



# ESS & MAX IV: Cross Border Science and Society

Utilize the opportunities of the globally unique  
ESS and MAX IV research facilities



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Cross Border  
Science and Society

**Interreg**

Öresund-Kattegat-Skagerrak  
European Regional Development Fund



EUROPEAN UNION

ESS & MAX IV: Cross Border Science and Society

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Photos: Leif Jansson (cover), Jenny Andersson (page 3), ESS (page 4), Kennet Ruona (pages 6, 9 and 13), Thomas Christiansen (page 10), Johan Wessman (page 14).

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# ESS & MAX IV: Cross Border Science and Society

The ESS and MAX IV research facilities form a globally unique research hub in the areas of materials science and life science. The ESS & MAX IV: Cross Border Science and Society interreg project has invested a total of EUR 19 million on increasing cross-border regional cooperation by teaching young researchers how to use the techniques available at ESS and MAX IV, increasing connections with the business sector and developing marketing about our research region. Measures to induce talented people to stay in the region and the reduction of border-related barriers are additional contributions made in order to maximize the utility of these facilities for Sweden, Denmark and Norway



# ESS and MAX IV

In the new district Brunshög, in the northern parts of the city of Lund in Sweden, two world class research facilities are situated. The synchrotron X-ray source facility MAX IV was operational already in 2016, whereas the neutron spallation source ESS will start operations from 2020 and will be fully operational in 2023. In short both facilities situated next to each other in Lund can be used to examine materials in various ways. The research facilities can be used for basic research, but scientists and companies may also use the facilities for applied research.

MAX IV is hosted by Lund university and financed within the framework of Swedish research grants, ESS is a European Research Infrastructure Consortium (ERIC), where the governments of Sweden and Denmark jointly finances the construction costs with 47.5 % of a total budget of 1.8 billion euros. Apart from the spallation source in Lund, ESS also operates a Data Management Center in Copenhagen in Denmark.



# A regional, cross-border perspective

ESS and MAX IV create a fantastic base for both research and society, in general. In order to develop this potential, 27 organisations in Sweden, Norway and Denmark have been working for three years on the largest project in history of the Interreg Öresund-Kattegat-Skagerrak programme. Eight universities, ESS and MAX IV, government agencies, marketing organizations, regions and municipalities have been engaged in wholly new methods of cooperation.

The main pillars of this project have been a holistic perspective, synergies and cross-border added value. Researchers, marketing organizations and government authorities have worked in concert with all the parts of this project using their efforts to reach the same goals, and sharing knowledge across borders has resulted in new skills and expertise and stronger networks. This project has been very clearly focused on both research and regional development.

The project has also worked with enhancing communication with national government agencies in the three countries and increasing connections with the business sector.

” This project clearly identifies the regional development values that exist here. It is concrete in all its components, and based on the needs of the facilities, regardless of whether these relate to research, international attractiveness, border-related barriers, suppliers or marketing of the region as an advantageous location for the R&D divisions of major global companies. There is no doubt that we will find the experiences we derive from this project to be of great use in the future and will be able to use our new knowledge and insights in other contexts and projects .

