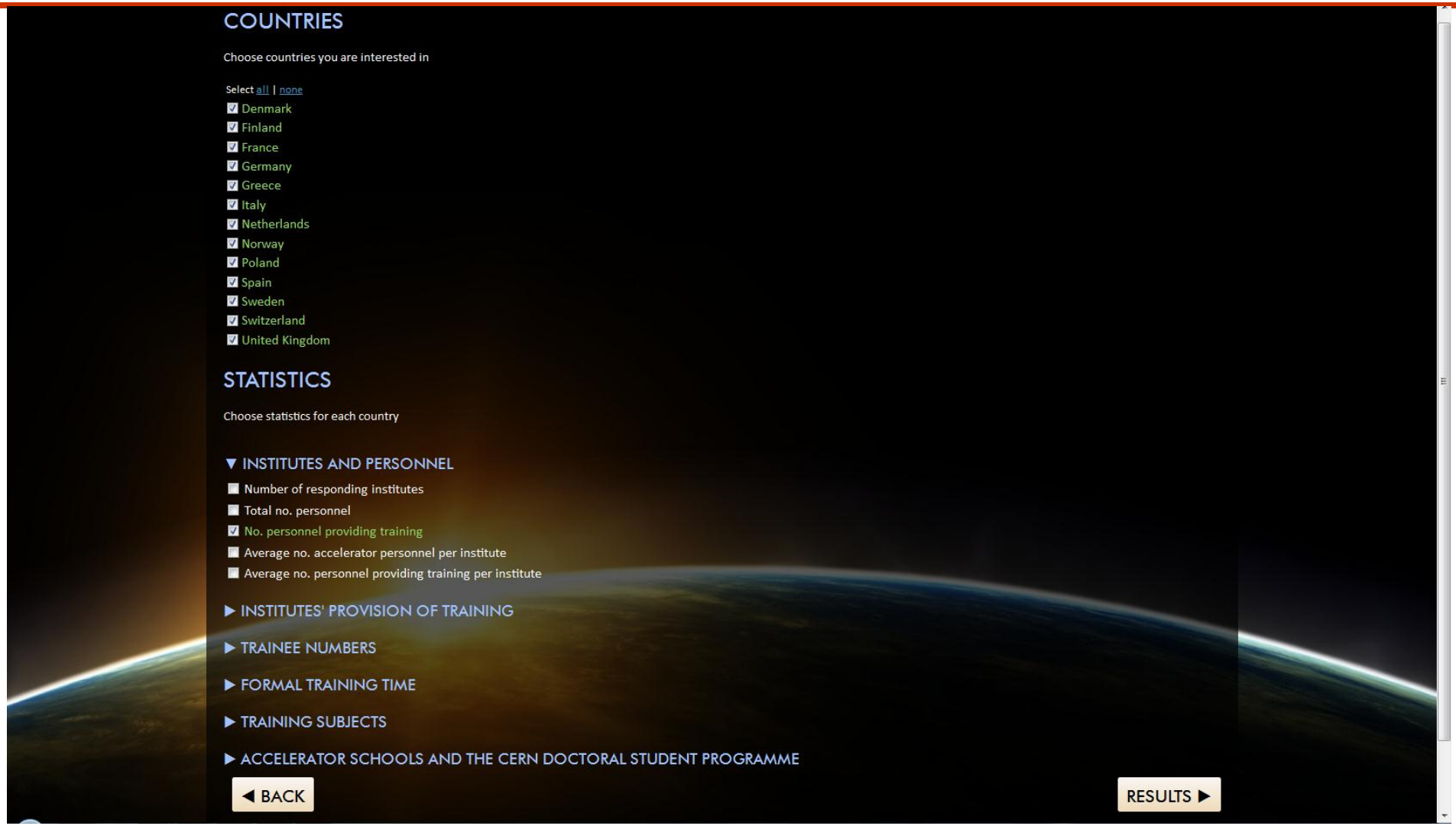
