

# TITA

REGIONAL MOBILISATION  
AROUND ESS AND MAX IV  
FINAL REPORT – SHORT VERSION



SOCIETY FOR SCIENCE  
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# TITA – a unique project

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**B**etween 2010 and 2012, Region Skåne collaborated with 42 other stakeholders in Skåne and Blekinge in the TITA project. The acronym TITA stands for Growth and Innovation (TI) and Accessibility and Attractiveness (TA). The project, which has been co-financed by the EU, was designed to see how regional stakeholders can maximise the societal benefits and capture spin-off effects that could be generated by the establishment of the ESS and MAX IV facilities. The mobilisation and subsequent collaboration between so many local and regional stakeholders within the framework of a joint project in Skåne and Blekinge is unprecedented.

The European Spallation Source (ESS) and MAX IV research facilities are the largest scientific investments ever made in Sweden. Of the approximately SEK 18 billion that ESS and MAX IV will cost to build, Sweden will be responsible for approximately SEK 8 billion. The facilities

will lead the world in their respective areas of specialisation and offer researchers unparalleled levels of performance.

## **European Spallation Source (ESS)**

The ESS will be a multi-disciplinary research centre based on the world's most powerful neutron source. Researchers will be able to study a wide range of materials from plastics to medicines at the atomic level and thereby have a better understanding of their structure and function. The technique uses neutrons as a tool to analyze the material at the molecular level. Research with neutrons can be likened to a large microscope, where neutrons are used instead of light to 'see' the material.

The ESS will be about 30 times more advanced than any existing facilities and will open up new research opportunities in such disciplines as biology, chemistry, archaeology, medicine, environmental technology, energy, climate, transportation and engineering.

The ESS is a European research project; 17 countries are participating as partners. The building of the facility is planned to begin in 2014, be ready for opening in 2019 and be fully operational by 2025.

## **MAX IV**

MAX-lab in Lund is a Swedish national laboratory. Research using synchrotron radiation technology has been conducted here since the mid-1980s. MAX stands for Microtron Accelerator for X-rays. On completion, the new MAX IV facility will be a much larger version of the latter and, as such, be one of the most advanced synchrotron radiation facilities in the world. Synchrotron radiation is electromagnetic energy; it is used to study how materials are structured and how different processes in materials occur, as well as to identify the chemical state or condition of materials.

MAX IV is expected to open up new advances in a number of research fields; these include material sciences, life

sciences, nanotechnology and energy, climate and environmental sciences. Users can be found in a wide variety of disciplines including physics, chemistry, biology, medicine, technology, palaeontology, geosciences and environmental science. MAX IV is expected to be completed in 2015.

## **Who will work at ESS and MAX IV?**

ESS and MAX IV are in the process of recruiting staff to work in their organisations, they will need administrative staff, technicians and scientists. When the facilities are in full operation approximately 450 people will be employed at ESS and about 250 at MAX IV.

International experts are expected to number a few hundred. Apart from permanently employed staff, some 4000 to 5000 people will visit the facilities each year to carry out experiments; the average stay of the latter will be from a few days to a few weeks.



# What conclusions has the TITA project come to?

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The establishment of the two unique research facilities ESS and MAX IV in Lund brings significant opportunities to southern Sweden. Although the construction and operation of the completed facilities will give regional businesses an opportunity to take home contracts worth millions of Swedish kronors, it is in the long-term that the really big gains and benefits are to be found. The potential spin-off effects can help create a regional climate that promotes innovation and competitive advantages supported by a world-class knowledge region; these effects will facilitate and encourage new start-ups as well as attract highly qualified and sought-after competences to the region. The Öresund Region brand will also benefit as it grows in importance as an international meeting place for materials research. The prerequisite for this scenario is that regional stakeholders continue the mobilisation process.

## **TITA's conclusions**

- Growth will not happen by itself
- The region requires a readiness for ideas and people
- Skåne – the place to be



## Growth will not happen by itself

There is no doubt that the ESS and MAX IV facilities can be a new driving force for both regional and national businesses. The key to maximising this opportunity and benefitting the general public depends upon how well the region succeeds in creating conditions that allow the facilities to operate in symbiosis with the surrounding society. But growth will not happen by itself; it will require long-term, goal-oriented and proactive efforts from stakeholders representing a variety of interests.