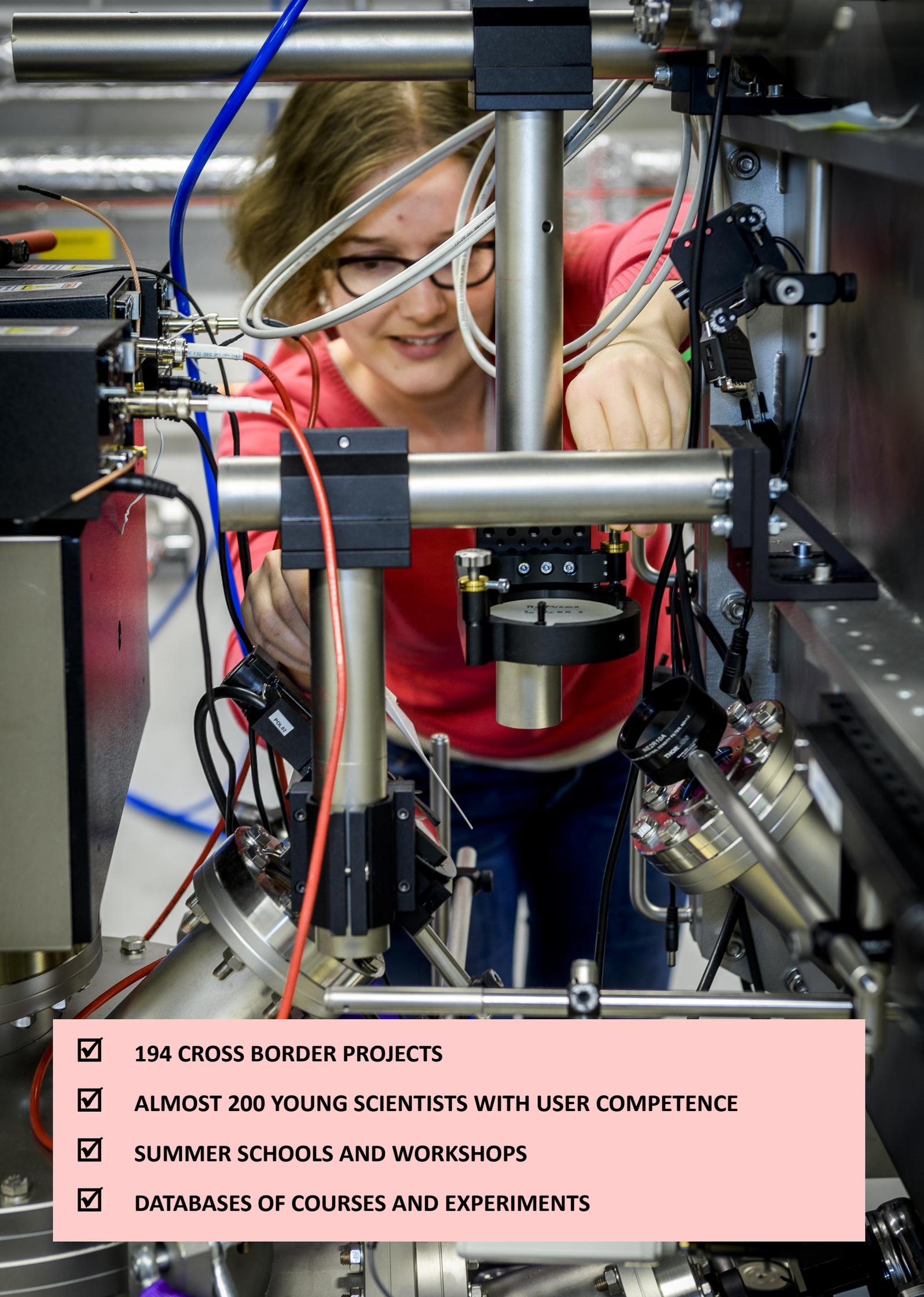
*Daniel Persson, deputy director for regional development and chair of the project steering committee, Region Skåne*

” The Capital Region of Denmark views “ESS & MAX IV: Cross Border Science and Society” as a fine example of a successful Greater Copenhagen cooperative undertaking and, at the same time, emphasizes the importance of increasingly moving in the direction of combining our talents and abilities across regions and municipalities in order to ensure that the competitive ability of Greater Copenhagen to assert itself globally .

*Christian Bruhn Rieper, deputy director for regional development, Capital Region of Denmark*

” The project has demonstrated that it is possible to cooperate with many partners across borders, provided all the participants are sufficiently desirous of the outcome. The fine results obtained by this project also show that building a good consensus and having strong drive amongst all the partners are the crucial conditional for this type of large project.

*Magnus Schönning, head of program, Interreg Öresund-Kattegat-Skagerrak*

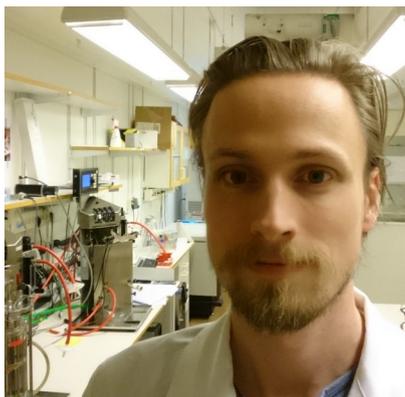


- ✔ 194 CROSS BORDER PROJECTS
- ✔ ALMOST 200 YOUNG SCIENTISTS WITH USER COMPETENCE
- ✔ SUMMER SCHOOLS AND WORKSHOPS
- ✔ DATABASES OF COURSES AND EXPERIMENTS

# MAX4ESSFUN

## Cross border network and graduate program

194 six-months experiments, corresponding to 1200 months worth of training for young scientists and almost 600 months worth of supervising from senior researchers. With a cross border perspective the work package MAX4ESSFUN has developed a unique model for establishing a comprehensive expertise around MAX IV and ESS, taking advantage of the different strengths from the participating universities.



