Feasibility Study Regional Flagship Project

Preface

By developing our adaptability, we accelerate both our level of ambition and the pace of change going forward.

Sweden holds a prominent position as a nation of innovation. We lead numerous global rankings in areas such as welfare, technological development, innovation, education and gender equality. We are seen as collaborative, connected and able to think systemically. But an increasing number of countries are catching up with us and competition is becoming more intense. In the aftermath of the pandemic, many countries are mobilising and investing in the future. Sweden needs to do this as well.

Sweden's vision of becoming the world's first fossil-free welfare nation, and our goal of becoming the best in the world at utilising the opportunities of digitalisation, are two bright, guiding lights in this work. But we need to be even more ambitious. We need to increase our rate of investment, break down old structures and pave the way for new collaborations. One way to do this could be to mobilise around regional flagships.

In our view, it is now essential that we create regional capacity in order to mobilise the work of addressing future societal challenges, and it is this issue that motivated us to conduct this feasibility study project.

The global challenges of our time are major and complex. We need to transform our energy systems as well as our industrial base in order to guarantee the health and welfare of tomorrow and the food chains of the future. Not only this, we need to develop our cities for a sustainable lifestyle.

These are the focus areas of Sweden's upcoming innovation initiatives. They need to be backed up with investment in training and education, secure digitalisation and with supporting ecosystems from local to international level. Ecosystems exist to support companies in the start-up, growth and renewal phases as well as to strengthen the value chains in a particular industry or in a particular area of expertise.

Export, import, talent supply and investment promotion processes are merging as a result of this new business logic. The accelerating digitalisation of recent years has fundamentally changed the way we behave, how we move around and our view of the importance of physical location. We need to analyse and deal with this.

With this background in mind, discussions about regional flagships have been initiated around the country, but what exactly is a regional flagship and why are they important for our future development?

Regional flagships are important in that they enable us to accelerate the transition rate and to transform into a more sustainable society. They are also important because they are based on the premise that our behaviours need to change fundamentally. Regional flagships are necessary as a means for us to mobilise and address important societal challenges, where everyone contributes with a range of perspectives and where we endeavour to transform entire systems. Finally, they are important because they can determine a future vision, one which many people can support and contribute to, based on their circumstances.

In regional flagships – or joint resource mobilisations – we see an opportunity to channel our resources to meet contemporary societal challenges in our local environment and contribute on the global stage.

In our view, regional flagships can help us develop our capacity to lead change and adopt new solutions in our everyday lives. Distinct but interacting regional and national strategies are a prerequisite for ensuring progress in creating the conditions for a strategic systemic shift. We also believe that the collaboration that accompanies a large-scale transformation project improves our ability to manage major establishment opportunities. By training our adaptability, we can accelerate both our level of ambition and the pace of change going forward.

Lena Miranda, CEO
Linköping Science Park

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EXECUTIVE SUMMARY

During 2022/2023, Linköping Science Park has conducted a feasibility study project aimed at investigating what is required to enable more regional flagships and mobilisations in Sweden. The study has been conducted in collaboration with an Advisory Board consisting of representatives from regional authorities, municipalities, the public sector, regional innovation environments, the business community and civil society. The project also enlisted the help of a companion researcher from the Centre for Local Government Studies at Linköping University (CKS). The feasibility study has resulted in a framework upon which regional innovation ecosystems can be based when initiating and planning future regional flagships.

FRAMEWORK – A PATH TO REGIONAL FLAGSHIPS

In order for Sweden to be able to transition to a more sustainable society more rapidly, further initiatives aimed at systemic change are required, and regional flagships [1] are a typical example of initiatives like these. On the basis of the lessons learned from major joint resource mobilisations in Skellefteå and the rest of Europe, the project has developed a framework to support the initiation and management of regional flagships. The purpose of the framework, entitled "A Path to Regional Flagships", is to support stakeholder groups when they pool their resources, and to strengthen the conditions for carrying out system-transforming initiatives. The framework has been packaged into a model (see Figure 1) that describes the prerequisites that facilitate the development of regional flagships. These prerequisites are an indication of the complexity of initiating a regional flagship, as a substantial proportion of the regional innovation ecosystem needs to be involved and mobilised. The framework has been designed to enable municipalities, regional authorities and the business community, as key actors in a regional flagship, to assess their own ability and capacity to run a regional flagship successfully.

The framework has been arranged into three different layers, with the outermost circle clarifying the prerequisites for a regional authority or municipality in terms of identified directions (development plans, visions, etc.) and comparative advantages. The two inner circles clarify the system perspective that the key actors should base their work on, as well as the enabling approaches that are needed to achieve large-scale change and system innovation.
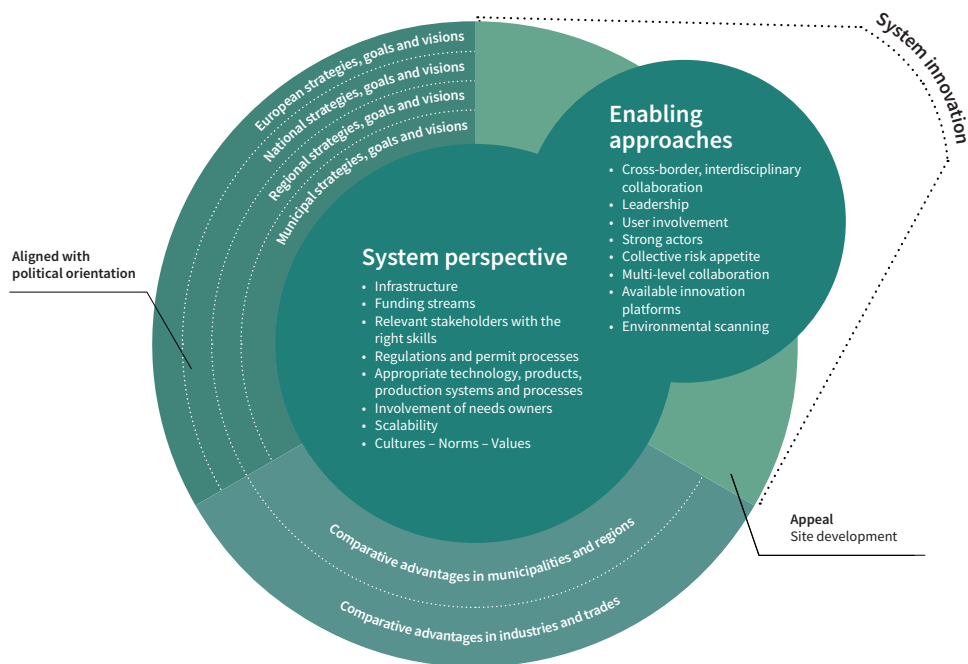
SEQ Figure * ARABIC 1 Framework – A Path to Regional Flagships

[1] A regional flagship contributes to finding solutions to our shared societal challenges by approaching them in an innovative and system-transforming manner. The aim is to bring about transformative change that takes into account a wide range of perspectives and ultimately creates value for society.

Study visit to Amsterdam

The different parts of the framework are summarised below:

1. In order to ensure that regional authorities or municipalities have the capacity to scale up an initiative into a regional flagship, the initiative should be aligned with **political directions** (at different levels in society) as this creates the conditions for the initiative to be prioritised by decision-makers, which in turn can facilitate funding and joint resource mobilisation. If the initiative is to become a flagship and enable scale-up, its starting point should be based in the **comparative advantages** of a region or municipality, or of a specific industry or sector. The region should also have strong appeal or a plan for how its appeal can be enhanced. This is because a regional flagship requires that businesses will want to operate in an area and local residents will want to live there.

2. It is necessary for the key actors in regions or municipalities to apply a **systems perspective**. This involves analysing issues, challenges and solutions within the framework of the system in which the challenge exists. Rather than focusing solely on a single aspect of an issue or opportunity, key actors should consider the various components, stakeholders and processes that interact within the system. There needs to be an understanding that several systems may be required to interact in order for it to be possible to scale up an initiative. A number of aspects need to be taken into consideration, for example whether there is efficient infrastructure, what funding streams exist, which regulations apply and whether these need to be developed to have an impact. This requires the commitment of relevant stakeholders with the right skills and the involvement of needs owners.

In addition, it is important that there is some concept of how to encourage the acceptance and adoption capacity of the local community. This can involve working to influence prevailing norms and values in order to promote a desired change, and includes an awareness of these prevailing norms and values.

3. Finally, the initiative should be developed on a basis of **enabling approaches** that can create momentum in the process, for example cross-border, interdisciplinary collaboration and user involvement. It is also crucial to have a designated leadership that includes strong actors.

Above all, there are three main stakeholder groups that can utilise the framework:

*   Key actors such as regional authorities, municipalities and the business community can use the framework to understand how to strengthen the conditions for running a regional flagship in a particular geographical area.

*   The owners of a project or initiative can apply the framework to assess whether the necessary conditions to run a regional flagship are present in the region.

*   Based on the framework, funders can analyse future or ongoing projects based on their prerequisites for success.

SUMMARY OF CONCLUSIONS

After an extensive journey that included study visits, framework development and testing with regional authorities and the business community, the following conclusions have been drawn:

- The framework fills a void and can serve as a basis for the next step towards system innovation

- Regional authorities and municipalities are key actors in driving system innovation.

- The government needs to create financial conditions that will enable long-term investments

- There are challenging structures that require courageous leaders that dare to drive change

- There are challenges in the current funding system in terms of scaling regional initiatives

- Regional flagships can create the conditions for growth and large-scale change

- The design-driven process has been a success factor in developing the framework

SUMMARY OF RECOMMENDATIONS

The contents of the framework indicate important capabilities, prerequisites and approaches in order to succeed with system innovation. The framework is not an all-inclusive solution, but can be used to advantage as a starting point to create direction and an understanding of the necessary capacity building. We provide six recommendations for operating regional flagships using the contents of the framework as a basis.

- Administer and promote usage of the framework

- Use the framework to identify priority areas for capacity building

- Create the conditions for initiating regional flagships with funding and capacity building

- Task the authorities with co-ordinating efforts that provide synergies at several levels

- Rethink the distribution of regional growth funds (1:1)

- Initiate further analysis

1. INTRODUCTION

1.1 The feasibility study examines what is required to enable more regional flagships and mobilisations

During 2022/2023, Linköping Science Park has conducted a feasibility study project aimed at investigating what is required to enable more regional flagships and joint resource mobilisations in Sweden.

The feasibility study has been conducted in collaboration with an Advisory Board consisting of representatives from regions, municipalities, the public sector, regional innovation environments, the business community and civil society. Three science parks from other parts of the country were invited to participate to ensure nationwide representation. The project also enlisted the help of a companion researcher from the Centre for Local Government Studies at Linköping University (CKS). The study is primarily based on material gathered during field studies and workshops, and using input from relevant experts in a number of themes, after which it was primarily discussed and iterated with the project's Advisory Board.

The feasibility study has resulted in a framework on which regional innovation ecosystems can be based when initiating and planning future regional flagships. It defines what a regional flagship is and how it can be equipped to drive innovation, transformation and regional growth.

Because the goal of regional flagships is system innovation, i.e. pervasive transformation or societal change, behavioural changes, cross-disciplinary collaboration, regulatory innovation and multi-level governance are important parameters in the work.

The feasibility study has analysed the following issues:

1. What is the definition of a regional flagship?

2. What are the prerequisites for enabling more regional flagships in Sweden and increasing our capacity for large-scale transformative change in the long term?

Regional flagships bring about transformative societal change. Within the scope of this feasibility study, we have defined the flagship concept as follows: A regional flagship contributes to finding solutions to our shared societal challenges by approaching them in an innovative and system-transforming manner. The aim is to bring about transformative change that takes into account a wide range of perspectives and ultimately creates value for society.

Creative discussions between Niklas Tideklev, Region Östergötland and Anna-Carin Ramsten Vinnova during a reference group meeting.

1.2 Background to the feasibility study

To begin with, we should place the "Feasibility Study for Regional Flagships" in its broader political and economic context. A relevant basis for this is the launch of the EU's "European Green Deal" (EC 2019), which has come to represent the overall framework for EU growth and cohesion policies during the current programme period, 2021 to 2027. The European Green Deal can be described as an integrated sustainability and growth strategy that focuses on achieving climate neutrality by 2050. In concrete figures, the strategy aims to reduce emissions by 55 percent by 2030 and achieve zero emissions by 2050. The European Green Deal can be regarded as a strategy for green growth, i.e. achieving growth and ecological sustainability simultaneously. It can be interpreted as a vision that integrates industrial policy and geopolitics – with climate neutrality as a basis. Via the Green Deal, aims have been formulated to develop the EU's global competitiveness by prioritising sustainability issues. The concept of the "Green Deal" can be defined as an agreement and a social contract involving key stakeholders in different sectors of society (public, private and civil). Its impact in the EU has been significant and can be described as part of an identity: "To be European is to be carbon neutral" (Lee-Makiyama 2021, p. 4).

The European Green Deal includes a number of measures such as the industrial strategy, which will likely have a crucial impact on how the structure of industry develops within the EU. Implementation of the Green Deal is underpinned by regulations, action plans and fiscal policy measures, while implementation of the Green Deal's goals requires the development and introduction of new technology, which in turn requires financial resources. In other words, implementation of the Green Deal implies major financial investments and the development of a regulatory and management system that enables financial investments with long time horizons. It is precisely the issue of access to investment that poses a fundamental challenge to implementing an industrial transformation on this scale (Lee-Makiyama 2021).

The regions stand at the centre of implementation of the EU's development policy. Thus, questions about the regions' capacity to put the Green Deal into practice finish high on the agenda. This is not only a matter of financial capacity, but also a question of the capacity to lead and drive societal transformation via collaboration. This includes the ability "to co-ordinate stakeholders and efforts over periods of time". The time issue is important in this context as the efforts that need to be conducted in the present will have impacts in the longer term (Lee-Makiyama 2021).

The overall framework of the European Green Deal has been concretised for its implementation in a large number of models, strategies and efforts. "Flagship" is a concept in this context – and a key term in the title of the project we are describing in this report: "Feasibility Study Regional Flagships". To illustrate how flagships are used, the EU's Innovation Agenda (EC 2022) can serve as an important example. Through this strategy, a number of overarching priorities have been formulated under the designation "flagship areas". These priorities concern funding, creating test beds, spreading innovation efforts to a large number of regions, strengthening the supply of skills and increasing policy support for innovation. The term flagship is also used within the EU to describe more concrete efforts characterised as "long-term and large-scale research initiatives driven by an ambitious vision". These are initiatives that are expected to "bring positive changes that benefit society and the economy, and advance EU leadership in technology and industry [globally]". Flagships | Shaping Europe's digital future (europa.eu).