### Competence – a key issue

Competence, knowhow and skills are a prerequisite for growth and innovation. To strengthen Skåne as an important and recognised centre of higher education and training is perhaps the single most important issue for the region's future. The availability of a qualified and highly skilled workforce is not only an important competitive factor, but a necessity if the region is to be able to compete in a global market. Education and labour market forecasts indicate a growing gap between the demand and supply of engineers, technicians and scientists. As the demand for these skills

will further increase with the establishment of ESS and MAX IV, it is vital that the suppliers of education at all levels address this issue and work to ensure that the demand can be met.

- Municipalities, universities, research facilities and industry associations must collaborate and develop sustainable, long-term competence supply and development plans.
- Investments in technology and science must begin as early as preschool and follow students throughout their education.
- ESS and MAX IV related topics must be included in junior and senior high schools, colleges, universities and other centres of higher education.

The facilities need to take strategic actions by:

- establishing a relevant educational and training infrastructure
- allocating beam time for training purposes and
- funding necessary support functions within the facilities.

In parallel with the aforesaid, educational and training investments directed at the business community and support functions for industry related research must be established.

### Support for industry

The construction and operation of ESS and MAX IV is a unique opportunity for Sweden and the region to strengthen and promote Swedish industry and its ability to supply and use research facilities both in Sweden and abroad. In order to fully exploit this opportunity, industries must firstly develop strong links with the facilities and academia and secondly create

