

## Work package description for Networking activity or Joint research activity

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Work package number	4			Start date or starting event:					Month 1					
Work package title	Neutrons and Industry													
Activity Type <sup>1</sup>	COORD													
Participant number	1	2	3	4	5	6	7	8	9	10	11	12	13	
Participant short name	HZG	ILL	ESS	HZB	FZJ	TUD	ISIS	PSI	TUM	LLB	BNC	ONV	D T U	
Person-months per participant:	48	36	8	8	8	8	8	8	8	8	8	8	8	
Objectives														
<p>In the past years, large-scale research facilities (LSFs) have increasingly faced the prospect of opening their service to industrial users. Not only is there an increasing demand from industry for advanced analytical research tools provided by neutron and synchrotron light sources, but also there is continuous demand to improve the bridge from basic research on advanced materials to industrial applications. LSFs have the potential to deliver novel solutions for the future key problems of society or general competitiveness of a knowledge based economy not only in the academic world but also in collaboration with industry.</p> <p>The LSFs have always made strong efforts to reach industry by organizing industry days, workshops and individual collaborations, but they face a number of problems in their efforts. For example,</p> <ul style="list-style-type: none"><li>i) the knowledge at companies about analytical techniques available at LSFs is limited,</li><li>ii) industrial scientists often consider access to LSFs as too complicated, too expensive and therefore not worth the effort,</li><li>iii) procedures to clarify IPR issues are lengthy and not transparent,</li><li>iv) often a clear gap is described between the request by a company facing a R&amp;D problem on one side and the way LSF offering a dedicated analysis technique. Industrial researchers are often not aware of the technique itself and/or if he is, they are unable to use the provided raw data, like an academic user would do, and analyse it in the appropriate way to get the desired results. LSFs require to act as mediators between industry and science offering additional service to bridge this gap.</li></ul> <p>In this work package a common effort of LSFs will be developed to deploy common and efficient services for industrial customers and take advantage of synergies created by joint industry outreach activities and complementarity of the various methods and instruments available at the participating facilities. The objective is,</p>														

<sup>1</sup> Please indicate one activity per work package:  
MGT = Management of the consortium; COORD = Networking activity; RTD = Joint research activity.

- to enhance knowledge in industry about possibilities at the participating neutron facilities especially with the upcoming new opportunities at the future European Spallation Source ESS,
- to train and educate interested industrial researchers in the use of these techniques
- to offer a structured and direct access for industrial research to European LSFs
- improve consultation and support for industrial researchers to the demand of industry.

ESS will be a prominent part of the future landscape of European research infrastructures and set new standards in neutron beam intensity and pulse flexibility for scientific questions from physics, chemistry, geology, biology and medicine. Most of the partners of the SINE2020 are already involved in the design and construction of the planned 22 instruments. With new kinds of sample environments and supported by first-class high-performance computing, ESS will enable improved understanding of increasingly complex phenomena.

The WP Neutrons and Industry of SINE2020 will actively provide information, training and education towards European industry to facilitate the access of large companies as well as SMEs to use the unique analytical facilities at the European neutron centres. The WP will coordinate its actions with the recently established Science Link Network , which was created from 2012 to 2014 during the EU INTERREG Baltic Sea Region Programme Project #075. Science Link connected leading research facilities of photon and neutron sources in Germany and Sweden with local universities and contact points to put a new concept of outreach to industry to the test. As a pilot project, serving only four LSF and being limited to the Baltic Sea Region, Science Link showed many advantages in a concerted industry approach. In this WP, the insights will be used and a similar concept will be extended to a large number of LSFs as well as making the consultation by scientific staffs regarding industrial research problems available to companies from the whole EU. Training and access on the use of neutron facilities through industry will be fostered by providing direct support e.g. via the offer of test measurements in the form of feasibility studies in combination with data interpretation by the scientific staff of the LSF. In this way, neutron facilities can demonstrate towards industry its added values as an analytical tool for industry research to develop needed technologies to face key challenges in areas like energy, health, transportation, information technology and environment.

The achievements during the project duration by the WPs Data Treatment Software, Instrumentation and Sample Environment will be implemented into the WPs activities, to enable the most efficient and versatile service to industry possible.

**Kommentar [MT1]:** I added this, because of the focus on the call on ESFRI facilities. Maybe redundant, since similar statement in the main text.

**Description of work** (possibly broken down into tasks), and role of participants

For a detailed distribution of the personnel costs, see Table 4.1.

#### **Task 4A: Network coordination and management**

*Coordination: HZG*

##### **Task 4A.1 Management**

The main task is coordinating WP4 and reporting about the activities to the project management. In addition it contains the interaction between WP4 and the other relevant SINE2020 WPs (e-Learning, Data treatment software, Instrumentation and Sample Environment) as well as other activities for industry outreach like Science Link, related WPs in the TNA activity CALIPSO of synchrotron light sources or other European projects and initiatives. Due to corresponding objectives, the activities will be harmonized with the equivalent WP of a planned INFRASUPP-1 proposal by a synchrotron facility consortium, led by ESRF.