The aim of the Feasibility Study Regional Flagships project was to explore flagships from a Swedish perspective, which partly involved participating in processes for major investments in industry in northern Sweden. These are comparable to flagships, with clear links to political and economic initiatives that align with the EU Green Deal and include targets for reducing carbon dioxide emissions. When Sweden took over the Presidency of the Council of the European Union in January 2023, it was decided to organise meetings in Kiruna in northern Sweden. The initiatives in Kiruna were presented to visiting EU representatives as showcases – or flagships – for industrial ventures that align with the Green Deal: "Becoming a role model as a country of establishment is in the national interest" (Larsson 2022).

Naturally, Sweden is part of the EU Green Deal agreement and to facilitate the extensive industrial projects in northern Sweden, the government appointed a national co-ordinator.

The co-ordinator Peter Larsson's final report (2022) describes important lessons learned from the mission to "advance the co-ordination of work with efforts of significance for large business establishments and business expansions in Norrbotten and Västerbotten counties" (Larsson 2022, p.2) that are transferable to other regions in Sweden. Peter Larsson highlights the various challenges involved in carrying out such large-scale investments for industrial projects.

Some of these challenges are particularly related to the geography of northern Sweden with its small population and long distances, but there are also generic challenges in a national context such as the shortage of skills. Hence the far-reaching decentralisation in Sweden to regions and municipalities is an important framework. This partly includes the recent decentralisation of regional development responsibility to the regional authorities, and partly the long-standing extensive decentralisation of numerous essential societal functions to the municipalities. The latter includes physical planning and infrastructure as well as training and education. Furthermore, municipal companies have been established over time in industries such as energy production, real estate, ports and airports. These have become key actors in terms of the capacity to transform and develop local society. One argument in the report (Larsson, 2022) is that extensive decentralisation of public sector tasks, combined with a lack of co-ordination between stakeholders, risks hampering the rapid efforts that are expected in conjunction with large-scale industrial investment projects. It is also important to note that certain crucial societal functions remain under centralised control, for example universities and colleges as well as national infrastructure. Furthermore, national legislation

prevails over regional authority. In northern Sweden, the issue of migration is significant due to the demand for migrant workers if an expanded industrial base is to recruit labour.

The national co-ordinator's report (Larsson 2022) also raised the issue of investments, which we described above as a fundamental challenge for the entire European Green Deal. Due to the way that the Swedish planning system is designed, it is the municipalities that need to make major investments in the event of rapid local community expansion (as a result of large industrial establishments). Such investments can be described as "Investment in future tax strength" (Larsson 2022). Even if the municipalities have the capacity to fund the necessary built environment projects, which can also vary depending on the economic situation, it still begs the question as to what local politicians will decide when it comes to balancing risk with the perceived benefits of achieving local political agendas.

To conclude, in our view the processes associated with flagship initiatives related to the implementation of the European Green Deal lead to numerous questions and the launch of new models and approaches such as PRI, Partnerships for Regional Innovation (EU Commission).

2. METHOD AND ORGANISATION OF THE FEASIBILITY STUDY

Linköping Science Park is leading the feasibility study project based on horizontal and sector-wide exchanges of experience, as the project has appointed an Advisory Board consisting of representatives from different societal sectors such as regional authorities, municipalities, the public sector, regional innovation environments, science parks, the business community and civil society. Within the scope of the feasibility study, the project has also collaborated with a companion researcher and several other related projects.

Project implementation has been based on the Double Diamond design process method and model implementation. In a design process, the solution is not immediately obvious and much of the work focuses on building understanding, questioning, and continuously iterating ideas and prototypes. The first diamond focuses on defining the challenge, while the purpose of the second is to develop and test possible solutions. This is in order not to land on a solution before needs have been analysed and there is consensus on them.

2.1 Linköping Science Park is leading the study in close collaboration with an Advisory Board and a companion researcher

Linköping Science Park is leading the work of the feasibility study and has appointed a national Advisory Board with the aim of ensuring that the method and process is suitable for more regional contexts if and when the project has the conditions for a scale-up.

IMPLEMENTATION HAS BEEN CHARACTERISED BY HORIZONTAL AND CROSS-SECTORAL EXCHANGES OF EXPERIENCE

The Advisory Board consists of representatives from different societal sectors such as regional authorities, municipalities, the public sector, regional innovation environments, science parks, the business community and civil society. For a complete list of members, see Appendix 4.

The composition of the Advisory Board represents several parts of the country, which furthers the goal of enabling every part of Sweden to contribute to the continued development of the country as a prominent innovation nation. The Advisory Board was appointed with the understanding that adaptation, transformation and innovation should not only take place in the larger cities, but across the rest of the country as well. This applies both in the business community and in the public sector, regardless of the size of the organisation.

The project has endeavoured for national spread, which led to representatives from Västernorrland, Dalarna and Kalmar participating on the Advisory Board.

Ramboll was procured for process support for the duration of the project and has assisted with several different stages, including:

- developing the project method in collaboration with Linköping Science Park
- facilitating workshops and meetings with the Advisory Board
- planning and organising study trips
- supporting Linköping Science Park in the production of the feasibility study report

THE PROJECT IS COLLABORATING WITH A COMPANION RESEARCHER AND WITH OTHER SIMILAR PROJECTS

The study project enlisted the help of a companion researcher from the Centre for Local Government Studies at Linköping University (CKS), whose main task has been to track the development of the

transition in Upper Norrland and bring knowledge and experience to the process of equipping regional flagships.

This has taken place against the backdrop of the extensive experience and insights that can be drawn from developments in northern Sweden, from which Sweden can benefit greatly when we jointly explore more ways forward in the creation of a Swedish model for transition and establishment in order to exploit future growth opportunities.

Our project has also collaborated closely with other projects and similar initiatives within the scope of the feasibility study. For example, we have collaborated with "SKISS", a project owned and led by Region Östergötland that aims to build structures, skills and capacity in smart specialisation in broad collaboration with the innovative environments that currently exist in the region. Within the framework of the SKISS project, Region Östergötland has, for example, developed a regional process whose goal is to evaluate and launch one or more regional flagships.

Linköping Science Park has been a key actor in Region Östergötland's SKISS project and in our view this feasibility study will serve as an important basis for Region Östergötland and other stakeholders in the region.

2.2 The project has been conducted in four phases based on a design process model

The project has been conducted on the basis of the Double Diamond design process method and model (Figure 1).

In a design process, the solution is not immediately obvious and much of the work focuses on building understanding, questioning, and continuously iterating ideas and prototypes. The first diamond focuses on defining the challenge, whilst the purpose of the second is to develop and test possible solutions. This is in order not to land on a solution before the needs have been analysed and there is consensus on them.
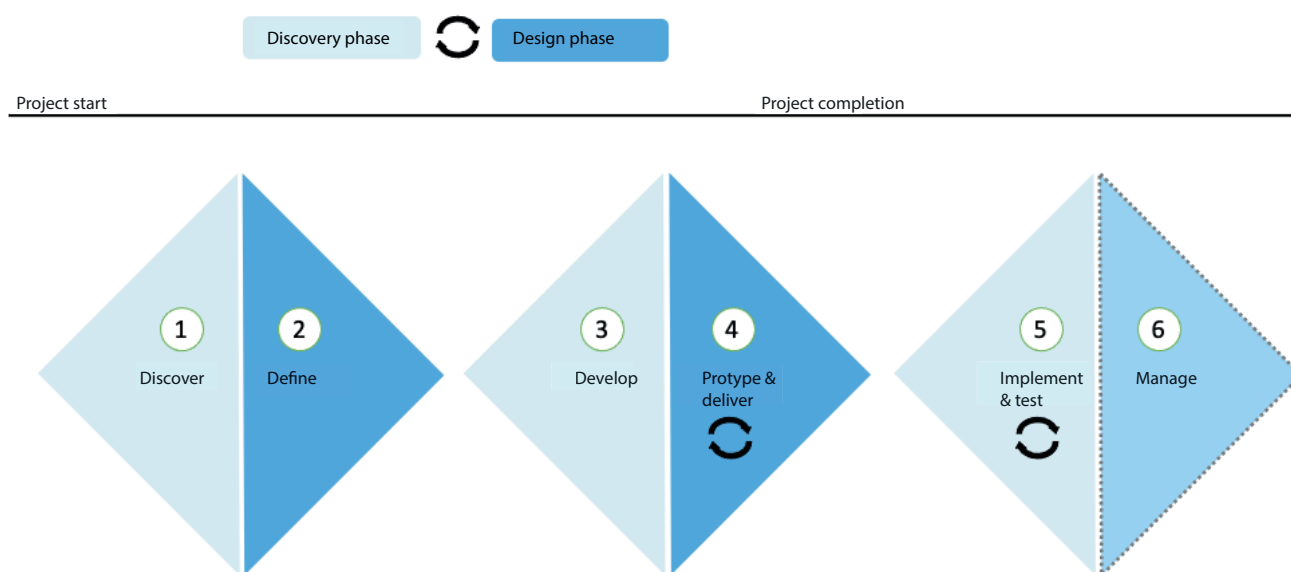
Figure 1. Illustration of the project's approach and method

In order to tackle the issue of which prerequisites are required to enable more large-scale transformation projects and flagships in Sweden, the project has been conducted in four phases, as described below.

The first phase was a discovery phase that focused on gathering data and exploring and understanding the needs, drivers and prerequisites related to what a regional flagship is, why it is needed and how it can develop stakeholder adaptability. The data collection consisted of questionnaires and interviews with the business community, the public sector, civil society and academia. We also conducted a mapping study of projects and initiatives that could potentially be considered regional flagships. In addition, the Advisory Board invited individuals to try and define and propose regional flagships themselves. Finally, the project conducted two field studies, one national and one international.

The field studies were carried out in Skellefteå, Amsterdam, Rotterdam and Leuven.

The second phase focused on defining, analysing and summarising results, lessons learned and insights from the collected data in order to define and understand the needs, driving forces and prerequisites for regional flagships, what they are and how they can contribute to societal transformation. The material was presented and primarily iterated with the project's Advisory Board. The analysis consisted of clustering survey and interview responses, and packaging the lessons learned and results of the two field studies in order to understand patterns of significance in terms of needs, driving forces and prerequisites for regional flagships.

The third phase developed concepts and proposals to meet the needs and create enabling structures in systems as well as for stakeholders. We investigated what is required for a framework to become a reality and contribute to achieving the purpose of the project. Framework – A Path to Regional Flagships was developed based on the results, lessons learned and conclusions from the data collection in the initial phases. In the third phase, the framework was tested by strategists at Region Östergötland in projects that they felt might meet the criteria for what a regional flagship is. The project concept that was tested is known as "Circular Resource Mobilisation", and is the region's first initiative for a regional flagship.

The fourth phase developed and tested the framework in order to bring in more insights and perspectives on its usability, purpose and the needs it fulfils. This partly took place in a round of consecutive iterative processes with the Advisory Board, and was shared with stakeholders outside the project such as the national co-ordinator for northern Sweden, and to some extent with the former chairman of the Committee for Technological Innovation and Ethics (KOMET). In a second round of iteration and protyping, additional projects and regions were added to the process to achieve deeper iteration. These consisted of the "Juridiska förutsättningar för insektproduktion i Sverige och Norge" (Legal Prerequisites for Insect Production in Sweden and Norway) project in Region Dalarna and the eHealth Arena project in Region Kalmar. Region Västernorrland also contributed to the process by testing the framework with two planned initiatives in their region.

An additional project in Linköping tested and used the framework, Testarena Trygghetsskapande Teknologier (Test Bed for Safety-creating Technologies), managed by Linköping Science Park. The framework has also been presented and iterated with the Transformation Office in Skellefteå, during which both Skellefteå Municipality and Region Västerbotten region participated.

2.3 Field studies to examine lessons lear-
ned from major establishments

The project conducted two field studies, one in Skellefteå and one in Amsterdam, Rotterdam and Leuven. The purpose of the field studies was to examine lessons learned from operating large establishments. In the following sections, we explain why these were selected.

SKELLEFTEÅ – ONE OF SWEDEN'S LARGEST SOCIETAL SYSTEM INNOVATION PROJECTS – A POTENTIAL MOBILISATION MODEL

Skellefteå was seen as a natural choice for a field study from a national perspective because the ongoing development in Upper Norrland is one of the largest societal projects in modern times in Sweden. In around 2012, Skellefteå Municipality initiated a transformation journey with the goal of reversing the trend of depopulation and reduced economic development. By mobilising the local community, the business community and the surrounding area, Skellefteå identified and implemented a series of initiatives in preparation for the future. During the work, the municipality identified, inter alia, that the availability of electricity might be an opportunity to attract energy-intensive businesses – and businesses that were willing to contribute to renewable energy transition and new industrialisation in line with the aims of northern Sweden and Skellefteå. When the municipality became aware of Northvolt's plans to establish in the region, they acted quickly and successfully to persuade the company to choose Skellefteå over several other competing locations. Since Northvolt established, growth in the area has accelerated. The business community is leading the commitment to transition to renewable energy in the form of electric, hydroelectric and solar power.

The planned investment in Norrbotten amounts to more than BSEK 1,000 and the planned population increase is 100,000 new residents in the coming decade.

Northvolt's planned expansion – and the tremendous growth potential that the new industrialisation in upper Norrland will bring – has united the municipality and the regional authority on issues related to sustainable development, built environment, welfare services, skills supply, energy storage, innovation and appeal, and jointly they have launched a series of new solutions. The planned growth will place high demands on housing construction, expansion of the transport network and welfare services. There is much to learn from Skellefteå and the ongoing process, which focuses on both growth and transformation.

From 29–31 August 2022, the project visited Skellefteå with the aim of learning lessons from Northvolt's establishment. The project met with representatives from the regional authority and the municipality as well as the business community and civil society.