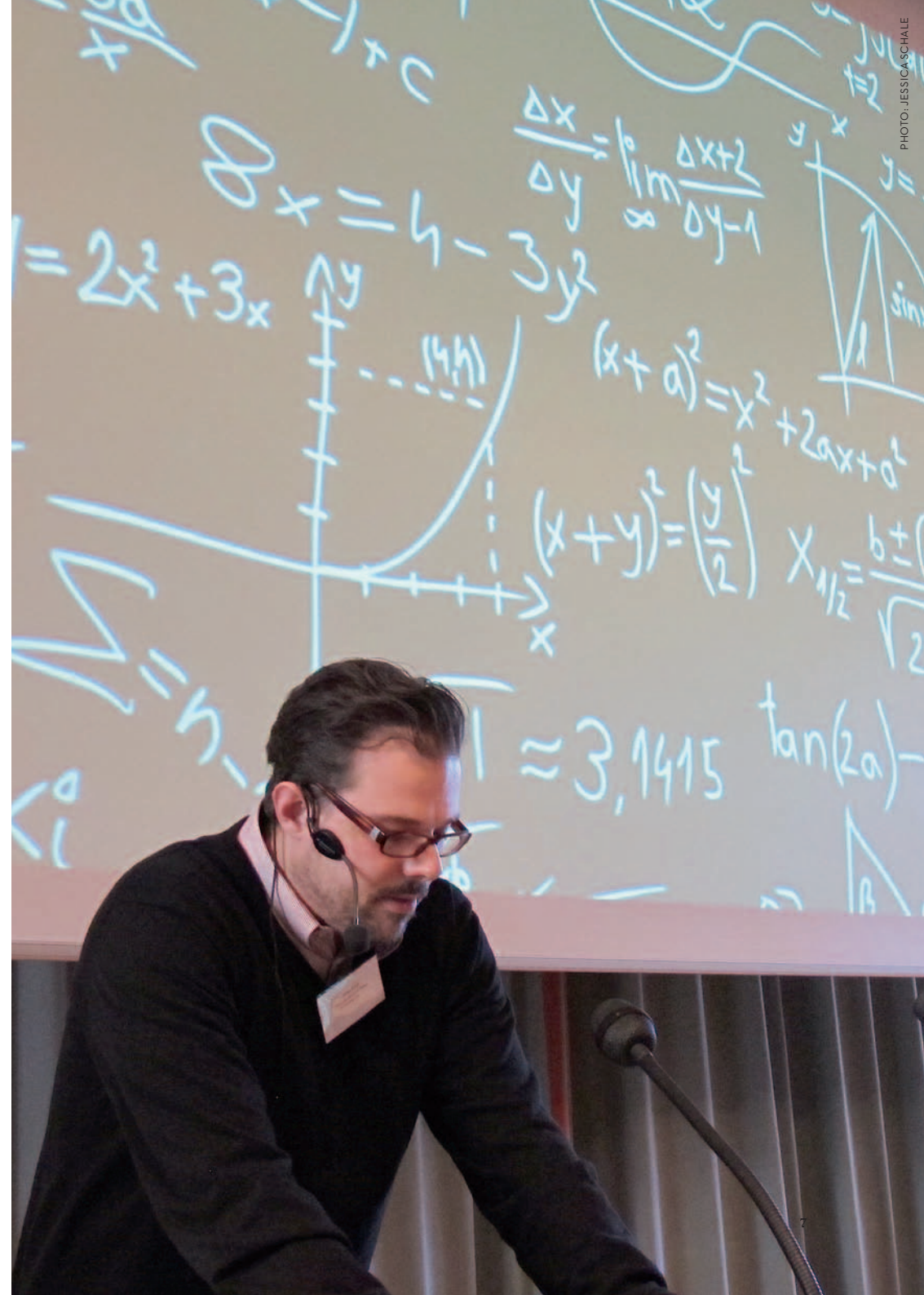


PHOTO: JESSICA SCHALE





support functions for both the supply to and use of ESS and MAX IV.

### **With a focus on suppliers**

During the past couple of years, TITA has supported companies in southern Sweden when it comes to: monitoring contracts, tenders and quotes with ESS and MAX IV, the establishment of consortia, and the development of skills. One could usefully scale up this initiative to a national level. In the long-term, this initiative need not be limited to ESS and MAX IV; it could also include Swedish undertakings with foreign research facilities.

It is difficult to see how private stakeholders could or would be willing to take on such a supporting role. The role of the public sector is therefore crucial to how well a company with the potential to supply goods or services to ESS and MAX IV will succeed; this also applies to subcontractors. Through the delivery of goods and services to the facilities there are great opportunities for the transfer of technology, knowhow and innovation between the business community and the research facilities.

### **With a focus on users**

There is a clear correlation between increased industrial usage and the positive effects on regional growth. Therefore, from a regional growth perspective it is important that the region and Sweden develop a long-term action plan that is designed to strengthen the ties between industry and ESS and MAX IV. Analyses from TITA's international case studies emphasise that this is not a job that can be put on the back burner and should be initiated immediately. An important perspective on the

question of industrial usage is the availability of functions that will offer services to companies and research groups at ESS and MAX IV. This is a prerequisite for major industrial usage; international users will always be attracted to the facilities that can provide the best service. To adopt a passive market-driven approach where industry is expected to understand and promote the ESS and MAX IV facilities is therefore ill-advised; one proposal is to establish a research institute funded by a broad spectrum of stakeholders with a strong foothold in industry.

### **National and international stakeholders are important**

Collaboration between regional and national stakeholders is required to meet the challenges of establishing and strengthening the links between the ESS and MAX IV facilities and the business community. It is also important that the region maintains an international perspective with respect to initiatives that are related to ESS and MAX IV. This is about learning from others, strengthening cooperation and collaboration with the research infrastructures of Denmark and northern Germany, and promoting the supply of goods and services to other overseas research and development infrastructures. The region has the potential to become a focal point – a melting pot – of skills, capital, and research related to materials sciences. Given the small size of the research communities in Sweden, the number of users and manufacturing companies, access to venture capital, etc., it is vital that the potential is recognised and fully exploited.

## The region requires a readiness for ideas and people

To maximise the societal benefits, plans are needed to capture and exploit ideas and welcome people and businesses. These plans must cover everything from the wise use of undeveloped building land to how we attract new residents; this embraces all aspects of the infrastructure including efficient public transport and a wide range of types of dwellings as well as the need to encourage and stimulate dynamic research environments and creative meeting places.

The interfaces between ESS and MAX IV and the regional economy will not be limited to construction, operation and future use, but also to the potential for innovation and the developments that follow. To be a good, attractive and interesting host for new activities and ideas, it is necessary to create a dynamic environment for innovation in close proximity to the facilities.