“A whole new field of experimental opportunities have opened up for me through the experience I’ve gathered during the project and the threshold for me using these methods have been lowered considerably. The facilities are truly top of the line technology, so it’d be super cool using them!

*Mikael Andersson, PhD student at University of Gothenburg*

Read more interviews with young scientists at  
[www.scienceandsociety.eu](http://www.scienceandsociety.eu)



Eight universities in Sweden, Denmark and Norway have collaborated together with ESS and MAX IV within the project work package MAX4ESSFUN. In order to create a cross border network between researchers and to get young scientists used to the scientific methods of synchrotron light and neutrons, a unique model has been developed. Young scientists with a supervisor have made six-months experiments together with a co-supervisor from another country or from the research facilities. The project set the ambitious goal of conducting 176 experiments during a three-year period. In total 242 applications for grants were filed and 194 experiments were approved and conducted within the budget of the project.

This is one of several initiatives aiming to strengthen the expertise on the methods and technologies used by MAX IV and ESS and the MAX4ESSFUN-model has both caught attention and reached significant success.

“Cooperation within the project has been very cordial and it has been shown that there are fantastic synergies to gain with a project in this area. I’m eagerly awaiting the results from the experiments and I hope these can lay the foundations to many more joint projects in the future.

*Kell Mortensen, professor, University of Copenhagen*



# Regional Supplier Base

How should the regional business community in Skåne and Zealand benefit from the fact that there are two world-leading research facilities in the Öresund region? Both ESS and MAX IV will need to be maintained, and in all probability, supplemented and physically expanded during its period of operation. The facilities are at the cutting edge in the design of X-ray and neutron spallation, and the suppliers are often global companies. But where are suppliers from Skåne and Zealand in this process? Which potential suppliers exist, and in that case, are they ready to contribute to the construction and maintenance of the facilities?



“In the next few years, there will be tremendous opportunities for suppliers serving ESS, and this makes the Regional Supplier Base sub-project even more important to the efforts to help regional actors learn how they should handle themselves in the procurement process.

*John Womersley, director general, ESS*

The business community of the region has unique opportunities to raise its skills and expertise and work together with researchers. Nothing, however, gets done by itself. One needs to make contacts, build up networks and find business opportunities. This was something that the project understood and utilized when the Regional Supplier Base was planned.

The Danish Big Science Secretariat has administered the Regional Supplier Base together with Region Skåne and the IUC Syd industrial cluster in Sweden. The purpose of the Regional Supplier Base was to increase business opportunities in Big Science for Swedish and Danish companies.