AMSTERDAM, ROTTERDAM AND BRUSSELS ARE RUNNING LIGHTHOUSE PROJECTS WITH VALUABLE LESSONS LEARNED

After conducting an initial mapping of different
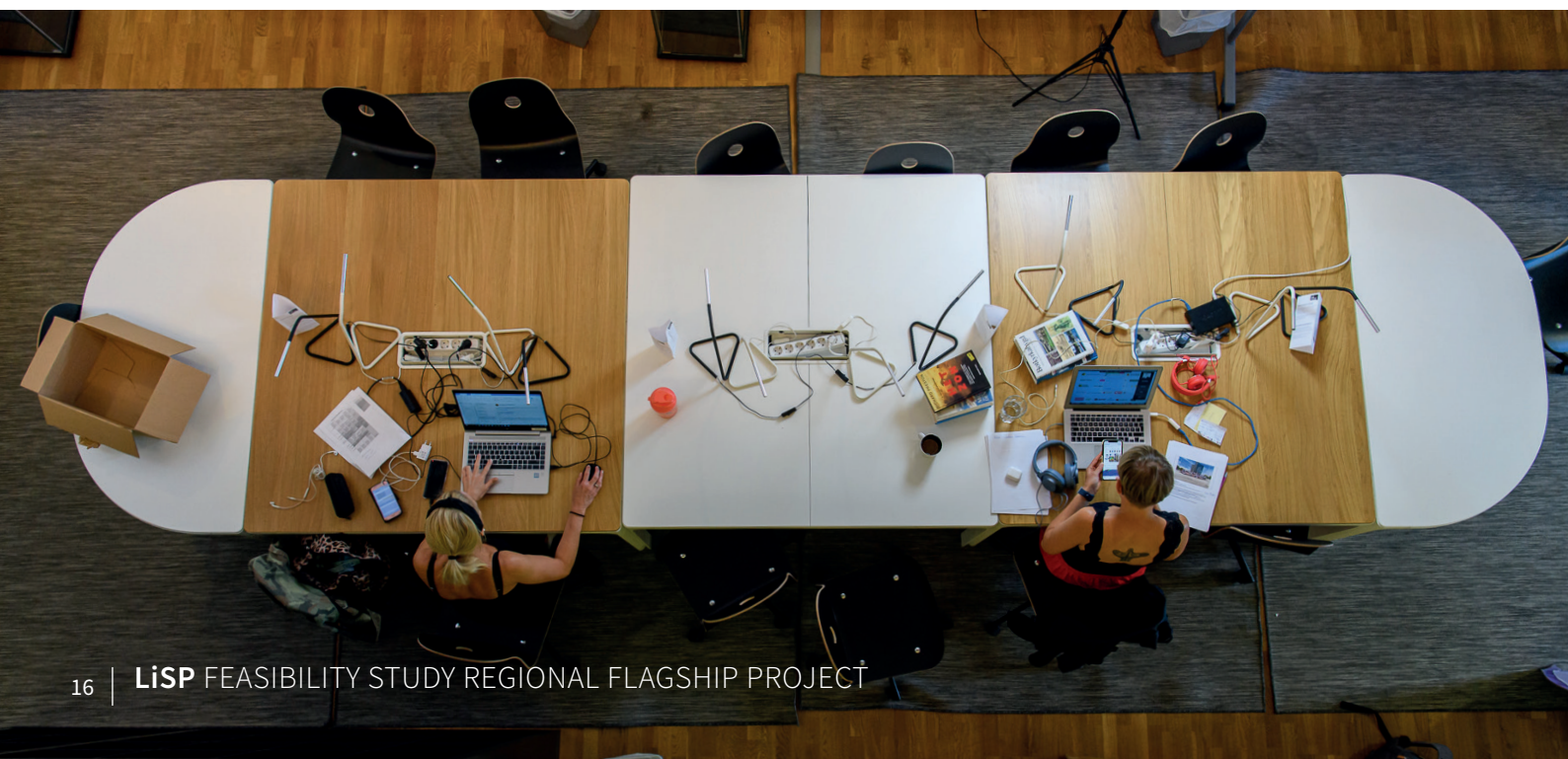
international projects, three European projects were selected for the field study. The choice of Europe was a natural one because the context of the discussion about regional flagships is European. The final choices were Amsterdam, Rotterdam and Leuven.

In addition, the project visited Brussels and the Key Digital Technologies – Joint Undertaking initiative to draw inspiration for a form of funding model for major joint resource mobilisations. All the cities and municipalities that the project visited have run so-called "lighthouse projects", which are EU-funded programmes for driving climate transition within the framework of the Smart City projects initiative. Leuven was also named European Capital of Innovation in 2020, and was therefore of particular interest to our project.

Within the framework of the field study, visits were made to the above-mentioned cities from 5 to 7 July 2022. The purpose of the study trip was to gain deeper knowledge of the European context and how cities/municipalities work to promote major transformation projects. Partly we wanted to understand the similarities with and the differences from the Swedish context, and partly to draw inspiration for the design of a future model in Sweden. We met representatives who were participating in the city authorities and municipalities' transformation journeys,

project managers in large-scale projects as well as funders of large-scale transformation projects and mobilisations. A complete list of the individuals we met during our study trips is available in Appendix 3.

In Rotterdam, we visited the RUGGEDISED project, a renovation of a run-down urban district under the catchphrase "Designing smart and resilient cities for all". In Amsterdam, we visited the ATELIER project, a smart city district with aims of becoming "citizen co-creation driven". Both projects had been initiated by the cities themselves (the equivalent of Swedish municipalities). In Leuven, we visited Leuven 2030, a multi-stakeholder initiative dedicated to accelerating the transition to a carbon-neutral, resilient Leuven based on research, but run with the city as a platform. All three projects had been allocated funds in the ECSEL open call for "Lighthouse Initiatives", whose main focus has been "Smart City" and climate transition. A commonality between all three projects is that they invested heavily in the joint resource mobilisation both prior to and during the projection of their applications, with the clear aim and goal of ensuring that their applications were granted. "We see the application as an investment", emphasised one of the representatives we met. She described how the city invested the equivalent of SEK 2.5 million in the projection work, which lasted for nine months.

3. FRAMEWORK – A PATH TO REGIONAL FLAGSHIPS

In order for Sweden to be able to transition to a more sustainable society more rapidly, further initiatives aimed at systemic change are required, and regional flagships [2] are a typical example of initiatives like these. On the basis of lessons learned from major joint resource mobilisations in Skellefteå and the rest of Europe, the project has developed a framework to support the initiation and management of regional flagships.

The purpose of the framework is to provide support for groups of key actors when they pool their resources and to strengthen the conditions for carrying out system-transforming initiatives.

In the following chapter, we describe why a framework for regional flagships is needed, how it has been developed and designed, and who can make use of it.

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[2] A regional flagship contributes to finding solutions to our shared societal challenges by approaching them in an innovative and system-transforming manner. The aim is to bring about transformative change that takes into account a wide range of perspectives and ultimately creates value for society.

Louise Felldin, Director of Economic Development, Linköping Municipality and Anna Björklou, CEO, Epishine

3.1 A framework for regional flagships to support the facilitation of system innovation

The societal challenges of today are both major and complex. This means that complex, complicated solutions are also required to respond to these societal challenges. It is in this context that we are talking about system innovation.

System innovation entails thinking above and beyond individual solutions to individual problems and examining the entire system in which the problem has occurred. This can involve examining factors such as structures, institutions, policies and technologies, and how these impact on each other and create societal systems. Identifying these factors and how they can be influenced facilitates the development of new system solutions that address societal issues in a fundamental way.

An example of system innovation is the transition from traditional landline telephony to mobile telephony and internet-based communication. This shift represented a radical change in the way people communicated and interacted, which also impacted infrastructure, the technology industry, business models and regulations. The results of system innovation can, for example, mean that society changes and that the new norm becomes circular business models that utilise every part of a product's life cycle and new energy systems that are sustainable and decentralised. It can also lead to us transporting ourselves in new ways that reduce carbon dioxide emissions and improve accessibility

for everyone. System innovation is an important approach to dealing with major and complex societal issues in an effective way with sustainability as a goal.

In order for societal stakeholders to be able to work with system innovation, they need to increase their knowledge as well as their methods of doing so. A framework that describes the prerequisites for working with system innovation can be a first step.

In order to achieve systemic change, societal stakeholders need to tackle challenges from a systems perspective. A systems perspective means considering a situation, issue or phenomenon as a whole in which the different parts interact and influence each other. Understanding the system itself is necessary but not sufficient. Additional knowledge of relevant solutions to a societal challenge and enabling approaches are also needed. It is a matter of, for example, creating processes and methods that enable societal stakeholders with diverse perspectives to join forces and collaborate.

In our estimation, the framework can serve to support and facilitate regional innovation ecosystems in establishing future flagships by highlighting key factors for initiating and scaling up flagships. This can contribute to the regional authorities better equipped to run regional flagships efficiently.

3.2 What is the framework, how can it be used and by whom?

The framework, which is entitled "A Path to Regional Flagships", is formulated on the basis of data that has been collected as part of this feasibility study. The framework is largely based on lessons learned from major establishments that were gathered during the study visits to Skellefteå and other parts of Europe (see Chapter 4) and via exchanges of experience in the reference group. We have also drawn inspiration from Miedzinski (2017), who developed "A framework for mission-oriented innovation policy roadmapping for the SDGs: The case of plastic-free oceans". In addition, we have received input from Peter Larsson, the Swedish government's national co-ordinator for northern Sweden, Jon Simonsson, the former chairman of the Committee for Technological Innovation and Ethics (KOMET), and employees at the Transformation Office in Skellefteå.

The purpose of the framework is to provide support for groups of key actors when they pool their resources and to strengthen the conditions for carrying out system-transforming initiatives.

These stakeholders include municipalities, regional authorities and the business community. The framework can serve as a support for understanding what a regional flagship is and how stakeholders can contribute to scaling up a mobilisation, innovation or project.

The framework has been packaged into a model (see Figure 1) that describes the prerequisites that facilitate the development of regional flagships. The prerequisites are an indication of the complexity of initiating a regional flagship, as a substantial proportion of the regional innovation ecosystem needs to be involved and mobilised.

HOW SHOULD THE FRAMEWORK BE READ?

The framework describes the prerequisites that should be in place in order for regional authorities or municipalities to have the capacity to scale up a project or a mobilisation that can, in the long run, become a regional flagship which contributes to system innovation.

The framework has been arranged into three different layers, with the outermost circle clarifying the prerequisites for a regional authority or municipality in terms of identified directions (development plans, visions, etc.) and comparative advantages. The two inner circles clarify the system perspective that the key actors should base their work on, as well as the enabling approaches that are needed to achieve large-scale change and system innovation.
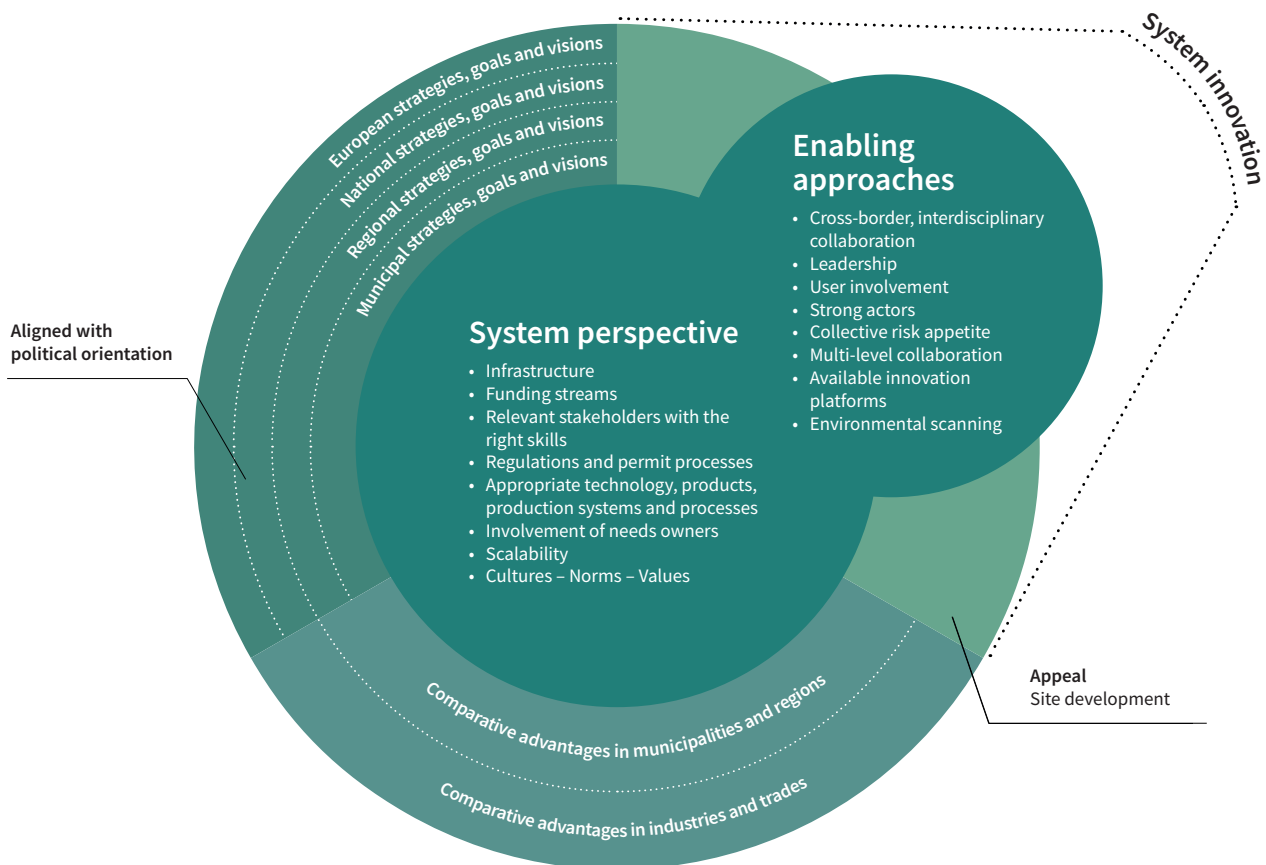
SEQ Figure * ARABIC 1 Framework – A Path to Regional Flagships

The different parts of the framework are summarised below:

1. In order to ensure that regional authorities or municipalities have the capacity to scale up an initiative into a regional flagship, the initiative should be aligned with political directions (at different levels in society) as this creates the conditions for the initiative to be prioritised by decision-makers, which in turn can facilitate funding and joint resource mobilisation. If the initiative is to become a flagship and enable scale-up, its starting point should be based in the comparative advantages of a region or municipality, or of a specific industry or sector. The region should also have strong appeal or a plan for how its appeal can be enhanced. This is because a regional flagship requires that businesses will want to operate in an area, and local residents will want to live there.