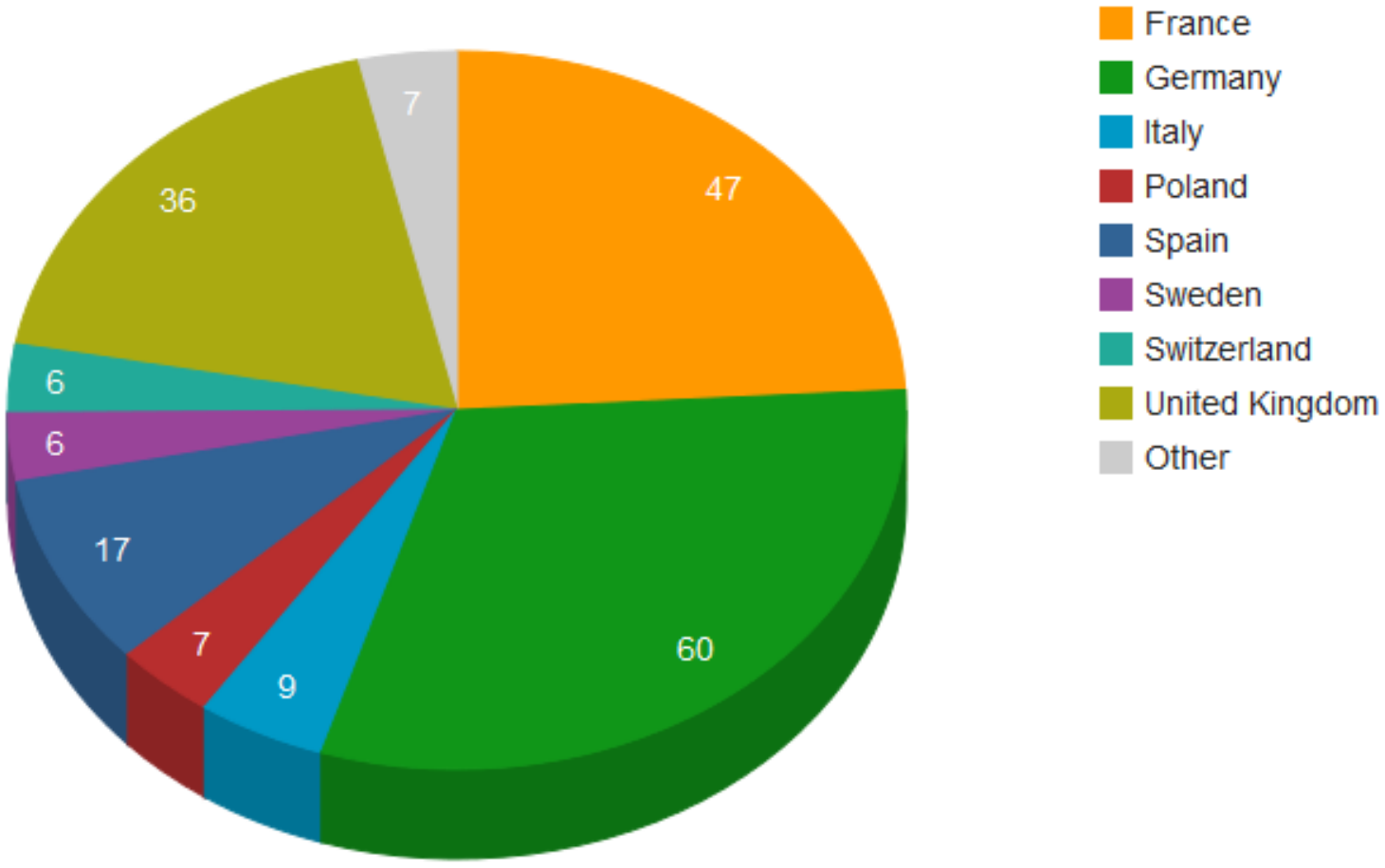