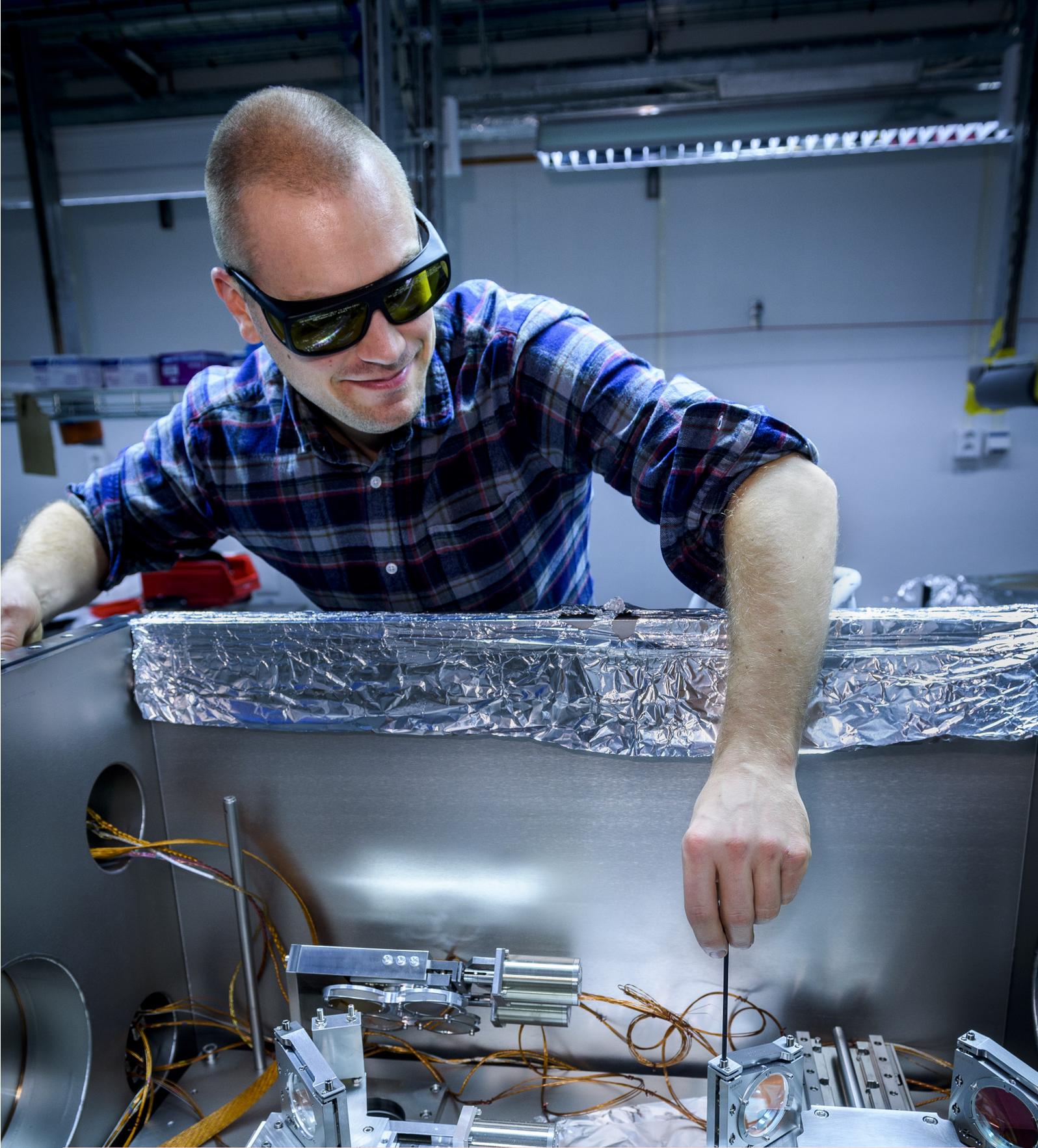
This work package has prepared analyses, which in turn, have served as the factual foundation for the Regional Supplier Base. This work, to a great extent, has used workshops, study visits and networking to increase the knowledge and competence of potential suppliers to the research facilities in Skåne and Zealand.

As a result of the efforts to create a regional supplier base, the participants of this work package also developed better insight into what skills and expertise would be required in the future to both serve and maintain the research facilities, and what will be required of both the regional and national level in order to create optimum conditions.

One contributing effect of the sub-project is the fact that the Swedish Government and the Swedish Research Council established Big Science Sweden, in many respects using bigscience.dk as a model, thanks to the frequent contacts that were maintained during the course of the work package.

“The Regional Supplier Base has opened the doors for us to the often complex world of the research facilities. We have already gained new contacts and new customers in Denmark, Sweden, Holland, Germany, France and Italy, so far. The network that this project and now, Big Science Sweden, can offer is very valuable, but requires plenty of active participation in order to achieve the optimum results. Big Science Sweden is an excellent initiative and we look forward to more cooperation that will create added value.

*Leif Gjerløv, Head of sales, Carlsson och Möller AB in Helsingborg*



- ☑ **ANALYSIS OF THE FACILITIES NEED FOR SUPPLIERS**
- ☑ **ANALYSIS OF THE REGIONAL COMPANIES NEED FOR COMPETENCE**
- ☑ **STUDY VISITS, LECTURES AND WORKSHOPS**
- ☑ **CROSS BORDER NETWORKS**

- ☑ IDENTIFYING THE REGION'S STRENGTHS WITHIN MATERIAL SCIENCE AND LIFE SCIENCE
- ☑ FOUR VALUE PROPOSITIONS
- ☑ TOOL KIT TO BE USED BY INVESTMENT MANAGERS IN THE REGION



# International Attractiveness

ESS and MAX IV offer unique opportunities in studying samples and materials on a nano-level using the most advanced world-class techniques available. Synchrotron X-ray and neutron spallation techniques complement each other and present a unique scientific scope for both life sciences and material sciences. The strategic locations in Lund and Copenhagen presents many opportunities for growth and development for both researchers and industry in the area.