2. It is necessary for the key actors in regions or municipalities to apply a systems perspective. This involves analysing issues, challenges and solutions within the framework of the system in which the challenge exists. Rather than focusing solely on a single aspect of an issue or opportunity, key actors should consider the various components, stakeholders and processes that interact within the system. There needs to be an understanding that several systems may be required to interact in order for it to be possible to scale up an initiative. A number of aspects need to be taken into consideration, for example whether there is efficient infrastructure, what funding streams exist, which regulations apply and whether these need to be developed to have an impact. This requires the commitment of

relevant stakeholders with the right skills and the involvement of needs owners.

3. In addition, it is important that there is some idea of how to encourage the acceptance and adoption capacity of the local community. This can involve working to influence prevailing norms and values in order to promote a desired change, and includes an awareness of these prevailing norms and values.Finally, the initiative should be developed on a basis of enabling approaches that can create momentum in the process, for example cross-border, interdisciplinary collaboration and user involvement. It is also crucial to have a designated leadership that includes strong actors.

At the same time, we would like to emphasise that regional flagship sites do not necessarily have to meet all of these prerequisites to have the capacity to establish a regional flagship. However, if a region meets very few of them, it can be challenging to initiate a regional flagship that contributes to system

innovation. It is therefore desirable if regions and municipalities wishing to set up regional flagships work to ensure these prerequisites.

WHO CAN UTILISE THE FRAMEWORK?

In our estimation, there are above all three main stakeholder groups that can utilise the framework:

• Key actors such as regional authorities, municipalities and the business community can use the framework to understand how to strengthen the conditions for running a regional flagship in a particular geographical area.

• The owners of a project or initiative can apply the framework to assess whether the necessary conditions are present in the region to run a regional flagship.

• Based on the framework, funders can analyse future or ongoing projects based on their prerequisites for success.

3.3 The framework consists of preparatory questions and criteria

The framework comprises two different parts to enable stakeholders to utilise in practice:

1. Preparatory questions for regional authorities, municipalities and the business community can be used to strengthen their capacity and ability to run a regional flagship.

2. Criteria for self-evaluation and assessment of whether the conditions exist for a project to become a regional flagship.

PREPARATORY QUESTIONS FOR REGIONAL AUTHORITIES, MUNICIPALITIES AND THE BUSINESS COMMUNITY

Based on the visual model, we have developed preparatory questions for regional authorities, municipalities and the business community. In order for a project, a concept, a joint resource mobilisation or an initiative to become a regional flagship, stakeholders need the capacity and the skills to run a regional flagship. For this reason, there may be a need for the stakeholders themselves to reflect on their own knowledge, organisation and conditions for running system transformation projects – both in terms of implementation capacity and, above all, how well prepared they are to receive the results and how new solutions can be implemented and scaled up in their own operations.

Moreover, different actor groups such as regional authorities, municipalities or the business community can ask themselves these questions before a concept or a project even exists, thereby gaining an idea of whether they possess the capacity to run a regional flagship, or whether they need to develop individual skills. The preparatory questions concern, for example, whether there is a broad political majority in the region/municipality in support of a regional flagship, whether there are evident comparative advantages in the region, and whether there are established structures that facilitate stakeholder collaboration. A list of preparatory questions, sorted on the basis of the actor group they are intended for, can be found in Appendix 2.

CRITERIA FOR SELF-EVALUATION AND ASSESSMENT

The final element of the framework comprises criteria that can be used by a regional authority, municipality, project owner or funder to investigate whether the necessary prerequisites for upscaling a project or concept into a regional flagship exist. The criteria are categorized on the basis of the framework elements – **systems perspective, regional conditions and enabling approaches** – and can be found in Appendix 2. For each criterion there is a question that can be used by a region, a project owner or a funder to assess how well a prerequisite is being met. The question can be used for self-evaluation by a project owner or as an assessment tool by a funder. The questions can either be asked at the start of a project or while the project is in progress. In our estimation, the criteria should all be met to a certain degree for a project or an innovation to be defined as a regional flagship, but which criteria are more essential than others may differ between projects and initiatives.

The questions should be answered on a scale of 1–5 with an accompanying justification for the estimate. The purpose of the questionnaire is to gain insight into the extent that a project can be considered a regional flagship. It also clarifies the project's strengths and which areas may need development.

3.4 The framework has been developed on the basis of lessons learned from major establishments and in collaboration with several regions

Region Östergötland, Region Dalarna, Region Kalmar and Region Västernorrland have tested the framework in ongoing projects, and their experience has contributed to developing the framework. Below is a brief description of their thoughts and reflections on what it has been like to use the framework.

REGION ÖSTERGÖTLAND DESCRIBED THE FRAMEWORK AS A VALUE CREATOR

Region Östergötland leads the collaborative forums East Sweden Innovation Network (ESIN) and Forum for Smart Specialisation (FISS), which bring stakeholders in Östergötland's innovation support system together and can identify potential flagship projects and issues common to Östergötland's areas of strength in smart specialisation.

ESIN is an open network with broad representation, expertise and experience composed of the stakeholders in the regional innovation support system. It is led by Region Östergötland and focuses on issues of a strategic nature in regard to smart specialisation, innovation support and efforts to benefit the region's business community, academia and public sector.

FISS is also led by Region Östergötland and consists of the co-ordinators for the region's areas of strength. The forum focuses on these strengths and the various challenges that need to be addressed. If necessary, the forum can also discuss issues related to innovation support other than smart specialisation for the benefit of the region's business community, academia and public sector.

Based on the challenges identified in the Development Strategy for Östergötland and the four challenge areas, Smart Industry, Sustainable Food Supply, Tomorrow's Energy Solutions, and Life Science, Welfare Technology and eHealth that Östergötland shares with Uppsala, Örebro, Sörmland and Västmanland as part of the East-Central Sweden collaboration, a number of potential flagships have discussed in ESIN and FISS. These potential flagships have been identified by:

1. Identifying challenges

2. Identifying strengths, skills and resources that cut across several areas of strength

3. Quality assurance based on the input that was provided by the experts in the Advisory Board, and

4. Presenting, establishing and revising in ESIN.

In this regard, Region Östergötland tested a number of potential project concepts and also actualised a concrete project application linked to several of the above-mentioned challenge areas but with a particular focus on the challenge area "Tomorrow's Energy Solution". The application is entitled "Circular Economy in Östergötland and Örebro County" and concerns increasing energy and resource efficiency in the form of industrial and urban symbiosis and a higher usage of bio-based raw materials. The application has been submitted to the European Regional Development Fund (ERUF).

Region Östergötland's process involved colliding some of the regional areas of strength in its smart specialisation strategy against each other as a means of identifying new innovation areas. The initiative has since been pressure tested against the framework of this feasibility study project and it was determined that it worked well as a method of assessing whether a project has the potential to become a regional flagship. Connections that have proved particularly relevant based on criteria identified in the feasibility study are:

- Cross-border, interdisciplinary collaboration – can in many ways be compared to the cross-collaboration that was pursued between the regional areas of strength in Region Östergötland's smart specialisation strategy.

- Comparative advantages – have already been identified via the regional areas of strength, hence they are directly comparable

- Appeal and site development – Region Östergötland is working intensively to find synergies between innovation work, investment and establishment. This is to enable the area to be used as leverage in regional development work.

In the collaboration in East-Central Sweden regarding the joint programme for the European Regional Development Fund, there is ongoing dialogue concerning the implementation of flagships to achieve real transformation in the implementation of the programme. However, it is currently unclear whether the framework developed by this project will be utilised in these processes.

As far Region Östergötland is concerned, the framework is a potential aid in the prioritisation of regional development funds (so-called 1:1 funding). There is a very high demand for these funds and has been for some time. This has led to strict prioritisation on the part of the regional authority. One way to achieve a higher return on these funds is believed to be investments in major cross-sector, cross-disciplinary flagships that address major societal challenges that require complex measures and solutions. In this case, the framework could provide support in identifying and evaluating various types of project initiative.

REGION DALARNA USED THE FRAMEWORK TO GAIN IN-DEPTH UNDERSTANDING OF HOW PROJECTS CAN BECOME REGIONAL FLAGSHIPS

Region Dalarna has used the framework to test whether two major ongoing projects can become regional flagships. Regional representatives reported that the work carried out by Linköping Science Park in regard to the regional flagship project had been incredibly rewarding.

"In addition to the study visits we attended, from which we gained new perspectives, the strategic work on what constitutes a flagship project has helped us to see the bigger picture."

The region carried out an overview of their project based on the criteria that characterise a flagship. They concluded that Dalarna is currently not running a regional flagship. At the same time, they gained a better understanding of what needs to be done to set up a regional flagship, which would strengthen the region because it could become something to unite around. When testing the framework, they realised, for example, that they needed to develop their collaborative capacity and operate in a more challenge-driven and mission-oriented way. Region Dalarna described the framework as sound and usable. With the help of the framework, they have also come to realise that a project they are currently applying for could become a regional flagship.

One additional piece of advice from Region Dalarna was that the framework is helpful, but it must not be too restrictive. If funding is granted on the basis of the framework, it will be more difficult for entrepreneur-driven projects to receive funds as they do not fit into the framework.

REGION KALMAR AND KALMAR SCIENCE PARK BELIEVE THAT THE FRAMEWORK WOULD HAVE BEEN VALUABLE WHEN WORKING WITH A LARGER FLAGSHIP

Since 2010, Region Kalmar has been running the "eHealth arena" flagship in collaboration with Kalmar Science Park, 12 municipalities and Linnaeus University. The cornerstone of the project was that the region would become the best in the world at digitalisation and eHealth. The field was considered a political priority due to the fact that the eHealth authority had been relocated to Kalmar and added to the region's areas of strength thanks to a strong pharmacology programme. The region brought in an investigator to examine eHealth clusters in Kalmar County. The region wanted to set a vision of Kalmar becoming a centre for eHealth development, focusing on growth, creating benefits for local residents and establishing this in all the guidelines in the national vision. The investigator mapped it over the course of a year.

The investigator saw connections to collaboration and structures, as well as the entire system perspective. There was a steering group with a high level of decision-making authority, which allowed decisions to be made on the spot. Consensus on what was to be done was mandatory.

According to representatives from Kalmar Science Park that have studied the framework, its components correspond to the equivalent image that the region pictured from the outset. It is also consistent with what the investigator considered was of great importance in achieving long-term impacts.

Kalmar Science Park's view was that the framework would have been helpful if it had been available to them from the outset, above all to understand all the different elements and aspects. They had not expected the work to create such major challenges along the way, especially inwards towards the region.

"It would have been fantastic if we'd had the framework from the outset, I'm absolutely sure of that."

REGION VÄSTERNORRLAND AND BIZMAKER SEE THE FRAMEWORK AS VALUABLE IN TERMS OF THE TREMENDOUS NEED FOR TRANSITION

Region Västernorrland and BizMaker run publicly funded development projects to advance the regional innovation system and facilitate the growth of further innovative companies and organisations in Västernorrland. Five major projects are currently ongoing in the region, which entails a tremendous need for transition. Representatives from BizMaker

and Region Västernorrland believe that the framework will prove very important in the work to "Think right and above all do the right thing".

In the view of the representatives from BizMaker and Region Västernorrland, the framework can be used as a tool to create a symbiosis between the major projects that the region is running. They were also of the opinion that the criteria for evaluating and assessing an innovation or project as valuable.

"The criteria are great, fantastic checklist. Well compiled, comes in the right context."

They said that they often become mired in discussions about project funding, but that it is important to start at the right end. First, look at the "what" and the "how" and after that it can become a project.

"As a region and as the body responsible for regional development, we need to commit to prioritising important initiatives."

They went on to say:

"When we tested the framework on some of our upcoming mega-projects in Västernorrland, we understood the importance of a structured framework in facilitating the regional mobilisation that is essential to achieving the social transformation that we have to implement."

According to the representatives, the framework can contribute to fostering dialogue between different parties.

"From BizMaker's perspective, the framework will facilitate our dialogue with the regional authority and municipalities because it creates consensus on the prerequisites for successfully achieving societal transformation through large-scale projects.".

4. LESSONS LEARNED FROM LARGE-SCALE TRANSFOR-MATION PROJECTS

Within the framework of the field studies, lessons have been learned from large-scale transformation projects in Sweden (Skellefteå) and the rest of Europe that show how they managed major initiatives by means of an approach that enables system transformation. Based on the field studies and interviews with experts, we can say that it is possible to separate these lessons on the basis of the two categories that have been described in Chapter 3, Systems Perspective and Enabling Approaches.

In the following chapter, we describe concrete examples of how Skellefteå Municipality and the European initiatives RUGGEDISED, ATELIER and Leuven 2030 applied a systems perspective and enabling approaches. These practical examples can facilitate an understanding of how the framework could be used in practice.

4.1 Transformation and growth with a starting point in Skellefteå

Skellefteå – the frontier city, the city of wood, Swedish industry's new growth site, the light of the North, Klondike, the forest, the mine and the river. Descriptions of Skellefteå are many and various, and highlight both its enterprising spirit and the municipality's comparative advantages. During a three-day study visit in August 2022, we gained an insight into the enormous transformation that Skellefteå has been undergoing in the last decade or so. In the 2010s, it was a different story. The municipality was standing still and in a state of stagnation. This was the Skellefteå that the newly appointed Municipal Chief Executive took on. After extensive dialogue with local residents and the business community, the municipality made a decision to invest. On this basis, visions, strategies and plans were drawn up, and the municipality initiated a transformation journey. When Northvolt submitted a request to establish in 2017, it was completely in line with Skellefteå's ongoing transformation. During the journey, it also became clear that Northvolt's establishment had been prioritised at national level as the government appointed a national co-ordinator for the new industrialisation in northern Sweden.