# Example: # training personnel



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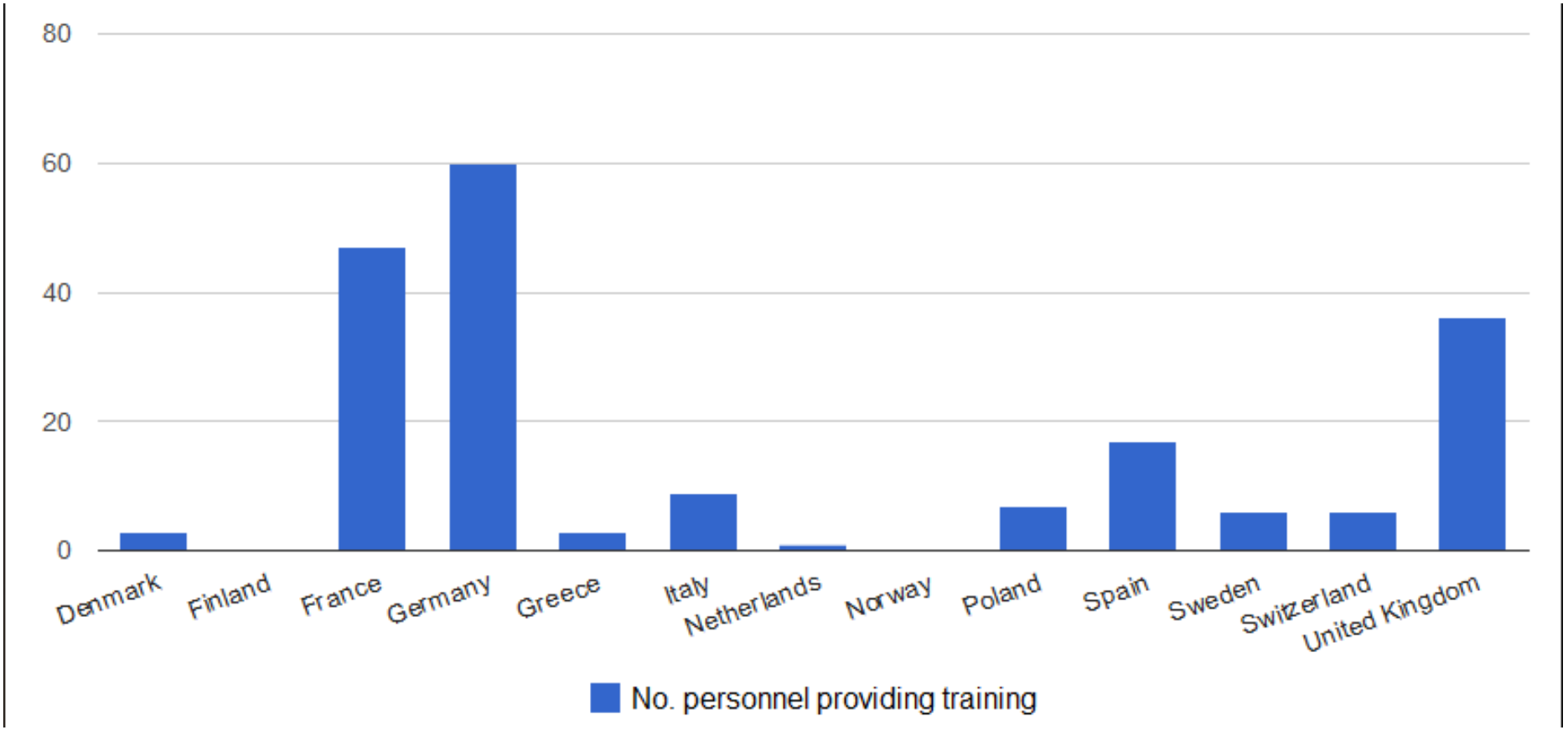

# Example: # training personnel

| Country | No. personnel providing training |
|---|---|
| Denmark | 3 |
| Finland | 0 |
| France | 47 |
| Germany | 60 |
| Greece | 3 |
| Italy | 9 |
| Netherlands | 1 |
| Norway | 0 |
| Poland | 7 |
| Spain | 17 |
| Sweden | 6 |
| Switzerland | 6 |
| United Kingdom | 36 |