How can Greater Copenhagen and southern Sweden market itself as a world class science region using ESS and MAX IV? Regional and local governments in Skåne and Copenhagen as well as the research facilities themselves and surrounding science parks have jointly marketed the region within the ESS & MAX IV: Cross Border Science and Society project.

During the project period, the work package has produced a benchmark analysis and participated at and hosted international conferences. The work package has also produced so called Value Propositions, presenting arguments for investing in the region, on oncology, hydrogen, food & packaging, and nano technology,

” The analysis the work package has developed we couldn't have developed on our own. They will be really useful to all partners in the work package, so we are very grateful for that.

*Anette Orheim, Communications Manager at Medicon Village in Lund*



Approximately 1000 international companies within the focus areas have been approached by investment managers from Invest in Skane and Copenhagen Capacity, resulting in 20 qualified leads and two materialized investments.

*Download analyses and value propositions at  
[www.scienceandsociety.eu](http://www.scienceandsociety.eu)*



” Participating in the conference was valuable, as it was a good balance between attending researchers and companies. We met some interesting companies within our area of expertise. I hope we will be able to conduct some concrete business or common projects with at least two companies we met at the conference.

*Rambabu Atluri, CEO Infingent Innovations*



# Welcoming of International Talents

ESS is attracting many experts from all over the world. But how well prepared are government agencies and municipalities to welcome these experts, together with their accompanying partners and children? What can we do to make visiting researchers feel welcome when they come to the Öresund region, so that they will want to remain and settle here?



” It is important to motivate talented people to want to come here, enjoy living here and stay as long as possible. That’s why cooperation across the Sound is so important. Together we can ascertain what kind of challenges these individual face, and act to influence decision-makers on both the regional and national level.

*Stefan Johansson, CEO, Invest in Skåne*

The City of Copenhagen International House and Invest in Skåne have administered the Welcoming of International Talents work package and have worked together with the cities of Helsingborg, Lund, and Malmö, and Copenhagen Capacity.

This work package has focused on improving service directed to international talents who move to the Öresund region through cross-border cooperation, mapping the current situation and sharing experiences.

By working in this work package, the various reception organisation have needed to cooperate and take a holistic position on welcoming international talents. This cooperation as make joint events and activities possible, and has especially promoted the sharing of experiences. Thanks to this project, a cross-border perspective has come to characterize the work of all the reception organizations.

In the future, they will be able to offer a joint range of services and will be larger and more comprehensive than ever before.

As part of the work package, a cross-border International Talents Forum has been established. This is a web-based panel of international talents who have moved to the region including a web-based checklist, a kick start programme for accompanying partners, as well as marketing materials for reception organizations in regions, municipalities and companies.



” The Kick Start Programme was much better than I could have imagined. They managed to gather all important information in one place. I got everything I needed, right away. It was a fine mixture of theory and practice, and the fact that all this was free of charge was fantastic.

*Marta Bochniewicz, participating in the Kick start programme in 2016*

- ☑ INCREASED CROSS BORDER EXCHANGE OF KNOWLEDGE AND EXPERIENCE
- ☑ CHECK LIST FOR INTERNATIONAL TALENTS
- ☑ KICK START PROGRAMME
- ☑ MARKETING MATERIAL
- ☑ CROSS BORDER EVENTS FOR INTERNATIONAL TALENTS





- REPORT IDENTIFYING CROSS-BORDER BARRIERS FOR BOTH EU-NATIONALS AND THIRD COUNTRY NATIONALS**
- LONG TERM LOBBYING STRATEGI**
- LEX ESS IN DENMARK**

# Cross-Border Barriers

Once ESS and MAX IV are completely finished, many international researchers will be working here. The research facilities will be located in Lund, and the data processing by ESS will take place in Copenhagen. Many who are associated with the research facilities will commute across the border. The researchers and experts will come not only from the EU but also from the rest of the world (third-country nationals), and this requires a new perspective on the issues surrounding cross-border barriers.

The Greater Copenhagen & Skåne Committee has administered the Cross-Border Barriers work package, and has worked with government agencies in both Sweden and Denmark, as well as ESS, the County Administrative Board of Skåne and Öresunddirekt in Copenhagen. The joint efforts of these entities have been based on various typical scenarios and have brought together experts from various areas to both identify barriers and find solutions. This approach has been very much appreciated by the government agencies involved. As a result of this work package, the agencies and research facilities have established a closer dialogue with each other and have together created a permanent network. This will make it easier to solve any problems that may arise in the future, as there now exist established channels for the parties to use.