A symbol of the transformation that Skellefteå has undergone is Kulturhuset Sara. The decision to build the cultural centre, which is currently one of the world's tallest wooden buildings, was taken a few years before Northvolt's request to establish came up for discussion. The cultural centre was completed in 2021. Today, the investment in the cultural centre is considered an important element of the forward thinking that Skellefteå is demonstrating in relation to other relevant establishment locations. When Northvolt submitted its request, the municipality had already come a long way in its transformation. Due to its political stability and with comparative advantages based on resources such as the Skellefteå Kraft power company, its own electricity grid, its own municipal airport and its own seaport, the municipality was quickly able to put together an attractive proposal and promising solutions regarding energy, logistics, distribution and recycling. The proposal was packaged together with a well-planned reception when Northvolt visited Skellefteå prior to the impending decision on the establishment location. In parallel, an active advocacy campaign that included advertising in the national press was conducted. Node Pole, the strategic consultancy for energy-intensive establishments jointly owned by Vattenfall and Skellefteå Kraft, was commissioned to lead the establishment project with the aim of attracting energy-intensive businesses to Sweden.

4.2 Lighthouse projects in the Netherlands and Belgium

In the three European initiatives in RUGGEDISED, ATELIER and Leuven 2030, the concept was to create the prerequisites for scalability and large-scale transformation right from the outset. The basis of the projects was that they should act as a response to both national and European climate policy goals, but also align with political priorities at the local level. In all three European cases, the cities took the lead in driving transformation and initiating joint resource mobilisations. The EU's Open Calls for flagship and "lighthouse projects" focused on Smart City and the climate transition in European cities.

The projects involve organising and leading large stakeholder networks from different sectors of society. Building long-term trust and establishing footholds in local and regional contexts was crucial, as well as rallying behind a shared vision in order to find a common way forward while simultaneously respecting each other's perspectives.

4.3 A systems perspective is crucial to the success of a large-scale transformation project

Lessons learned from Skellefteå, Amsterdam and Rotterdam show that it is necessary for the stakeholders in regions or municipalities to apply a systems perspective when developing an initiative. It has to be understood that several systems will need to interact in order for an initiative to be scaled up. This includes, for example, the existence of efficient infrastructure, knowledge of available established funding streams and a good understanding of the regulations and permit processes that will be affected. It requires the commitment of relevant stakeholders with the right skills and the involvement of needs owners. In addition, it is also important that there is some idea of how to foster the acceptance and adoption capacity of the local community, for example by establishing permissive norms and values that enable transformation and adaptability. It also includes an awareness of the prevailing norms and values in a particular region in order to understand how these may need to be strengthened or adapted to support sustainable development. In the following section, we provide a detailed account of the lessons learned from applying a systems perspective as an approach.

INITIATIVES ALIGNED WITH POLITICAL DIRECTIONS AND COMPARATIVE ADVANTAGES

Several of the stakeholders in Skellefteå, Amsterdam and Rotterdam emphasised the importance of grounding the development of large-scale initiatives in political ambitions and agendas. This includes international as well as national, regional and local strategies and agendas. The initiative must also be balanced with the site's character and development potential – as well as with the comparative advantages of the region or municipality. This enables interaction between bottom-up and top-down processes that can contribute to commitment based on shared priorities.

In order for regional authorities or municipalities to possess the capacity to scale an initiative up to a regional flagship, the initiative should be aligned with political directions because this assures the conditions for the initiative to be prioritised by decision-makers and makes it easier to obtain funding and achieve joint resource mobilisation. If the initiative is to become a flagship and facilitate scale-up, it should be based on the comparative advantages in a particular region or municipality, or in a specific industry or sector. The region should also have a high degree of appeal, or a plan for enhancing its appeal, because a regional flagship requires that both the business community and local residents will want to work and live in the area.

INVOLVE NEEDS OWNERS AND RELEVANT STAKEHOLDERS WITH THE RIGHT SKILLS

Lessons learned from both national and international initiatives show that it often takes longer than expected to plan for and set up a large-scale establishment. Thus, continuous networking and the maintenance of local/regional meeting places is of great importance – in order to quickly involve the right stakeholders with the right skills when opportunities arise. Several of the stakeholders that we spoke to highlighted the importance of recruiting "high profile stakeholders" for flagship initiatives, in other words people who enjoy a high level of trust in society and who can act as ambassadors for an investment over time. Although regions endeavour to build structural capital and ensure that the projects are independent of individuals, several emphasised that they are dependent on individuals because "it's a people business". Lessons learned from the projects we visited also showed that it is initially important to let these processes take time in order to allow the buy-in process to take its course and achieve consensus on the purpose and goal of the transformation.

All three initiatives in Europe were initiated at local level. In Europe, the cities are playing a prominent role in climate initiatives. Their mayors are often passionate about climate transition; hence they possess the relevant skills. Representatives from the ATELIER project in Amsterdam were of the opinion that it is important to take time and "Go slow to go fast". This involves creating the conditions for a sustainable project plan in which a large proportion of the time is spent on remaining grounded in the needs and in the project/transformation process, and that the political leadership is constantly involved in order to create legitimacy and momentum.

In regard to the planning process and projection, the cities have addressed these tasks by taking stock of and accumulating ongoing initiatives, which several describe as "portfolio logic". Several parallel projects of various sizes are gathered under a single umbrella, after which they look for synergies and connections in order to bring about a transition during the next step. The goal is to scale up and achieve comprehensive change. Via a "bottom-up, top-down" logic, they try to enable the use of dedicated individuals and ongoing initiatives to create the right prerequisites to scale up and accomplish large-scale change by meeting national and European climate goals and aims.

According to municipal representatives from Skellefteå and Rotterdam, establishing an initiative amongst political representatives at an early stage in the process creates the prerequisites for political support. Continuous buy-in should not be underestimated because it ensures that misunderstandings and conflicts are avoided and bridges possible political shifts. Several of them put it this way – the more transparent a project, the better.

Stakeholders in Skellefteå Municipality and Region Västerbotten as well as representatives from the civic associations and the business community highlighted consultation between stakeholder operations and ongoing processes as essential, given the high pace of planning and investment required to stay on schedule. This consultation enabled stakeholders to support each other's work and facilitated the progress of projects. This is because information and decisions concerning one stakeholder can be shared with others, which encourages proactivity in facilitating more stakeholders as the project progresses. Skellefteå Municipality and Region Västerbotten have jointly established what they call a "Transformation Office", where representatives can monitor a wide range of processes and ensure that they develop according to schedule. In addition, the office can identify risks, for example difficulties with permit processes and other regulatory challenges at local, regional or national level. The joint consultation enables these challenges to be identified and mitigated along the way.

CULTURES, NORMS AND VALUES

The importance of cultures, norms and values was highlighted by all the stakeholders during our study visits. Devoting time in conjunction with start-up to building trust between the parties is very impactful in the long term. Likewise, it is important to establish joint commitment between the parties to the long-term purpose and goal to ensure that everyone feels that they share ownership of the process. In Leuven, representatives highlighted the importance of being "Equal with your partners". Although on the one hand it is important that clear leadership exists, on the other it is important that every party feels included and that they have their say in order to feel fully involved. Transparency and openness were emphasised, as well as the importance of continuous buy-in to ensure that all parties pull in the same direction and at the same pace. In Rotterdam, the representatives highlighted that they felt that their "ambitious, opportunity-focused and slightly arrogant" mentality had been a successful approach for them.

One challenge that was brought up by the representatives in Rotterdam was the issue of developing and maintaining an innovative culture. They described innovation as a learning process that needs space to test new methods and approaches as well the courage to fail in order to find the right way forward. It was felt that this need sometimes conflicted with the city's/municipality's aim of focusing on optimising and streamlining existing operations in order to create more value for taxpayers. They have tried to separate the innovative processes from the day-to-day management to allow them more space to work innovatively. All the stakeholders emphasised the importance of an adaptive culture that is open to change and to trying new approaches, solutions and technology.

In Skellefteå, representatives highlighted the importance of familiarity with the local culture and values and using them to create movement. They pointed out that these local values, with their deep roots in the church, had cultivated a culture of "doing the right thing". The healthy team spirit and openness to collaboration was mentioned as a strength, while the prevailing norm that "you mustn't get too big for your boots" was considered to be a complicating factor. However, what the majority of people had in common was that they were able to come together in the realisation that a powerful transformation was needed to regenerate Skellefteå.

INFRASTRUCTURE AND PRODUCTION SYSTEMS

Infrastructure can be seen from different perspectives when examining regional flagships. On the one hand, it can pertain to infrastructure from a societal perspective – i.e. the housing, roads, energy, education, healthcare and social care necessary to maintain critical functions in a society. In turn, these can constitute infrastructure for innovation. For example, buildings can be used to accelerate the climate transition by mapping and plugging energy leakages using smart energy systems, or by mapping energy usage with the aim of influencing behaviour via technology and incentives.

Infrastructure can also refer to the existence of an infrastructure for innovation. In this respect, business development, technology and new approaches are important in bringing about transformation.

Through the national co-ordinator for the new industrialisation in northern Sweden, the municipality and the region of Skellefteå have a channel to establish dialogue with the government and advocate for issues related to infrastructure and transport as well as education and skills supply. An efficient infrastructure for skills supply is one issue that was raised by the majority of stakeholders during our visit to Skellefteå. The shortage of skills, competition for existing skills and the need for more vocational training were considered a challenge. In Skellefteå, a Multicampus has been established to serve as a platform for educational initiatives, with the municipality gathering a range of educational options such as vocational programmes and Swedish for Immigrants etc., as well as a higher vocational college, a university and the Research Institutes of Sweden (RISE) in order to satisfy Skellefteå's need for skills in the long term.

There are many lessons to be learned from the efforts in Skellefteå. The success factors have undoubtedly been the good collaboration, which in turn was based on clear expectations and prerequisites, a tremendous team spirit as well both the willingness and the ability to find solutions to challenging problems. The main challenge has been the speed of industrial establishment and ensuring that the planning and organisation of the various projects succeeded in keeping pace. This was particularly noticeable in housing construction, skills provision and joint learning in regard to multi-level governance in the public sector. Lessons learned from large establishments such as the one in Skellefteå show that the entire county's capacity is an asset in creating appealing and varied housing and living environments, as well for achieving success in supplying skills.

Skellefteå also stands out due to its ability to innovate with the goals of finding new solutions to the needs that have arisen in the city and the region during the growth. New solutions have been developed based on local history and conditions, which in several respects can serve as a model for other sites. An example of this is the Multicampus solution.

APPROPRIATE TECHNOLOGY AND PROCESSES

Digitalisation is a prerequisite for addressing many of our global challenges. Access to broadband, 5G roll-out, data sharing and security are issues of paramount importance for innovation. Likewise, cities represent potential test beds for new innovative solutions and new technologies. In turn, how cities and regions create conditions that stimulate and implement innovation depends on how they are organised, the prevailing political priorities, budget distribution – as well as regulations that can both inhibit and benefit development.

In Skellefteå, electrification and the desire to switch to sustainable industry have been the enablers of the current growth. In the same way, technology and enabling approaches have been crucial to enabling Rotterdam, Amsterdam and Leuven to switch to smarter climate solutions in their cities, thereby contributing to reducing emissions.

FUNDING STREAMS

An efficient and robust funding model is a necessity in advancing the development of a regional flagship. Stakeholders from Skellefteå as well as from Amsterdam and Rotterdam emphasised the importance of creating an investment plan, one in which the public sector initially takes on more risk, but which from the outset includes a strategic plan to attract private capital with the aim of becoming climate neutral.

The stakeholders highlighted various forms of funding model that can be advantageous. In the Netherlands, for example, they formed a consortium for joint ownership and joint funding between stakeholders.

Many of the municipal investments made in Skellefteå have come from public sources, and during our visit Skellefteå Municipality described what an advantage the local authority corporation they own had been. The political majority also facilitated decision-making and swift action. The municipality emphasised that they could not rely on state funds, Northvolt's establishment or other industrial investments and instead they had chosen to believe that the expansion would lead to further investment. They also said that they had built resilience into how they organise for external changes, for example business cycles or natural disasters. They believe that the insight around this and how well it is tackled depends on a municipality's ability to prepare, as well as its willingness to dare to apply a long-term perspective, for example one with strategies that are established from civil society level right up to the highest political leadership.

In Leuven, the project management for Leuven 2030 highlighted how they had actively worked to map existing funding streams, i.e. existing projects and initiatives with money in circulation, and worked to redirect some of the cash flow to create joint resource mobilisations. This approach had been successful for them.

Brussels has developed a programme to fund large-scale mobilisations based on an organised funding structure for long-term investments that focuses on specific themes. The Key Digital Technologies Joint Undertakings (KDT JU) is one (of several) public-private partnership (PPP) programmes that manage an R&I programme aimed at reinforcing the EU's strategic autonomy in the electronic components and systems sector. The funding comes from the European Commission via Horizon Europe, funding authorities in participating countries, and participating organisations (equivalent to Swedish Vinnova). There are several organised Joint Undertakings in various fields, and KDT JU focuses on Advanced Digitalisation.

KDT JU funds projects to ensure that the EU has the necessary expertise in key technologies to enable competitive leadership as the world's digital economy. This includes the development of advanced semiconductors and applications that are critical to European society and which contribute to the EU's digital strategy and the European Green Deal. KDT JU-funded projects provide smart solutions for mobility, healthcare, the environment, energy, a digital society and manufacturing. The model is therefore a productive source of inspiration in several contexts.

REGULATIONS AND PERMIT PROCESSES

Technological advancement is taking place exponentially, while organisational and regulatory development is taking place linearly. As a result, our societies are finding it difficult to implement new solutions and new technology at the rate we should be able to. In turn, this could have an important impact on how quickly we can implement and scale solutions that reduce our climate impact. In our study visits to Europe, representatives from the various projects highlighted the importance of developing dynamic regulations that are adapted to the modern era. When they are working optimally, regulations and permit processes are important enablers of regional transformation, but they can also be an impediment when they cannot keep pace with planned development. Goal conflicts between different interests or a lack of expertise in the public administrations that have been tasked

with managing the issuance of certain permits can hamper the transformation process. The somewhat limited mission of the county administrations to contribute to regional development by balancing conflicting goals is an example of imbalance. It is therefore essential to have both the necessary skills and the time for dialogue on goal conflicts and what is required to comply with the legislation.

The permit process for Northvolt proceeded very quickly, which according to representatives from the municipality and the co-ordinator for the new industrialisation in northern Sweden can be explained by the fact that the municipality received a great deal of support from the County Administrative Board. The co-ordinator held extensive dialogues with companies, environmental authorities and the Land and Environmental Court at an early stage. During these conversations, the process that subsequently led to permission being granted for Northvolt's operations was highlighted as a positive example. The process was based on close dialogue between the Västerbotten County Administrative Board and the applicant company (Larsson, 2022).