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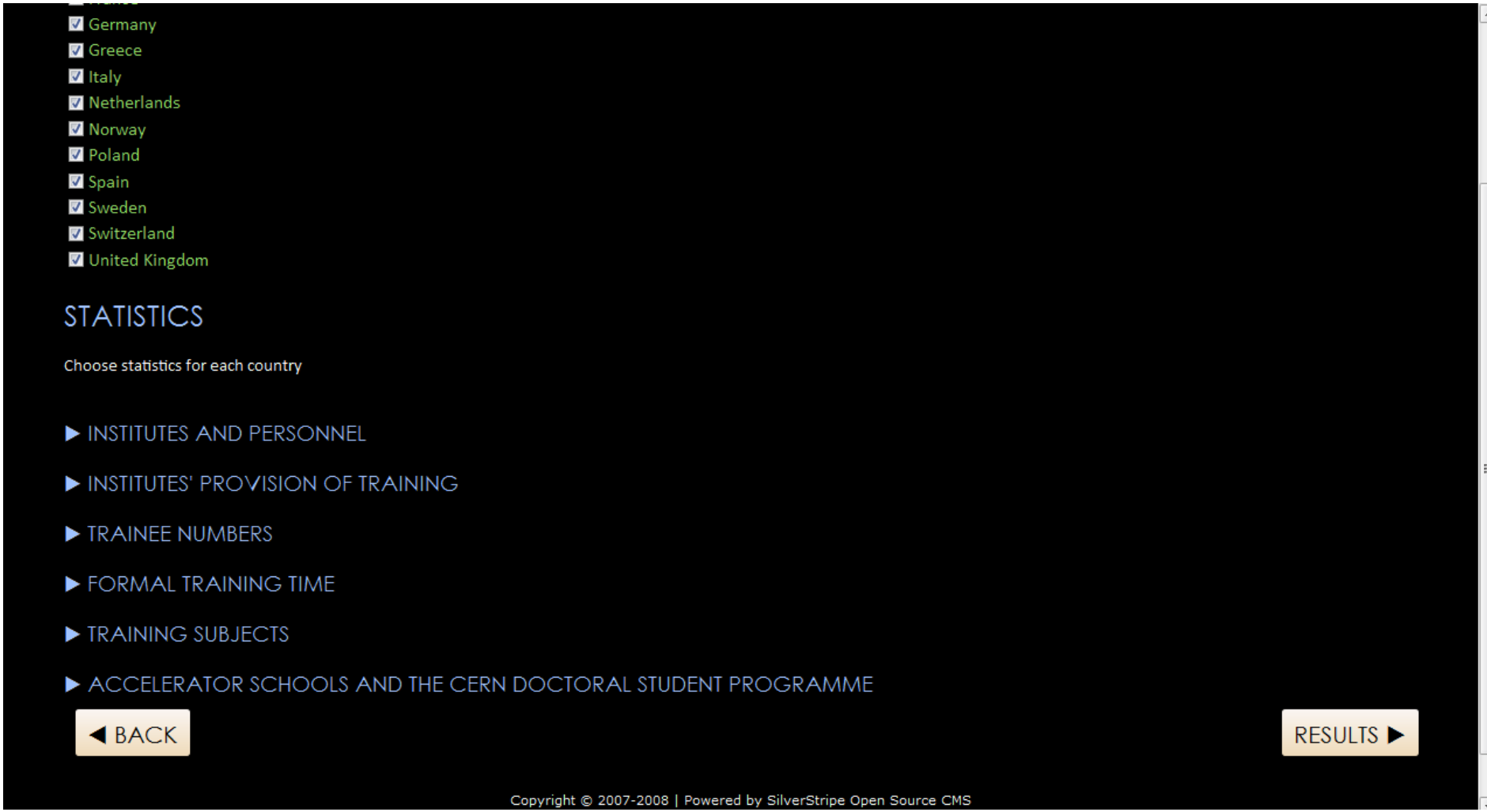