” In the context of this project, we have had excellent cooperation and formal channels of communication between the tax authorities in Sweden and Denmark. We were therefore able to identify, early on, cross border barriers regarding income tax. During the project, we have also taken the initiative and deepened our knowledge of taxation of experts both in Sweden and Denmark.

*Ann Wirén, Swedish Tax Authority*

This work package has also enabled the participants to forge contacts with actors in other work package within ESS & MAX IV: Cross Border Science and Society, as well as link researchers who have personally experienced cross border barriers to the relevant government agencies.

In addition to mapping the various cross border barriers that third country nationals are expected to face in the Öresund Region, this sub-project has also raised cross border barrier issues in both the contexts of Greater Copenhagen cooperation and Nordic cooperation. In addition, the work package was directly active in affecting the content of the new law regarding ESS employees in Denmark, known as the *Lex ESS*.

*Download the reports at  
[www.scienceandsociety.eu](http://www.scienceandsociety.eu)*



” The work regarding the needs that the project identified (e.g. reduced cross-border barriers between Denmark and Sweden and improved services for accompanying partners) will continue after 2018. Consequently, it is important that the project partners continue to work with these issues even after the conclusion of the project.

*Pia Kinhult, Head of Host State Relations, ESS*

# Strategic platform for cross-border discussions

This project has created a platform for strategic discussions between Sweden, Denmark and Norway in an effort to promote a good consensus and express more precisely future needs and opportunities.

On five occasions, the project has held “Strategic forums” at which various themes have been discussed from a regional cross-border perspective. These have included how we should develop the Science Village Scandinavia research village, how we can promote innovations based on ESS and MAX IV, and how we can increase cooperation with DESY and the European XFEL research facilities in Hamburg.

The project has had an Advisory Board, where those on the national level in Sweden, Denmark and Norway met with business organizations, the research facilities, regional representatives and their EU office. Thanks to the Advisory Board, the project has gained new perspectives from various levels and areas of expertise, while at the same time applying results to the national and international levels. One important factor has been the project’s connection to the national strategies of each of the three countries for ESS and MAX IV. The discussions have also strengthened ties amongst the actors in the group and initiated new interfaces for cooperation.



” It was very inspiring to be part of the Advisory Board and learn about the Danish and Swedish national strategies for efforts relating to ESS and MAX IV.

*Eva Dugstad, representative of the Norwegian Research Council in the Advisory Board*

In the steering committee and coordination group of the project, links between the various sub-projects have developed and the focus has been on sharing knowledge between countries in an effort to develop areas of strength and create a holistic view. The project has also participated in a range of different venues such as the Folkemødet (People’s meeting) on Bornholm and the EU Commission’s unit for smart and sustainable development, in order to carry on a discussion regarding the issues related to the project.

” Some of the initiatives that were described in the national ESS strategy have already been carried on within the context of the project, such as our databases of the courses that provide an overview of the opportunities to gain an education in the field. So it was also rewarding to be able to contribute in this way .

*Sine Larsen, professor, University of Copenhagen*



# Horizontal criteria became standard operating procedures

The project has established “standard operating procedures” that promote gender equality, diversity and sustainable development, based on the “horizontal criteria” that are defined by Interreg, which is financing this project. The basis for this has been that these perspectives are a positive factor for development and a way to maximize the potential of both the project and organizations.

The standard operating procedures were based on establishing synergies and regional cross border added value as key concepts for the project. The objectives included minimizing environmental impact from transportation, promoting climate-smart food and minimizing use of resources. In addition to concrete measures taken, the goal of the project was to provide inspiration for long-term, positive change of norms, choices and patterns both within the project and in broader contexts.



” Clarity and good examples from the project administration have made it natural for us in the MAX4ESSFUN work package to work assiduously with horizontal criteria. For example, we have been careful to really set aside time to discuss issues such as gender equality. We have actively contacted women in order to achieve as even a gender distribution as possible in MAX4ESSFUN, and we have been diligent at compiling statistics of all applications received and granted. As a result

of this project, actively applying horizontal criteria has become more of a given rather than merely an option.

*Kajsa M Paulsson, scientist, Lund University*

” I think that the project has succeed very well in integrating horizontal criteria in its work. The work involved in preparing the standard operating procedures for the project is a textbook example of how working with the horizontal criteria can be integrated in the ongoing progress of a project.