Lessons learned from the expansion in Skellefteå have taught us that several of the obstacles that arose during the transformation journey have largely concerned regulations and permit processes. A key success factor in managing this successfully was the Transformation Office that was established in Skellefteå, which consisted of municipal and regional representatives who monitored developments on an overall level and could jointly identify any obstacles along the way. The Transformation Office played an enabling role by identifying when processes were at critical stages and where regulations might pose a problem. A prerequisite for success with this was the breadth of expertise and the cross-border approach that caught up important issues from a systems perspective.

The national co-ordinator for the new industrialisation in northern Sweden played an important role in regard to Skellefteå because he could act as a spokesperson for the municipality and the regional authority, for example in processes related to issuance of permits, regulations and legislation at national level. Both the municipality and the region emphasised that this had created momentum in the process.

4.4 Enabling approaches

In order to be able to build capacity for large-scale transformations and conduct extensive projects, it is important that there is an enabling organisation in place, as well as an enabling approach.

CROSS-BORDER, INTERDISCIPLINARY AND MULTI-LEVEL COLLABORATION IS CRUCIAL

In order to realise innovative visions and goals, it is necessary to gather a wide range of stakeholders for joint collaboration. The systems perspective requires that there be a broad representation of skills, roles, organisations and industries to ensure that issues are clarified and understood from multiple perspectives. Together, the stakeholders need to draw up a plan that identifies the common goal – and use every available tool to create a co-ordinated portfolio of projects and solutions to achieve the shared aims. This plan also needs to be examined from a multi-level governance perspective to ensure that every prerequisite is included.

Different individuals that we met on our national and international study visits reiterated the fact that multi-level and cross-disciplinary collaboration is one of the keys to breaking down traditional approaches that usually take place in silos. The importance of collaborating with multiple stakeholders was described as crucial to achieving more impact than a single stakeholder would be able to achieve on its own.

In Skellefteå, the culture of collaboration is well exemplified by the established Transformation Office, which was launched by Skellefteå Municipality and Region Västerbotten and which deals with horizontal issues on a regular basis. Several of the representatives highlighted the fact that consultation was extremely important due to the high rate of planning and investment required to ensure that Skellefteå's growth stayed on schedule. A further example of collaboration in Skellefteå is the collaborative platform known as "Sustainable Skellefteå", which is run by the local authority corporation and focuses on initiating collaboration, creating new opportunities and putting Skellefteå on the map in three areas: sustainable construction, sustainable mobility and sustainable industry. The platform invites local stakeholders and external parties to collaborate. The stakeholders that are currently participating in the initiative are Skellefteå Municipality, Skellefteå Kraft, Skebo, Skellefteå Industrihus, Skellefteå Science City, Skellefteå Buss and Skellefteå Airport. All efforts are aimed at achieving Skellefteå's vision of becoming "a sustainable place for a better everyday life".

"At the back of people's minds is the fact that we still need a lot of structured learning. But we haven't reached that point yet. We haven't had the energy, everybody's going at full tilt everywhere," was how one of the representatives that we met during the trip summed it up.

For all three projects in Europe, it has been a matter of creating collaborative platforms for stakeholders who had not previously collaborated with each other and who operated in different sectors and disciplines as well as in different roles. Building long-term trust and creating buy-in in local and regional contexts has been crucial – as well as rallying behind a shared vision and establishing a common way forward with respect for each other's perspectives. In Europe, municipal representatives in Amsterdam, Rotterdam and Leuven acknowledged the importance of investing in trust-building activities and pointed out that the Nordic countries have an advantage in terms of the conditions for value-creating collaborative initiatives. In their view, this could be explained by the higher degree of trust in public actors in local communities in the northern European countries compared to other countries in Europe.

In addition, several of the stakeholders highlighted the importance of maintaining these networks and the fact that although a great deal can be incorporated into processes and structures, it is ultimately people who do business with other people. For this reason, the importance of maintaining meeting places was emphasised as well as systematic efforts to bring people from different disciplines, organisations and sectors together with the aim of achieving systemic shifts. Furthermore, an inquisitive and open approach combined with a desire to succeed was also considered a recipe for success.

DESIGNATED LEADERSHIP FACILITATES IMPLEMENTATION

Lessons learned from both national and international societal transformations show that clear, designated leadership of large-scale establishments is a necessity. Clear leadership creates momentum, both prior to a transformation and while it is in progress.

Representatives from the Municipality of Amsterdam, which conducted the comprehensive EU project ATELIER, reported that clear leadership of the project by the municipality contributed to buy-in and stability. The municipality was involved for the duration of the project and developed a process to facilitate the involvement of partners, local residents and other stakeholders at different times and in different phases of the process, which created joint process ownership among the stakeholders involved. Transparency and openness were highlighted as important elements in generating commitment, participation and a sense of shared ownership, despite the fact that it was the municipalities that were leading the projects.

According to the municipality, it is crucial that there is clear, long-term leadership, as well as a strong foundation over time – regionally established leaders in the business community and society who support and build long-term confidence in the project. These should be people who are passionate, brave and determined – and above all – collaborative. The municipality also highlighted the importance of a dynamic network and dynamic business models to ensure that the flagship remains relevant in the long term and adapts to prevailing changes in the world around it. Projects and activities may well change over time, and likewise the dynamics of the ecosystem, but a few anchors will remain stable and underpin the initiative.

This clear leadership and joint ownership based on trust and confidence guarantees shared commitment and risk-taking, and it also requires responsibility from the parties involved. The Municipality of Amsterdam particularly emphasised that it is important that the participating stakeholders actually feel committed and included for the approach to succeed. The representatives from Amsterdam described how they successfully involved stakeholders at different times during the process whose experience and expertise were particularly relevant rather than involving all the stakeholders all the time and to the same extent.

Skellefteå initiated the work to build up its capacity for societal transformation a long time before Northvolt established in the region. As early as 10 years prior to the establishment, Skellefteå Municipality had assumed the leadership role in transforming Skellefteå from a municipality with a declining population into one of growth. Local residents, the business community and the civic associations were encouraged to become involved at an early stage of the strategy selection process, which created consensus and buy-in around the transformation journey that took place in the municipality. In 2015, the municipality established strategies and visions for where Skellefteå would be by 2020 and worked systematically with the strategy both internally and externally, including via strong communication and marketing to promote Skellefteå as an appealing location.

STRONG ACTORS WITH A HIGH RISK APPETITE ENABLE INNOVATION

Every municipality and region highlighted courage and risk-taking as an important factor in daring to aim for higher goals. Skellefteå showed particular courage when it mobilised to enable the establishment of Northvolt by making promises that few municipalities could have lived up to. This would not have been possible without collective risk-taking in which the parties chose to bet on the potential for growth rather than holding back because of risk aversion.

The European regions also emphasised collective risk-taking as an enabler in making truly transformative strides, as well as the fact that it is frequently the public sector that has to lead the way and take on the initial risk before the business community can be expected to step in and invest. In Amsterdam and Rotterdam, municipal representatives described how they mobilised resources quickly before drafting the applications for the Lighthouse Initiative call, and that they earmarked significant resources for this work with the aim of winning.

USER INVOLVEMENT IS A KEY FACTOR IN LOCAL BUY-IN AND COMMITMENT

All the municipalities have been committed to civic dialogue and involving the local community in conversations about future efforts and/or projects. Several also emphasised that this had been hard, and that they had had difficulty finding the forms to succeed. Municipal representatives from Rotterdam and Skellefteå emphasised the importance of transparency as regards the schedules as well the content in order to establish buy-in in the local community.

Representatives from the municipalities were of the opinion that it had been valuable to work using the mission-driven innovation method to bring local residents on board. Work was conducted to pilot and test concepts with the users and listen to their views before developing the concepts further. This resulted in the local community being more open to transformation. The ATELIER Project operated on a basis of citizen co-creation, i.e. with the aim of ensuring that innovation would create value for society.

Representatives from Leuven stressed that learning needs to be packaged in such a way that knowledge can be shared and used by other stakeholders, for example by municipalities prior to planned societal transformation projects. It is important to respect that establishing buy-in takes time and that in order to involve a broad representation of society, this needs to take place via long-term advocacy efforts.

According to representatives from Leuven Municipality, they succeeded in generating commitment in the local community by applying a bottom-up approach because it contributed to an understanding of the role that stakeholders play in a transformation process. Combined with frequent civic dialogues, this helped the municipality make well-grounded decisions and created space for creativity and a sense of community that contributed to the commitment of the local residents.

In Skellefteå, the preparatory work that the municipality carried out in collaboration with the regional authorities, the business community, civic associations and local residents helped create the conditions that enabled Skellefteå Municipality to attract and accommodate a major establishment. When the opportunity arose, the municipality took the lead in developing an attractive offer for the establishment of Northvolt in Skellefteå, but also involved the municipal company Skellefteå Kraft and its subsidiary Node Pole. Together they devised a strategy for how the municipality could package its offer, both in writing and during the visits that Northvolt conducted on site in Skellefteå.

Communication and storytelling are additonal essential tools for creating user involvement. Communication generates curiosity, commitment and participation. Storytelling was highlighted as a useful tool, and Rotterdam, Amsterdam and Leuven all called attention to, inter alia, the mapping of ongoing initiatives and projects that they collected in portfolios, which enabled these to be communicated more powerfully.

Skellefteå Municipality has worked systematically with storytelling, marketing and communications since 2011, partly with the aim of reversing a depopulation trend into one of growth, and partly to involve the entire community in the transformation journey. The municipality has been committed to gathering knowledge from previous experience, projects and local residents in order to understand how it can create a transformation journey and turn the tide of people moving away into one of people moving in. The municipality has acted gradually to gather knowledge through focus groups and citizen dialogue, developed a branding platform, and then with launch and implementation. One successful concept was establishing the brand in the focus groups right from the outset. All the representatives we met emphasised the utmost importance of profiling and communicating the joint work..

ORGANISATION AND INNOVATION PLATFORMS

On several occasions during our visits, we revisited the bottom-up, top-down perspective. A critical factor in being able to mobilise joint resources and act rapidly when opportunities arise is that there is continuous regional/local work to maintain networks and meeting places, connect stakeholders across borders and create leeway for unexpected events by growing networks. This work needs to be organised and structured, and, above all, sustained in the long term.

In Leuven, it was researchers who initially engaged in building scenarios and describing what the community of Leuven needed to do to become climate neutral, after which the municipality stepped in and created the conditions for a jointly-owned "Leuven 2030". The researchers were given the opportunity to explain how they could contribute, a joint contract was then signed by a wide range of stakeholders, and together they created an activity plan and identified possible funding streams that would help turn their visions into reality.

Both Amsterdam and Rotterdam have established an organisational process for applying for EU funds for large-scale projects. Prior to applying for the ATELIER and RUGGEDISED lighthouse projects, a team of about 30 employees was involved in each municipality and formatted an "office" for what they described as the requirements of preparing an application for an EU call. In Rotterdam, a project manager was appointed with overall responsibility for the application, as well as a legal team that focused on the legal aspects of the arrangement, and in Amsterdam the professional help of a consulting firm was engaged to draw up the project application.

MULTI-LEVEL COLLABORATION CREATES THE CONDITIONS FOR SUSTAINABLE TRANSFORMATION

As previously mentioned in several paragraphs above, regional flagships have been initiated by means of a form of bottom-up, top-down logic, based on both international and national aims and political directions as well as from local and regional concentrations of skills and abilities. The actors at local, regional and national level need to interact in order to optimise the conditions for a regional flagship to contribute to transformation. This collaboration includes goal formulation and stakeholder constellations, but above all how multi-level governance can create enabling conditions via the knowledge that flows from national to local level – and from local to national level. Through this increased knowledge, the broader perspectives and the closer collaboration, new initiatives can take root

Once again, Skellefteå is a good example of how a municipality can foster successful relationships in a multi-level system via its organisational process. The fact that the municipality and the regional authority have collaborated so closely with each other and had the additional support of a national co-ordinator was described as a recipe for success. With the national co-ordinator's understanding of local and regional events, and with his knowledge of the process on a national level, he was able to act both as spokesperson and co-ordinator to proactively move some processes forward. With Skellefteå as a basis, new insights have been created into the needs that can arise in a regional context during a growth process – insights that can, in a best case scenario, create the conditions for establishing new solutions, processes and regulatory changes.

ENVIRONMENTAL SCANNING IS AN IMPORTANT COMPONENT OF ENSURING RELEVANCE

Rotterdam described how they have a plan for achieving "Europeanisation", i.e. that the EU becomes a natural part of everyday existence. They conduct active environmental scanning and build relationships with other countries. Leuven described how they take at least one inspiration trip every year to broaden their perspectives. Several of the representatives we met emphasised the importance of building networks across Europe in order to find partners for future projects in the long term. Once these relationships have been established, everything becomes very much easier.

5. CONCLUSIONS AND RECOMMENDATIONS

The following chapter summarises the main project conclusions. It also provides recommendations for continuing the work with regional flagship projects.

5.1 Summary conclusions

Following an extensive journey of study visits, framework development and testing with regions and in the business community, the following chapter summarises our most important conclusions from the work, and how key actors can apply system innovation to drive sustainable change and growth. We also identify important factors and insights that are crucial to the success of system innovation and present our collective lessons learned to provide guidance to regional authorities and municipalities in their continued efforts.

The conclusions of the feasibility study are as follows:

- The framework fills a gap and can be used as a basis for the next step to system innovation

- Regional authorities and municipalities are key actors in driving system innovation

- The government needs to create the economic conditions for long-term initiatives

- There are challenges within the current funding system for scaling regional initiatives

- There are challenging structures that need courageous leaders who dare to drive change

- Regional flagships can create the conditions for growth and large-scale transformation

- The design-driven process has been a success factor in developing the framework

THE FRAMEWORK FILLS A GAP AND CAN BE USED AS A BASIS FOR THE NEXT STEP TO SYSTEM INNOVATION

The feasibility study project shows that a combination of systems perspective and enabling approach is an important success factor when initiating and running regional flagships. A greater understanding of what needs to be done to run a regional flagship is necessary. In this respect, the project's view is that Framework – A Path to Regional Flagships can serve to support stakeholders when they join forces and strengthen the conditions for driving system-transforming initiatives.