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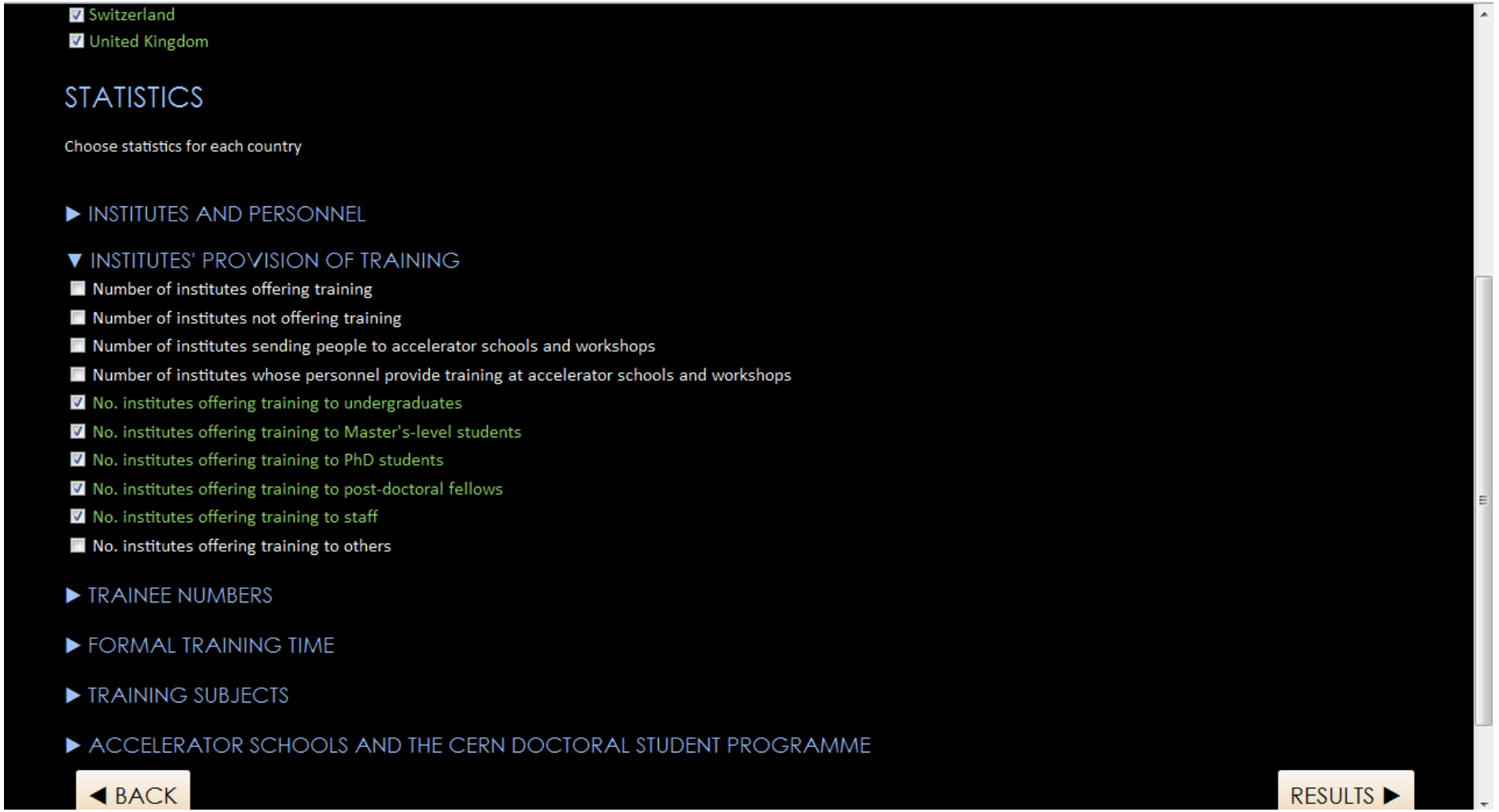