*Lone Hylander, project councillor, Interreg Öresund-Kattegat-Skagerrak*



# A strong basis for future cooperation

The many concrete results and strong regional cross border networks that were created in the context of the project form a fine basis for the future. The project has made an impression, through results such as increasing knowledge on the part of young researchers, cooperation between Swedish and Danish organizations that provide assistance to international researchers in our region, and joint Swedish-Danish marketing of our strengths in materials science and life science in fairs and conferences throughout large parts of the world.

A continued frequent dialogue between the research facilities and the university, national level, EU level, regions and other actors will be very important in ensuring that ESS and MAX IV will provide the maximum benefits for research and our society.

In the future we will need to expand cooperation interfaces additional by seeking closer ties with DESY and European XFEL research facilities in Hamburg. This will create opportunities to jointly develop an even larger research region, and increase its international attractiveness from a global perspective.

” The project has begun with a large number of activities that will continue. Our involvement in the “Cross-Border Barriers” and “Welcoming International Talents” sub-projects have created excellent contacts with government agencies, and present opportunities that will continue to grow. This lays the ground work to giving international researchers in our region the best possible conditions.

*Pia Kinhult, Head of Host State Relations, ESS*

” This project has been an eye-opener for Lund University as to the holistic approach we need to use in our work, in which other sub-projects have worked with problems, challenges and marketing strategies. We not only need to talk about research but also about recruitment and attractiveness. We now see ourselves as part of something much larger, and we realize that we can jointly market ourselves as a research region. In doing so, our academic institutions will get much more visibility .

*Stacey Sörensen, deputy vice chancellor, Lund University*

” Overall, it is important for the University of Oslo to participate in the major joint strategic efforts being undertaken in Greater Copenhagen so that we can be an integrated part. It was been a very meaningful step to work with Greater Copenhagen and as a next step we should be able to get close to Hamburg.

*Helmer Fjellvåg, professor, University of Oslo*

” This project’s strength is that it involves and activates the major interested parties. We have succeeded in building concrete cooperative structures. And this fact, I am convinced, will have important effects in the future. Those who work with these issues have gotten to know their counterpart on the other side of Öresund, and I am sure that this will have positive impact on the future, because it is important to know whom to call in order to get things accomplished .

*Fredrik Melander, Head of R & D-relations, Science Village Scandinavia*

# The ESS & MAX IV: Cross Border Science and Society project

ESS & MAX IV: Cross Border Science and Society was a Danish-Swedish-Norwegian project that aimed to seize opportunities brought by the region through the construction of two world class research facilities in Lund, Sweden: The European Spallation Source (ESS) and the MAX IV-laboratory, part of Lund university.

The project was led by Region Skåne and the Capital Region of Denmark, and the project period was from September 2015 to August 2018. The project, which was co-funded by the European Regional Development Fund with 9.5 million euros, was the largest project in the history of the Interreg Öresund-Kattegat-Skagerrak programme. The project included 27 partners in Denmark, Norway and Sweden and was divided into six different work packages:

- MAX4ESSFUN
- Cross Border Barriers
- International Attractiveness
- Welcoming International Talents
- Regional Supply Base
- Strategic Platform

## Partners

Aarhus University, Big Science Secretariat (DK), Capital Region of Denmark, Chalmers University of Technology, City of Copenhagen and International House Copenhagen, City of Helsingborg, City of Lund, City of Malmö, Copenhagen Capacity, County Administrative Board of Skåne, Danish Tax Authority, ESS, Greater Copenhagen & Skåne Committee, IUC Syd (SE), Invest in Skåne, Lund University and MAX IV, Malmö University, Medicon Village, ÖresundDirekt Copenhagen, Region Skåne, Science Village Scandinavia, Swedish Public Insurance Agency, Swedish Public Employment Service, Swedish Tax Authority, Technical University of Denmark (DTU), University of Copenhagen, University of Gothenburg, University of Oslo

*All results from the project can be found at*  
[www.scienceandsociety.eu](http://www.scienceandsociety.eu)



## Interreg Öresund-Kattegat-Skagerrak

Interreg Öresund-Kattegat-Skagerrak is an EU programme in which certain regions in northern Denmark, southern Sweden and southern Norway can apply for co-financing in order to carry out joint projects in four areas: innovation, the green economy, transport and employment.