REGIONAL AUTHORITIES AND MUNICIPALITIES ARE KEY ACTORS IN ACCELERATING SYSTEM INNOVATION

The feasibility study project shows that regional authorities and municipalities are key actors in accelerating system innovation. With their autonomy and assigned responsibility for regional development, they are in a unique position to expedite transformation. In a rapidly changing world, demands on municipalities and regional authorities to participate actively in the work of implementing and scaling up new solutions are increasing. With the help of regional innovation support actors such as science parks, clusters, incubators and ALMI, the state-owned startup investor, strategies and aims can be implemented in concrete activities and projects. This, in combination with the expanded responsibility of regional authorities for regional development, in addition to the healthcare mission, raises expectations in the surrounding world at both local and national level. In turn, the municipalities have an especially important role to play in transforming, for example, schools, senior care and infrastructure. Ownership of these areas means that they have a direct link to resources, decision-making and co-ordination, which provides a strong foundation for initiating, supporting and following up on transformation efforts. This ownership also gives regional and municipal authorities the legitimacy to act as agents of transformation and to engage other societal stakeholders such as other authorities, the business community, local residents and research institutions in joint efforts to foster sustainable growth and transformation.

Shouldering this responsibility is complex, and in the project's estimation successful mobilisation is crucial to involving the right stakeholders and creating opportunities to apply growth-inducing processes. Creating the right conditions for regional flagships to mobilise and the prerequisites for substantial activities in which numerous stakeholders contribute requires an ambitious joint vision. The New European Innovation Agenda emphasises the importance of missions in creating direction for major joint resource mobilisations. With a clear vision, stakeholder constellations can move from collaboration to interaction, which allows more stakeholders to contribute to achieving the vision based on their abilities and circumstances. In order to conduct this mobilisation, responsibility has to be taken for managing the complexity and the process, and the prerequisites must exist to do so. Regional and municipal authorities must develop a culture of innovation that focuses on learning as well as strengthening their own skills and capacity to control and manage complex transformation processes effectively. For this reason, understanding and exploiting the ownership that regional authorities and municipalities possess is an important prerequisite for succeeding with system innovation and sustainable transformation at regional and local level.

In the project's opinion, Framework – A Path to Regional Flagships represents an important step in the right direction. The framework will enable regional authorities, municipalities and the business community to analyse their conditions and work to improve them. It will serve as a support in identifying the necessary skills and how organisations can develop and train these capabilities, which is crucial if transformation is to succeed.

..BUT THE GOVERNMENT NEEDS TO CREATE THE ECONOMIC CONDITIONS FOR LONG-TERM INITIATIVES

In order to achieve system transformation, a broad representation of expertise, roles, organisations and industries is required to ensure that all perspectives are included, hence it is necessary to gather a wide range of stakeholders – in addition to regional authorities and municipalities – for transformation through collaboration. The government and authorities have an important role to play in supporting this process based on assignments and enabling funding streams. It is currently unusual for official funding at national level to be co-ordinated, and funding cycles are often relatively short, which makes it difficult for stakeholders to take a long-term approach to their work. Funding streams need to be strategic, transparent and long term to enable stability over time.

The feasibility study shows that more regional authorities are mobilising to launch regional flagships. Some regions are also leading the way with extensive business ventures such as the ones taking place in Västernorrland, Västerbotten and Norrbotten. These efforts need to be matched with investments in society to create the capacity for growth in the form of housing, infrastructure, welfare services and transport. These are major investments, hence they are challenging for the municipalities and regional authorities to cope with on their own.

Members of the feasibility study reference group and project management. Back row from left. Hans Holmström, CEO of Siemens Energy, Josefine Sandström, Rambøl, Anders Carlsson, Visual Sweden, Christian Sahlén, CEO of ACTIA Nordic AB, Fredrik Larsson, Linköping Science Park, Anna-Carin Ramsten, Vinnova, Per-Olof Bremer, vice-chancellor, Linköping University, Joakim Ljungkvist, Director of Trade and Industry, Norrköping Municipality, Mats Nyman, CEO of BizMaker, Louise Felldin, Director of Economic Development, Linköping Municipality, Anna Björklou, CEO, Epishine. Bottom row from the left: Frida Enebro, Linköping Science Park, Josefine Eriksen, Rambøll, Lena Miranda, Linköping Science Park, Niklas Tideklev, Strategist Innovation and Business, Region Östergötland, Ann Holmlid, County Councillor, County Administrative Board Östergötland.

THERE ARE CHALLENGES WITHIN THE CURRENT FUNDING SYSTEM FOR SCALING REGIONAL INITIATIVES

Municipalities and regional authorities hold great responsibility and mandates for regional development. The regional growth funds (so-called 1:1 funds) play a major role in enabling the regions to lay the groundwork for regional initiatives to meet both national and European strategies and efforts. Existing regional growth funds are unevenly distributed across the country because the distribution model is not appropriately designed for this day and age.

In addition, the EU's recent enforcement of state aid rules has made an already difficult situation for stakeholders wishing to apply for funding even more challenging. The Swedish model is based on local and regional mobilisation in which municipalities and regional authorities increase funding in order to receive national funds and ERDF funds. As a result of new practices that entail a change in the enforcement of state aid rules (Swedish Agency for Economic and Regional Growth, 2023), a large proportion of the funding is expected to come from private co-funding, for which the Swedish innovation system is not equipped. There is a risk that these exacerbating circumstances and the uncertainty over enforcement of the rules will bring Swedish innovation efforts to a standstill. In the long term, this will have a negative impact on Swedish competitiveness.

THERE ARE CHALLENGING STRUCTURES THAT NEED COURAGEOUS LEADERS WHO DARE TO DRIVE CHANGE

Even if the municipalities and regional authorities are important key actors, there are challenging structures and obstacles to working with system innovation and implementing large-scale transformation processes. For example, there are expectations from the business community and the surrounding world that the municipalities and regional authorities will lead the way in taking on risk. At the same time, municipal and regional finances are becoming increasingly strained as demographic trends place higher demands on future welfare services and as tax revenues decline. In addition, major built environment and infrastructure investments are needed, which are affected by rising electricity prices. Politicians are expected to be able to account for how our tax revenues are invested, and as a result there is an increasing demand for results in terms of resource efficiency and optimisation. This can come into direct conflict with the innovation process as learning is such an essential element of successful transformation. Thus, it is essential that there are courageous politicians and leaders who dare to prioritise innovation that focuses on learning and

development. It is also important that national funding is made available to underpin the ambitious efforts that are required.

REGIONAL FLAGSHIPS CAN CREATE THE CONDITIONS FOR GROWTH AND LARGE-SCALE TRANSFORMATION

Working with regional flagships is a way to create the conditions for future growth and pursue large-scale transformation. It is a process that is initiated locally and one in which the regional leadership has the opportunity to take ownership. The process includes ensuring and developing a number of capabilities that are not only beneficial to the area that the regional authority chooses to invest in, but also build its capacity to make important strategic choices, establish joint priorities and make collective investments that are conducive to advancing both societal transformation and sustainable growth on a major scale.

These capabilities can, for example, concern understanding and addressing problems and opportunities within the framework of the wider system in which they are included, and identifying and analysing the interaction between different stakeholders, institutions and structures that impact the region's development and transformation. It also includes building strong, long-term relationships between different stakeholders such as the public sector, the business community, academia and civil society in order to jointly develop and implement solutions that contribute to sustainable growth and transformation. A good way to build these capabilities is to ensure that the regional authorities, municipalities and business commmunities are equipped to run regional flagships.

The national perspective is also crucial because it requires multi-level collaboration to run a regional flagship.

THE DESIGN-DRIVEN PROCESS HAS BEEN A SUCCESS FACTOR IN DEVELOPING THE FRAMEWORK

Framework – A Path to Regional Flagships is the result of a design-driven process that has proven successful. The project employed an exploratory approach that involved a large number of stakeholders testing and co-creating together. In order to succeed with the co-creative work, it was essential that representatives in the Advisory Board collaborated extensively in order to become familiar with each other and build relationships – both in physical meetinga and in online ones. The study trips were also important for group bonding. The exploratory work was stimulating but challenging at times. It demanded that participants stick to the issues and apply a holistic approach, in addition to dealing with the high level of uncertainty and complexity that the exploratory work and process entailed.

5.2 Recommendations

The contents of the framework indicate important capabilities, prerequisites and approaches in order to succeed with system innovation. The framework is not an all-inclusive solution, but can be used to advantage as a starting point to create direction and understanding of the necessary capacity building. The feasibility study provides six recommendations for running regional flagships using the contents of the framework as a basis.

- Administer and promote usage of the framework

- Use the framework to identify priority areas for capacity building

- Create the conditions for initiating regional flagships with funding and capacity building

- Task the authorities with co-ordinating efforts that provide synergies at several levels

- Rethink the distribution of regional growth funds (1:1)

- Initiate further analysis

ADMINISTER AND PROMOTE USAGE OF THE FRAMEWORK

Ensure that the framework is administered and promote its further development. It has been tested within the scope of this project and adjusted on an ongoing basis. There is potential for further development to increase its relevance and usefulness. It is a continuous learning process. For this reason, we recommend that the framework be published and made accessible and appealing in order to increase its impact and contribute to more stakeholders basing their work on its principles. To ensure that the framework is used and developed, a stakeholder should take responsibility for administering it.

USE THE FRAMEWORK TO IDENTIFY PRIORITY AREAS FOR CAPACITY BUILDING

Stakeholders in regional and local innovation systems should develop their ability to work in a system-transforming manner, and absorb and manage the complexity and capacity to transform. The framework highlights important areas in which capacity can be developed in order to succeed and can therefore be used to advantage as a starting point in this work. Some stakeholders may need to develop and deliver the required capabilities based on their own specific regional context. For example, this can involve investment in strengthening a regional authority or municipality's

skills and capacity in mission-oriented innovation and learning. It can also mean building new collaborations between civil society, the business community, the public sector and academia. In addition, it is essential to develop a culture of continuous learning and reinforce organisational structures and processes that support system innovation.

CREATE THE CONDITIONS FOR INITIATING REGIONAL FLAGSHIPS WITH FUNDING AND CAPACITY BUILDING

In order to establish regional flagships, efforts are required in terms of funding and capacity building. State R&I funders should explore the option of funding system transformation projects at regional level, for example via Open Calls that have system transformation goals with regional freedom and adaptation. In addition, funders should explore the option of co-ordinating Open Calls or other financial support measures that can help generate interest in and opportunities for regional authorities to commit to system innovation and regional flagships. In our view, it is particularly appropriate to benefit from the Agency for Economic and Regional Growth's knowledge of regional development and Vinnova's knowledge of system innovation to create the right conditions and relevant Open Calls. This can contribute to safeguarding and developing Swedish innovation capacity. It might also be worthwhile to involve the Energy Agency, FORMAS and other potential stakeholders.

Both knowledge and the capacity to manage regional flagships with system transformation goals need to be strengthened. For this reason, we recommend that Vinnova initiates a learning effort for regional authorities and municipalities to help them build their capacity based on system innovation methodology and the framework. The Swedish Association of Local Authorities and Regions is an appropriate party to collaborate with in order to ensure target group adaptation. To ensure that the innovation system has access to the right skills, member associations such as iHubs, SNITTS and SISP can facilitate learning processes and exchanges of experience at national level as a complement to those conducted at regional level.

The regional authorities also need to create the conditions for running, owning and co-funding regional flagships. Hence it is necessary to prioritise and ensure that resources are available. This may entail developing new partnerships, seeking external funding sources or reallocating existing resources more efficiently.

TASK AUTHORITIES WITH CO-ORDINATING EFFORTS THAT PROVIDE SYNERGIES AT SEVERAL LEVELS

In order to run processes for system innovation and regional flagships successfully, it is necessary that research and innovation investments and ecosystems at local, national and EU level reinforce each other and contribute to synergies and possible leverage effects. Hence policies are required that foster collaboration with broad mobilisation and multi-level governance.

This not only requires collaboration, but also the ability to identify and accelerate efforts with an especially large systemic impact potential for Sweden. There are examples from Finland in which efforts with system innovation as an approach have been given all-out support by the Ministry of Affairs and Employment to build so-called "growth ecosystems" comprising a wide range of stakeholders and perspectives that create conditions for pushing through change.

At present, local, regional and national funding streams in Sweden lack co-ordination. For this reason, it is necessary to task authorities such as the Agency for Economic and Regional Growth and Vinnova with co-ordinating efforts that provide synergies between local, regional and national levels. It is also essential that these efforts are underpinned by shared visions based on broad buy-in and mobilisation from the regional ecosystem with a focus on system-transforming innovation.

RETHINK THE DISTRIBUTION OF REGIONAL GROWTH FUNDS (1:1)

In order to enable municipalities and regional authorities throughout the country to contribute to transformation and growth, the distribution of regional growth funds (1:1) should be reviewed and updated to suit our current day and age. Furthermore, municipalities and regional authorities, both large and small, should have the opportunity to contribute based on their own circumstances. The issue of how the enforcement of state aid rules will impact the Swedish innovation system should be given the highest priority to ensure that Sweden has the optimum conditions to continue important innovation and transformation efforts with a funding model that is compatible with our system.

INITIATE FURTHER ANALYSIS

Within the framework of the project, several possible areas of specialisation have been identified. The rest of the world is mobilising for development and innovation, and vigorous efforts are being made both in terms of policy advocacy initiatives and financial subsidies such as the American Inflation Reduction Act (IRA), which provides subsidies for green transition and green establishments, and special economic zones (SEZ) in Asia, Africa and South America, among other places. The purpose of the SEZs is to grant innovation companies/innovation environments tax incentives and regulatory relief in order to stimulate innovation. The European efforts, Partnership for Regional Innovation (PRI) and Regional Innovation Valleys (RIV), are an attempt to create a coherent innovation policy that can identify synergies between different programmes and efforts with the aim of accelerating green and digital transformation, focus on joint missions and resource mobilisations, improve conditions for startups and scaleups, and bridge the innovation divide between regions by investing in more collaborative projects that are interregional, transnational, cross-disciplinary and cross-sectoral. Europe has tremendous potential if we can succeed in translating this ambitious innovation agenda into concrete efforts to foster sustainable growth and transformation.

The project has identified two particularly relevant tracks to pursue:

- Study the effects of IRA and SEZ and other equivalent stimulus packages used internationally. Analyse the option of incentive programmes that support growth and transformation via regulatory relief and financial subsidies.