##### **Task 4A.2. Industry Advisory Board**

An Industry Advisory Board is to be established. The IAB will give advice regarding strategic decisions about the various activities, especially regarding a standardized access mode to LSF and intellectual property handling (see Task 4.4)

**Kommentar [MT2]:** How often should IAB meet during the project?

#### **Needed resources:**

*Travel costs: 40 K€*

*12 pm (Month 1 -48)*

#### **Task 4B: Information and Outreach**

*Coordination: HZG, Partners: ILL, ESS, HZB, FZJ, TUD, ISIS, PSI, LLB, BNC, ONV, DTU*

##### **Task 4B.1: Information**

The Information about the service offered to industry by SINE2020, especially the calls for proposals, will be disseminated by electronic newsletters, press releases and the SINE2020 project website. In addition, the partners of this WP will organize and participate in events (workshops, stands on trade fairs, industry relevant conferences, etc.).

#### Task 4B.2: Outreach

The WP4 will develop a roadmap to establish efficient LSF-industry interaction. In Addition to the participation in events organised by other organisations (see Task 4B.1) it will organize presentations and road shows in the participating countries. The road shows will consist of presentations about available analytical methods at the neutron facilities and direct consultation regarding actual R&D problems of companies and ways to solve them by the techniques provided by the facilities.

Support will be needed by local contact points (Chambers of Commerce, Universities, Private Service Providers etc.) to reach the local industry and make sure the events will be frequently visited.

SINE2020 will also host conferences in selected member states, which aim to bring together participants from industry, science and politics, which discuss the future role of cooperation between industry and academic science, with a scope on use of LSF.

#### **Needed resources:**

*Travel costs: 40 K€*

*road shows, conferences, trade fairs: 300 K€*

*68 pm (Month 1 -48)*

#### **Task 4C: Feasibility Studies and Training**

*Coordinator: ILL ; Partners: HZG, ESS, HZB, FZJ, TUD, PSI, LLB, BNC, ONV*

##### Task 4C.1 Feasibility Studies

SINE2020 will offer feasibility studies for industry. The marketing instrument will be calls for proposals which will be coordinated with the Science Link network. Applications will be reviewed by a proposal committee and distributed to the appropriate facilities. The criteria of how the companies will be distributed to the facilities are:

- Making local facilities visible and attractive to their national industry
- Finding the most appropriate instrument/sample environment among the project partners (in case of special instruments are needed, the company will be forwarded to a partner facility within the SINE2020 framework)
- In case of the problem being considered to need synchrotron radiation instead of neutrons, the company will be forwarded to an appropriate synchrotron light source (e.g. via Science Link or the Calipso framework)

- If necessary, it will be suggested to begin with lab based methods first and contact to appropriate partners (Universities etc.) will be established, with the suggestion to come back to the LSF afterwards to go deeper into detail.

#### Task 4C.2: Training

In the frame of the feasibility studies, companies will receive scientific consultation by the facilities experts to bridge the gap between an industrial problem and a scientific solution. In case a company is forwarded to a partner facility or local university, the further process of consultation will be coordinated by the ILO of the companies national facility.

Consultation also contains data analysis for and together with the industry partners. (catalog of software, training, improving manuals, etc., linked to education)

The WP will contain an e-learning platform (together with the SINE2020 WP for e-learning, based on the e-Learning framework created in NMI3) for industry. Online courses modules will be provided to educate industrial researchers in using neutron techniques and data analysis.

A survey will be held in the partner countries to determine the demand and required content of detailed practical courses organized by and at the facilities.

#### **Needed resources:**

*Travel costs: 30 K€*

*76 pm (Month 6 -42)*

#### **Task D: Structured and harmonized Access**

*Coordinator: ISIS Partners: HZG; Observers: all partners*

To enhance the attractivity of neutron sources for industry, it is mandatory to create a harmonized access strategy. This contains the mode of access itself, the financial aspect dependent on the kind, how much of the results will be available to the public as well as the handling of intellectual property rights.

A platform will be developed to structure and harmonize access for industry at the European neutron LSFs giving guidance on individual access routes, consultation points and guidelines on handling the requirements by companies at participating facilities.

A key question in granting access to industry is intellectual property (IP). For many companies it can be a major obstacle in participating in the access programme if the IP issue is not clear. Any

access scheme therefore has to have IP as a central consideration and confidentiality built in from the start. Within this task the goal is to find a scheme that works across different legal frameworks and transparent legal requirements.