### Upgrade the housing market

Although ESS and MAX IV will both directly and indirectly lead to an increase in the number of residents in Skåne, it is unlikely that those who come to work within the facilities will have any significant

effects on the regional housing market. What can be of great importance from a regional planning perspective are the people and businesses that come here as an indirect effect of the facilities. Typical examples are students and people who work in the businesses that are being established or growing because of the research facilities. These include public sector organisations as well as private services and manufacturing industries.

Although the initial increase in demand for dwellings will primarily be seen in the Lund and Malmö areas, in the long term, there is very good potential for this demand to spread to other areas of Skåne. However this will be dependent on the availability and, in particular, the efficiency of public transport throughout the region. For people who wish to choose the location of their home based on where they want to live rather than where they work, an important factor is accessibility. Today, the majority of people tend to see the most attractive locations as those that are in dense urban environments with high accessibility to jobs, services and culture. The message here is clear, it is not just a matter of building, it is important to build the right type of housing in the right places. A well-functioning housing market is essential for both the region's growth and its ability to benefit from ESS and MAX IV. If the region is to compete for a qualified workforce on the international market the housing market must become more efficient and flexible.

### Public transport – a regional engine

All the municipalities in Skåne will have the opportunity to benefit in some form or other from spin-off effects from the new research facilities; these can be anything from an influx of residents and new start-ups to a general boost in tourism. A prerequisite for exploiting these opportuni-

ties is to create attractive and dynamic environments throughout the region by making sure that the urban environments close to bus and train stations are user friendly. Because meeting places frequently grow and flourish close to transport routes, public transport hubs are excellent locations for establishing workplaces, dwellings, centres of commerce etc. In order to encourage and promote development in the whole of Skåne it is in these hubs that innovative entrepreneur cafes and business incubators should be established and integrated. It is also necessary to develop public transport so that both Skåne and Blekinge are linked by a comprehensive, efficient and effective network with northeast Lund, ESS and MAX IV. There is therefore an urgent need for a comprehensive investment in public transport in the region with a measure of innovation; super buses on highway E22 and trams in Lund would be good examples.

### A region that attracts

The establishment of the ESS and MAX IV facilities will lead to an increase in the international workforce in the region. If, in the face of stiff global competition, the region is to attract the best in their respective fields it is essential that a smooth, easily understood and first-class reception process for both individuals and companies is established. Necessary information must be clear, readily available and gathered under one roof.

The web portal [www.movingtosouthernsweden.com](http://www.movingtosouthernsweden.com) has been developed by TITA as a first step in that direction; however TITA also sees a need to further develop this service to include an organisation for relocation support.

In order to attract the international target group that is expected as a result of ESS and MAX IV, it is important to ensure that international schools are available. Being prepared to meet the demand for



PHOTO: LASSE DAVIDSSON





international schools is more than a matter of matching demand with supply; it also requires deeper inter-municipal collaboration. It is also important that the schools maintain a high level of education if they are to compete with other regions.

### **A registry over available land**

A shared regional land registry of available building plots would simplify the marketing of Skåne and its municipalities at local, regional, national and international levels. The digital, web-based, interactive land registry, Markregister Syd, which has been developed by TITA, has the potential to be an efficient marketing tool for Skåne and Blekinge in their efforts to attract new businesses to the region. Markregister Syd can help to make vacant plots of land visible and facilitate contacts between companies, individuals and municipalities.

### **Next – a virtual community**

The data and knowhow that has been gathered by TITA must continue to be readily available to the region's stakeholders and used as a cornerstone in ensuing discussion. If this expertise is to be maximised

a forum with a clear structure must be organised – it should be said that steps have already been taken to establish a network based on discussions and transparency and a prototype, a virtual community, Next, has been developed within TITA. Next makes it possible to store and search for information and material related to the region and ESS and MAX IV in a common database. Next has the potential to become a platform for interactive discussions about everything that is happening in the region and be useful to local, national and more distant stakeholders.

### **An open innovation arena in materials science**

By 2019, both ESS and MAX IV will be up and running and the Öresund Region will be on the threshold of being the most advanced materials science centre in the world. If the potential is exploited correctly, the two research facilities can become the driving force that makes the Öresund Region Europe's most innovative region; to make this happen, the surrounding environment must be seen to be innovative and an open innovation arena is one way of achieving this. This is an arena where various and diverse stakeholders can collaborate in their efforts to solve future societal issues related to materials science; the arena must be international, neutral and all-encompassing. Only then can it become a vibrant and important complement to the research facilities where problems that are unlikely to be solved by a single player are highlighted. The arena's purpose and advantage is that it will be an independent catalyst that encourages collective action and innovative thinking. The arena is needed if the region is to be a good host for the facilities as well as highlight opportunities for innovative ideas and new businesses.