# Example: more sophisticated

| Country | No. personnel providing training | No. institutes offering training to undergraduates | No. institutes offering training to Master's-level students | No. institutes offering training to PhD students | No. institutes offering training to post-doctoral fellows | No. institutes offering training to staff |
|---|---|---|---|---|---|---|
| Denmark | 3 | 0 | 1 | 1 | 0 | 0 |
| Finland | 0 | 1 | 1 | 1 | 0 | 1 |
| France | 47 | 7 | 11 | 10 | 6 | 1 |
| Germany | 60 | 11 | 11 | 11 | 9 | 7 |
| Greece | 3 | 0 | 0 | 0 | 0 | 0 |
| Italy | 9 | 5 | 11 | 8 | 8 | 1 |
| Netherlands | 1 | 0 | 1 | 1 | 1 | 0 |
| Norway | 0 | 1 | 1 | 1 | 1 | 0 |
| Poland | 7 | 3 | 4 | 3 | 1 | 4 |
| Spain | 17 | 4 | 8 | 9 | 4 | 3 |
| Sweden | 6 | 3 | 1 | 1 | 1 | 1 |
| Switzerland | 6 | 1 | 3 | 3 | 3 | 2 |
| United Kingdom | 36 | 8 | 4 | 13 | 7 | 2 |

# Example: more sophisticated

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|---|---|---|---|---|---|---|
| Denmark | 3 | 0 | 1 | 1 | 0 | 0 |
| Finland | 0 | 1 | 1 | 1 | 0 | 1 |
| France | 47 | 7 | 11 | 0 | 6 | 1 |
| Germany | 60 | 11 | 11 | 11 | 9 | 7 |
| Greece | 3 | 0 | 0 | 0 | 0 | 0 |
| Italy | 9 | 5 | 11 | 8 | 8 | 1 |
| Netherlands | 1 | 0 | 1 | 1 | 1 | 0 |
| Norway | 0 | 1 | 1 | 1 | 1 | 0 |
| Poland | 7 | 3 | 4 | 3 | 1 | 4 |
| Spain | 17 | 4 | 8 | 9 | 4 | 3 |
| Sweden | 3 | 1 | 1 | 1 | 1 | 1 |
| Switzerland | 6 | 1 | 3 | 3 | 3 | 2 |
| United Kingdom | 36 | 8 | 4 | 13 | 7 | 2 |

Thanks to Max Bradbury

# Ongoing task

- **'Needs for accelerator scientists' report**
  **→ understand the 'market'**
- **Had discussions at meetings 30 March, 31 May, 12-13 June**
- **A comprehensive survey will be difficult, and probably not effective**
  **→ key customers, case studies**
- **Lot of information in hand; a lot more to do**

# Customers

- **Major laboratories:**
  **CERN, DESY, GSI, INFN, STFC, CEA, CNRS, CIEMAT …**
- **Large projects/facilities:**
  **XFEL, FAIR, ESS, MaxIV, SuperB, IFMIF ..**
- **Companies – list generated by WP3**
- **Medical facilities:**
  **therapy, isotope production …**

# Issues template

- How many accelerator scientists required? Time profiling?
- Of what type? physicist, engineer, technician …
- At what qualification level? PhD, masters, undergrad …
- Dedicated training of staff required?
- Issues of recruitment/access?
- Areas of key skills shortages?

# Initial responses

- **CERN, GSI, CMAM, CIEMAT, UPC, INP Cracow**
- **FAIR, CEA/IFMIF, SuperB**
- **Hadron therapy facilities**
- **A number of companies**
  **(France, Germany, Norway, UK)**
- **Awaiting responses from others**

# Initial observations

- General sense that overall demand for accelerator personnel is increasing
- Hadron therapy facilities: doubling every 8 years?
- ‘On the job training’ is as important as formal qualifications
- Company perspectives:
  - some commercial sensitivity
  - interest in engineers (electronic)
- Key skills: vacuum, surface science, RF …

# Next steps

- Revise ‘issues template’
- Request information from wider group
- Chase ‘key players’ to provide input
- Analyse + digest data
- Write report