- In the event that stakeholders initiate flagships, either regional or interregional, further studies will be needed on how flagships best create impact and how progress can be measured. In order to achieve the desired impact, a clear vision or mission is needed to guide the work. The framework can be seen as an element in a mission-oriented approach. For this reason, we believe that the next step is to analyse how regional authorities and municipalities can to a greater extent base their work on a mission-oriented approach.

APPENDIX 1 DEFINITIONS OF TERMS

In the following appendix, we have defined a number of concepts that have been used in this feasibility study. The definitions were developed on the basis of the data collected within the framework of the feasibility study. The concepts are interpretations based on document studies, interviews and discussions in the Advisory Board.

Regional flagship: A regional flagship contributes to finding solutions to our shared societal challenges by approaching them in an innovative and system-transforming manner. The aim is to bring about transformative change that takes into account a wide range of perspectives and ultimately creates value for society.

Lighthouse project: A lighthouse project is a project or initiative that is innovative and effective, and which serves as a guiding example for others to follow. The designation "lighthouse" stems from the idea that these projects should act as beacons, highlighting new possibilities and opportunities for others in their respective fields. Lighthouse projects are typically characterised by their ability to challenge conventional thinking, solve complex issues and create a significant positive impact in their respective fields. They often involve advanced technology, interdisciplinary collaboration and a strong focus on achieving a specific goal or outcome.

Joint resource mobilisation: Joint resource mobilisation is the act of organising or preparing a group of relevant stakeholders to pool their efforts for a common cause, for example responding to a natural disaster, addressing a societal issue, or advancing environmental, societal and economic sustainability.

Transformation journey: A transformation journey can be initiated as a result of various factors, for example new market conditions, technological changes, changing needs or organisational challenges. A transformation journey requires careful planning and the implementation of numerous steps such as a situation analysis, the development of a strategy and an implementation plan, implementation of the changes themselves and follow-up of results.

Adaptability: Adaptability refers to the ability of an organisation, stakeholder or individual to adapt to new conditions, challenges and opportunities. It involves being able to anticipate and manage change successfully by means of a flexible and adaptable strategy. A high degree of adaptability also implies that stakeholders, individuals and organisations are receptive to new ideas, have a culture that encourages change and are prepared to invest in the transformation process.

APPENDIX 2 PREPARATORY QUESTIONS FOR STAKEHOLDERS AND ASSESSMENT CRITERIA

Based on the visual model of the framework, the project has developed preparatory questions for regional authorities, municipalities and the business community. The aim of these questions is to strengthen the capacity and ability of stakeholders to run a regional flagship.

In order for a project, a concept, a mobilisation or an initiative to become a regional flagship, stakeholders need to prepare and build up their capacity. For this reason, there may be a need for them to rethink their organisational processes and ability to manage system transformation projects, and how well equipped they are to implement or receive this type of project.

Managers at regional authorities and/or municipalities can ask themselves the following questions in order to ensure that they are well prepared and to boost their capacity.

1. Is there a broad political majority and stability in the region/municipality in favour of a regional flagship in the municipality/region? Is there consensus on important issues of the future?

2. Do designated municipal, regional and national political strategies support the advancement of a regional flagship?

3. Is the region/municipality currently an appealing location and is it possible to enhance its appeal? What is the situation regarding availability of qualified labour?

4. Are the comparative advantages that exist in the region/municipality clear?

5. Are there established structures and forms for cross-border/interdisciplinary collaboration (the business community, academia, the public sector, civil society, and between sectors, industries and areas of expertise)?

6. Does the political leadership prioritise and expect innovation in its own operations – as well as in the surrounding local and business communities?

7. Are there processes and structures that support innovation?

   a. Is there a permissive culture that encourages employees and managers to test and develop concepts and approaches?

   b. Are there structures and processes in place that facilitate continuous learning?

Managers in the business community can ask themselves the following questions in order to ensure that they are well prepared and to boost their capacity.

1. Does the management prioritise and expect innovation in the organisation and jointly with collaborating organisations?

2. Are there supporting processes and structures for innovation integrated into the operation?

   a. Is there a permissive culture that encourages employees and managers to test and develop concepts and approaches?

   b. Are there structures and processes in place that facilitate continuous learning?

3. Is the company familiar with local/regional strategies and innovation agendas? Is the company connected to the regional innovation ecosystem?

4. Is there clear leadership within the company?

5. Does the company conduct risk analysis of potential investments?

6. Are there established structures and forms for cross-border/ interdisciplinary collaboration?

   a. Is working in new constellations outside the company encouraged, e.g in new ecosystems to develop system innovation?

7. Is there a supply of relevant skills in the region?

8. Is there an interest in participating in the development of the location/region?

**Criteria for self-evaluation and assessment of a flagship**

The final part of the framework consists of criteria that should be fulfilled to a certain degree in order to enable a project or an innovation to be defined as a regional flagship. For each criterion there is a question that can be used by a regional authority, project owner or funder to assess the degree to which the condition is met.

The questionnaire can be used for self-evaluation by a project owner or as an assessment tool by a funder.

The questions should be answered on a scale of 1–5 with an accompanying justification for the estimate. The purpose of the questionnaire is to gain insight into the extent that a project can be considered a regional flagship. It also clarifies the project or initiative's strengths and which areas might need development.

Area	Kriterier/faktorer	Frågor för skattning och bedömning
Regional prerequisites	Nationella visioner, mål och strategier	To what extent is the project aligned with national visions, goals and strategies?
	Regional and municipal visions, goals and strategies	To what extent is the project aligned with regional and municipal visions, goals and strategies, e.g. RUS (regional development and collaboration in the work with Sweden's environmental goals) and the Smart Specialisation Strategy, NUTS regions?
	Buy-in	To what extent has project buy-in been established with decision-makers in politics, the business community and the public sector?
	Comparative advantages and strengths in trades and industries	To what extent has project development been based on a particular strength in regional trades and/or industries?
	Comparative advantages in the municipality, the region and/or nationally	To what extent has project development been based on a regional strength, skill or asset?
	Appeal and Site Development	To what extent does the project work with services, appeal, the hospitality industry or industrial development?
Systems perspective	Relevant stakeholders with the right skills	To what extent has an analysis of necessary skills been conducted?
		Are there strategies for skills provision?
		To what degree has the project been analysed from a systems perspective in order to map which perspectives/skills will be crucial for achieving success in system transformation?
	Cultures, norms and values	To what extent has analysis been conducted of how prevailing (1) cultures (2) norms (3) values might hamper/advance project implementation?
	Involvement of needs owners	To what extent has analysis been conducted of the recipients' need for the project? To what extent are affected stakeholders equipped to accept the project?
	Infrastructure and production systems	To what extent has analysis conducted of existing and necessary infrastructure that the project might be impacted by?
		To what extent has analysis been conducted of the production system in which the project operates?
	Appropriate technology and processes	To what extent has analysis been conducted of the project's technical solution/process?
	Scalability	To what extent has analysis been conducted of the project's potential scalability within and outside the region?
	Funding streams	To what extent has analysis been conducted of long-term, sustainable funding and business models that might hamper/advance the project?
	Regulations and permit processes	To what extent has analysis been conducted of the regulations, requirements and guidelines that facilitate/hamper the project?
	Cross-border, interdisciplinary collaboration	To what extent are there established processes for collaboration between different disciplines, sectors and industries?
	Leadership	To what extent is there explicit leadership in the project and its implementation?
	User involvement	To what extent is the project based on needs and involving affected users in project development?
Enabling approaches	Strong actors	To what extent have relevant actors been involved in the project?
		Has the project identified and mobilised individuals that are established in the region and that can support the project as ambassadors?
	Collective risk appetite	To what extent has the project mobilised stakeholders that are willing to take risks to bring about transformation?
	Multi-level collaboration	To what extent are there established processes for collaboration between different levels?
		Has the project mapped the project's critical decision points and what decisons need to be taken at local/regional/national level?
	Available innovation platforms	To what extent are innovation platforms available in the region?
	Environmental scanning	To what extent are similar projects in progress in the rest of the world? To what extent has analysis been conducted of the moment to introduce the project to the affected stakeholders?

Example of a spider chart showing the results from the criteria
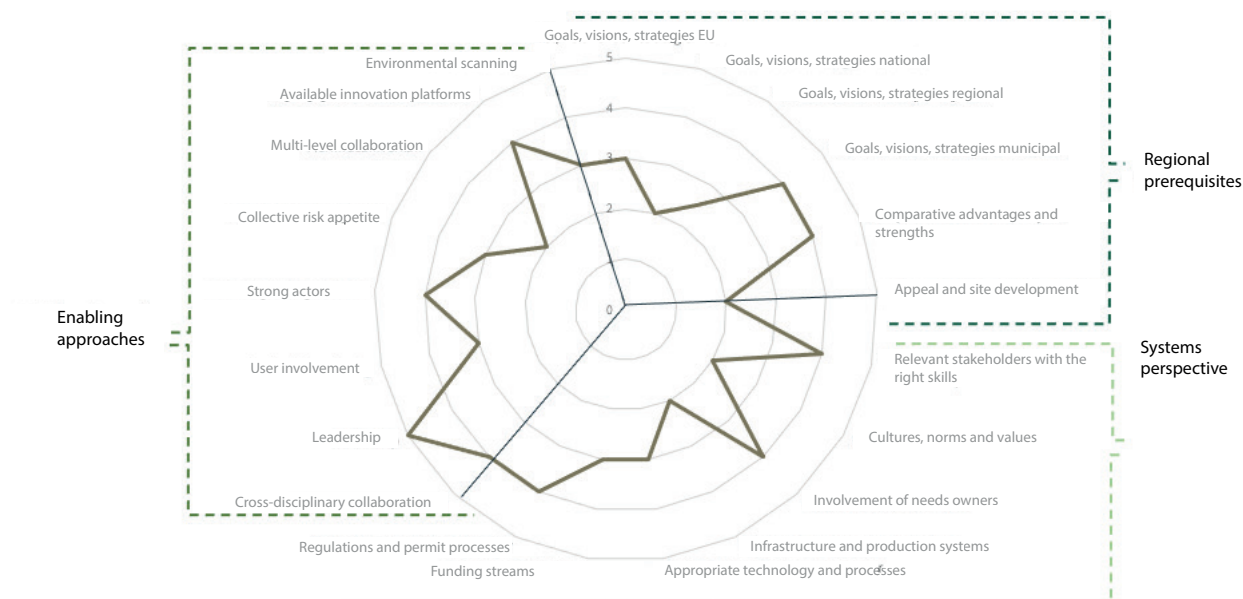
APPENDIX 3 REPRESENTATION ON THE ADVISORY BOARD

Table x. List of Advisory Board participants

Name	Title
Anders Carlsson	Co-ordinator at Linköping University and Process Manager at Visual Sweden
Angelica Ekholm	CEO, Dalarna Science Park
Ann Holmlid	County Director, Region Östergötland
Anna Björklou	CEO, Epishine
Christian Sahlén	CEO, ACTIA Nordic AB
Hans Holmström	CEO, Siemens Energy AB
Jessica Öberg	CEO, Combitech
Joakim Ljungqvist	Director of Business, Norrköping Municipality
Louise Felldin	Director of Business, Linköping Municipality
Louise Östlund	CEO, Kalmar Science Park
Malin Thunborg	Director of Regional Growth, Region Östergötland
Matts Nyman	CEO, BizMaker AB
Niklas Tideklev	Strategy Manager, Region Östergötland
Per-Olof Brehmer	Vice Chancellor for Collaboration and Campus Development, Linköping University
Sanna Detlefsen	Director, Östergötland City Mission
Charlotta Sund	CEO, Tekniska verken

APPENDIX 4 STUDY VISITS

The project's international trip took place on 5–7 July 2022 and included the cities of Rotterdam, Amsterdam, Brussels and Leuven. Below is a list of the organisations and the people we met.

Table x. List of people and organisations we met during the project's international study visit.

Name	Title	City
Frank Vieveen	Programme Manager at Smart Cities	Rotterdam
Jochem Cooiman	Innovation Officer & Vice Chair of KSF Eurocities	Rotterdam
Katelien van den Berge	Co-ordinator at Lighthouse & Energy Transition	Rotterdam
Albert Engels	Co-ordinator at Lighthouse	Rotterdam
Lennart Zwols	Representative from the Amsterdam Innovation Office and Project Manager for the ATELIER lighthouse project	Amsterdam
Karin Borst	Representative from the Amsterdam Office of European Affairs	Amsterdam
Yves Gigase	Head of programmes – Key Digital Technologies Joint Undertaking	Bryssel
Luciano Gaudio	Acting Head of the Communication Unit – Key Digital Technologies Joint Undertaking	Bryssel
Jan Paesen	Head of Leuven MindGate, an organisation that facilitates collaboration and innovation between all the active stakeholders in the Leuven Innovation Region	Leuven
Han Vloeberghs	Economic and political advisor at the Municipality of Leuven	Leuven
Patricia Schoolmeesters	Head of Finance and Commercial Affairs at the Municipality of Leuven	Leuven
Katrien Rycken	Director of Leuven 2030, an initiative based on citizen dialogue whose aim is to make Leuven a climate city	Leuven
Lore Baeyens	Co-ordinator of SOM (Samen Onderwijs Maken), a network of teachers, education co-ordinators, teaching support staff and the City of Leuven whose aim is to reinforce education innovatively and ensure that every student is included and challenged to develop and maximise their own talents.	Leuven
Stijn Heizmann	Representative from Maakleerplek, a municipal site in a disused industrial area where Leuven companies, schools, artists and residents learn, create collaborate.	Leuven

The project's study trip to Skellefteå took place from 29–31 August 2022. Below is a list of the organisations and the people we met.

Table x. List of people and organisations we met during the project's national study visit.

Name	Title
Kristina Sundin Jonsson	Municipal Director at Skellefteå Municipality
Christoffer Svanberg	CEO, Node Pole
Roger Stighäll	Founder at North Kingdom
Pea Israelsson	Club Director at Skellefteå AIK 1997-2022
Åsa Wikberg Nilsson och Minna Euronen	Professor and PhD student at Luleå University of Technology
Johanna Granlund	Project Manager for Built Environment, Skellefteå Municipality
Sanna Orellano	Cluster Manager, Skellefteå Science City
David Degerfeldt	Programme Manager, Boliden
Jonas Lundström	Director of Business and Built Environment, Region Västerbotten
Seved Lycksell	Sustainable Skellefteå (Skellefteå Kraft)

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LINKÖPING SCIENCE PARK