### **Dynamic research environments and meeting places**

There is a clear need to create places where science and society and scientific disciplines can meet. Not only are these venues frequently the birthplace of new thoughts and ideas, they are also a prerequisite if the research facilities are to be integrated with the surrounding community. If the environments and neighbourhoods that surround the facilities are attractive they are more likely to attract research-intensive businesses and institutions to the area; factors that are important elements for a dynamic research environment. The creation of meeting places means highlighting and protecting those aspects of the environment which visiting researchers, overseas employees and visitors see as attractive. It is important to preserve the region's uniqueness. The close proximity to green areas for recreation, games, sports and meetings can be relaxing and motivating and thereby help

create greater efficiency and stimulate innovative research. One has to imagine what the visiting scientists are looking or hoping for. The importance of affordable, shared and accessible services that have generous opening hours close to ESS and MAX IV cannot be overemphasised.

### **Regional mobilisation – critical to success**

Experience from other facilities and TITA's analysis clearly underline the need for regional cooperation if the facilities are to have a meaningful and lasting societal impact. As stakeholders in the region have shown unprecedented commitment at an early stage when compared to regions close to other research facilities the region is in a unique position. The task now is to maintain the cross-sectorial approach for collaboration that has been created. Such mobilisation does not happen by itself, it must be planned, funded and communicated.



## Skåne – the place to be

**T**he establishment of ESS and MAX IV can help to put Skåne on the world map. But if southern Sweden is to be known as a knowledge region offering unique opportunities for businesses and people, the story of the region must be told decisively and continuously using international, national and regional forums. TITA's international case studies show that many facilities and regions in other parts of the world initially underestimated the importance and complexity of working with communications and regional branding.

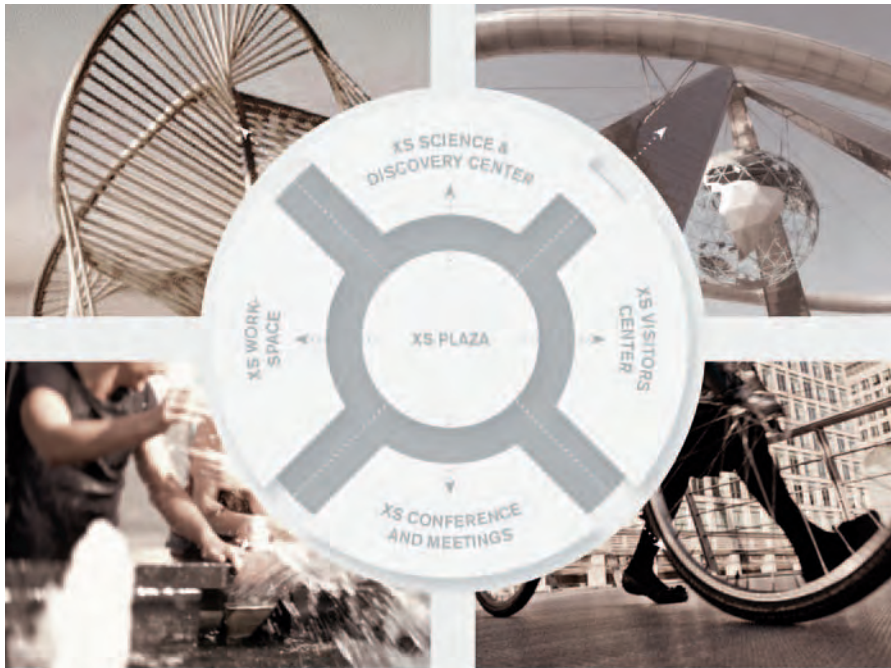
The region and Sweden must grasp the opportunity to do something completely new. Using TITA as starting point, the regional stakeholders can start from scratch and create a responsive environment around the facilities and thereby open the doors to a new way of integrating them with society as well as educational institutions and industry. At a number of new synchrotron radiation facilities it is this approach that has had the greatest impact. ESS and MAX IV should not just follow a trend they should also play a leading role and take it a step further.