**Needed resources:**

16 pm (Month 1 -48)

**Total resources:**

Travel costs: 110 K€

Road shows, conferences, trade fairs: 300 K€

Personnel: 172 pm

**Deliverables** (brief description and month of delivery)

D4.1 Established Industry Advisory Board (IAB) (month 6)

D4.2. final meeting with IAB to discuss results (month 46)

D4.3 Case studies for road shows by every partner (month 6)

D4.4 Case Studies about selected measurements from first call (month 10)

D4.5 Concept of Roadshow and first dates (month 6)

D4.6 Participation in first trade fairs/conferences/workshops (month 13)

D4.7 Industry Service Conference (with participants from industry and politics, month 14) \*\*

D4.8 Final Industry Service Conference (45 month) \*\*

D4.9 Launch 1st call for company proposals (month6)\*

D4.10 First functional e-Learning programme for industry (month 18)

D4.11 Launch 2nd call (Month 12)

D4.12 Launch 3<sup>rd</sup> call (Month 24)

D4.13 Reports from all participating companies about the outcome of the measurement (Month 45)\*

D4.14 Concept of IP policy (month 24)

\*) Dates/Number of Calls to be discussed

\*\*) Conferences still under discussion. Neutron-only conferences for industry are not feasible.



**Table 4.2: List of Deliverables:**

<b>Deliverable (number)</b>	<b>Deliverable name</b>	<b>Work package number</b>	<b>Short name of lead participant</b>	<b>Type</b>	<b>Dissemination level</b>	<b>Delivery date</b>
D4.1	Established Industry Advisory Board	4	HZG			month 6
D4.2	Final meeting with IAB to discuss results	4	HZG			month 46
D4.3	Case studies by every partner about previous industry measurements (month 6)	4	HZG			month 6
D4.4	Case Studies about selected measurements from first call	4	HZG			month 10
D4.5	Concept of Roadshow (with examples from 1st call) and first dates	4	HZG			month 12
D4.6	Participation in first trade fairs/conferences/workshops	4	HZG			month 13,
D4.7	Hosting of Industry Service Conference (with participants from facilities, industry and politics)	4	HZG			month 14 (and annually)
D4.8	Final Project/Industry Service Conference	4	HZG			month 45
D4.9	Launch 1st call for company proposals	4	ILL			month1
D4.10	First functional e-Learning programme for industry	4	ILL			month 18
D4.11	Launch 2 <sup>nd</sup> call					month 12
D4.12	Launch 3 <sup>rd</sup> call					month 24
D4.13	Reports from all participating companies about the outcome of the measurement	4	ILL			month 45
D4.14	Concept of IP policy	4	ISIS			month 24

**KEY**

*Deliverable numbers in order of delivery dates. Please use the numbering convention <WP number>.<number of deliverable within that WP>.*

*For example, deliverable 4.2 would be the second deliverable from work package 4.*



**Type:**

*Use one of the following codes:*

- R: Document, report (excluding the periodic and final reports)
- DEM: Demonstrator, pilot, prototype, plan designs
- DEC: Websites, patents filing, press & media actions, videos, etc.
- OTHER: Software, technical diagram, etc.

**Dissemination level:**

*Use one of the following codes:*

- PU = Public, fully open, e.g. web
- CO = Confidential, restricted under conditions set out in Model Grant Agreement
- CI = Classified, information as referred to in Commission Decision 2001/844/EC.

**Delivery date**

Measured in months from the project start date (month 1)

**Table 4.3a: List of milestones**

<b>Milestone number</b>	<b>Milestone name</b>	<b>Related work package(s)</b>	<b>Estimated date</b>	<b>Means of verification</b>
1	Functional Industry portal at SINE2020 Website	all	month 12	<ul style="list-style-type: none"> <li>- user portal</li> <li>- methods descriptions</li> <li>- case studies</li> </ul>
2	Agreement with IAB about IP handling and access mode		month 12	-
3	Concept of road show	e-Learning	month 12	<ul style="list-style-type: none"> <li>- Number, kind and content of presentations</li> <li>- plan, at which events/locations it will be shown</li> </ul>
4	Functional e-Learning programme	e-Learning	month 24	- Frequent usage by industry
5	First model for Structured and harmonized Access of European LSF by industry		month 24	- Experiences from first 2 or 3 calls for proposals and measurements performed
6	30 Feasibility studies	Software, Sample environment, Instrumentation	month 48	<ul style="list-style-type: none"> <li>- Samples by industry measured</li> <li>- results analysed and provided to industry partners</li> </ul>
7	Final model for Structured and harmonized Access of European LSF by industry		month 48	- Experiences from outreach activities first calls for proposals and measurements performed

**KEY**

**Estimated date**

*Measured in months from the project start date (month 1)*

**Means of verification**

*Show how you will confirm that the milestone has been attained. Refer to indicators if appropriate. For example: a laboratory prototype that is 'up and running'; software released and validated by a user group; field survey complete and data quality validated.*

**Table 4.3: Critical risks for implementation**

<b>Description of risk</b>	<b>Work package(s) involved</b>	<b>Proposed risk-mitigation measures</b>
Insufficient participation of industry in feasibility studies	Task A, B, C, E	<ul style="list-style-type: none"> <li>- Roadshows</li> <li>- Conferences</li> <li>- Trade fairs</li> </ul>
Unsatisfying outcome of measurements	Task C, D	Intense consultation before experiments