### **A society for science**

A guiding principle in the work of creating a region that can capture the spin-off effects of ESS and MAX IV is to adhere to the vision 'Society for Science – Science for Society'. By this it is meant that society must create favourable conditions for research and exploit the potential the facility creates in the region, and, in return, scientists have a responsibility to carry out research that has a practical purpose and use that knowledge to help make the world a better place – not just understand it.







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## An international meeting place

In parallel with the construction of ESS and MAX IV there is the potential to create a meeting place of international significance – a place where society and science can meet for discussions and the exchange of knowledge. Approximately 3.7 million people live within a one-hour car journey of the facilities; this in combination with an increasing global trend in knowledge tourism create a huge opportunity to create a

world-class science centre between ESS and MAX IV. With the right investments, financiers and co-partners, this science centre, with the proposed name XS (EXESS), will have a very important role to play in the realisation of the vision 'Society for Science - Science for Society'. This is an historic opportunity to put the south of Sweden on the map as a knowledge region.



A VISION OF THE FUTURE. SCIENCE VILLAGE. ILLUSTRATION BY WHITE ARCHITECTS



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## Vision for the future: Skåne 2030

In the year 2030, the region around ESS and MAX IV is one of the most influential respected knowledge regions in the world; it enjoys research and educational excellence. One of the region's strengths is the diversity of venues and forums where science and society meet; this has led to an innovative social climate. With its competitive business community, well educated population, dynamic research environments, accessibility and attractiveness the region is internationally recognised for its successes. It is also renowned for its unique far-sightedness as

well as the innovative and practical methods of encouraging the various stakeholders and sectors of society to collaborate. Residents are proud that they play and have played a key role in this development and help spread the word about the opportunities and possibilities created by a dynamic society where people can live, study, work and run a business. This is an area where science and society work together to create new knowledge and economic growth, and advance the quality of life.

# The TITA strategies

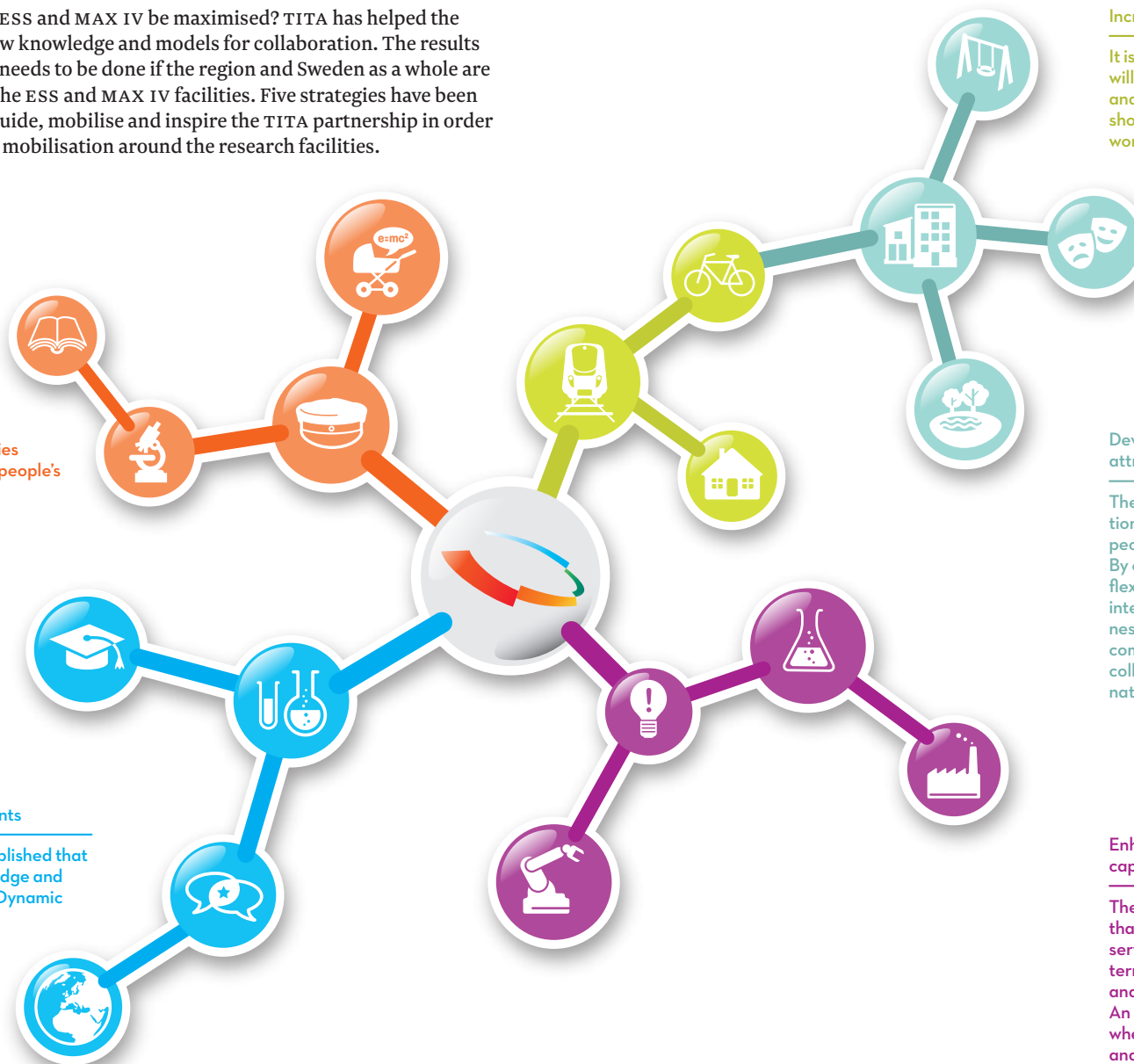
How can the societal benefits of ESS and MAX IV be maximised? TITA has helped the region's stakeholders acquire new knowledge and models for collaboration. The results of the project clearly show what needs to be done if the region and Sweden as a whole are to get the maximum benefits of the ESS and MAX IV facilities. Five strategies have been developed that are designed to guide, mobilise and inspire the TITA partnership in order to continue the work of regional mobilisation around the research facilities.

## Build a region strong in education

In order to establish a progressive and sound knowledge region, a long-term competence supply strategy should be developed around ESS and MAX IV; the strategy should also be integrated with the local universities and used to inspire and foster young people's interest in engineering and science education.

## Create dynamic research environments

A multitude of venues should be established that will facilitate the exchange of knowledge and ideas across traditional boundaries. Dynamic research environments will attract research-intensive businesses, external university campuses and high-tech companies and laboratories to the region.



## Increase accessibility throughout the region

It is important to prioritise spatial planning that will lead to improved accessibility both regionally and internationally. Modes of public transport should be planned with consideration to housing, workplaces, services and commerce so as to create attractive and easily accessible urban environments. Municipalities should work with other stakeholders to encourage the building of new dwellings especially rental units. Public transport should be developed so that the entire region has fast and easy access to ESS and MAX IV.

## Develop the international attractiveness of the region

The region should develop a world-class reception procedure for businesses, students and people who are coming to work in the region. By offering a professional welcoming service, flexible accommodation options, access to international schools etc. the region's attractiveness will be enhanced. To withstand global competition the regional stakeholders need to collaborate and thereby achieve a greater international appeal.

## Enhance the competitiveness and innovative capacity of the business sector

The region should develop support systems that increase regional business opportunities to serve, supply and use ESS and MAX IV. In the long-term, this implies strengthened competitiveness and also opens up new international markets. An open innovation arena in materials science where new ideas and businesses can germinate and grow will further enhance the region's competitive edge.



# The TITA project

The establishment of the research facilities ESS and MAX IV in Lund, in southern Sweden, is the single largest investment in research infrastructure in Swedish history. MAX IV is scheduled for completion in 2015 and ESS in 2019. Of the approximately SEK 18 billion that ESS and MAX IV will cost to build, Sweden will be responsible for approximately SEK 8 billion. In order to see how the societal benefits could be maximised and spin-off effects created by the facilities could be captured, a regional collaborative project was established. The project was given the name TITA, this is an acronym for the Swedish words for Growth and Innovation (TI) and Accessibility and Attractiveness (TA).

In autumn 2012 TITA delivered its findings and conclusions in a final report; this publication is a short version of the report.

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