



## A Start-up Firm's Greenfield Project of Building a New State-of-the-art Factory in Sweden

Ulrika Harlin

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# Abstract

## **A Start-up Firm's Greenfield Project of Building a New State-of-the-art Factory in Sweden**

A unique greenfield project within a new industrial domain in Europe started 2017, with a mission to build the world's greenest batteries, to enable and accelerate the European transition to renewable energy. The new firm, together with Sweden's Innovation Agency Vinnova, initiated collaboration in the project "Research – new state-of-the-art factory", (VDr. 2017-03397). This report includes an executive summary and an extract of results. The research project specifically contributed to the initiation and knowledge related to the union collaboration process, aiming to support the establishment of a new state-of-the-art factory in a Swedish context. Relevant results identified during the start-up journey will serve as a contextual base and be used in agreement with the start-up firm in planned publications, i.e. they are not included in detail in this report. Furthermore, areas of development regarding concepts for work organization in the initial production organization have been identified, and initiated actions during the study contributing to operational work processes, and organizational learning.

**Key words:** Entrepreneurship, high-growth firm, sustainability, start-up, ecosystem, strategic network collaboration, electrification, transformation, union collaboration, social partners, production system, industrial work

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# 1 Executive summary

## *About the research project*

A unique greenfield project within a new industrial domain in Europe started 2017, with a mission to build the world's greenest batteries, to enable and accelerate the European transition to renewable energy. The start-up firm's project was unique in several ways and regarded as one of the largest industrial efforts in modern Swedish history. The new firm, together with Sweden's Innovation Agency Vinnova, initiated collaboration in the project "Research – new state-of-the-art factory", (VDr. 2017-03397).

## *Case study*

A longitudinal study was carried out for 30 months during the first three years of the new firm's start-up. The start-up firm had dedicated ambitions to achieve their mission with understanding of the need to manage extreme complexity at a very fast pace, with many parallel work processes, while the organization needed to grow dynamically. The overall aim of the study was to follow up events and actions in the fast-moving environment and derive key learnings from an industrial establishment perspective. Prioritized areas were identified by the project's steering group (with representatives from the start-up firm, Vinnova and RISE), which were crucial for enabling relevant studies, and results were continuously reported and approved by the project's steering group. The main part of the study focused on the start-up firm's collaboration with union organizations, and this was carried out with an interactive research approach. Issues regarding the company's approaches relating to growth, culture, competence, site selection, and circularity provided contextual understanding in the fast-growing new firm, where data was mainly collected through workplace observations and interviews. Delimitations, and not included in the study, were areas related to business development and programs, financial rounds, product development, technology, logistics, procurement, and production processes.

## *The start-up firm's overarching mission*

The start-up firm's overarching mission was clustered in the following vision points (describing approaches and the ambition of development of a greenfield project for a new industrial domain in Europe, starting in Sweden):

- Collaboration in strategic value chains → Optimizing processes and strategic partnership collaborations through vertical integration, cutting edge technologies, and advanced utilization of data
- "Going big from scratch" → Development of scalable concepts for the re-creation of more factories in Europe (circularity models, world class industrial workplaces, skill and competence ramp-up)
- "Sustainability without compromising" → Parallel focus and development strategic approaches for concept models for sustainable economic, ecological and social/human development
- Passion-driven and innovative 'we-culture' → High attention and strategic approaches to attract talents, build trust and a strong corporate culture using the company's core values – boldness, passion, excellence – that permeate the business

### *Outcomes*

The research project specifically contributed to the initiation and knowledge related to the union collaboration process, aiming to support the establishment of a new state-of-the-art factory in a Swedish context. In agreement with the start-up firm and Vinnova, results regarding the union collaboration, social sustainability dimensions and industrial establishment will further be elaborated for open publication in collaboration with RISE and HELIX Competence Centre/Linköping University, starting 2020. Relevant results identified during the startup-up journey will serve as a contextual base and be used in agreement with the start-up firm in planned publications, i.e. they are not included in detail in this summary. Furthermore, areas of development regarding concepts for work organization in the initial production organization have been identified, and initiated actions during the study contributing to operational work processes, and organizational learning. Also, relevant issues have been integrated at a generic level in a strategic roadmap project for Swedish industry as well as further R&D-needs serve as a base for spin-off research project applications.

### *Key learnings*

The following key learnings are derived from the initial phase of the start-up journey:

First, *the power of a shared overarching mission in strategic network collaborations*, far beyond the individuals', the company's or other partners' or stakeholders' own visions and missions. Utilization of cutting-edge technologies together with business-driven green approaches was a differentiating key factor in the company's strategy, increasingly crucial for attracting the start-up investors, partners and talents. Also, creating close strategic network collaborations with customers and suppliers sharing the overarching mission was another key for operationalizing innovative win-win solutions in value chains. This was carried out through vertical integration concepts, utilization of advanced data as well as mutual learning within the new industrial domain.

Second, the ability of *stretching targets through an entrepreneurial spirit combined with operational excellence* resulted in development of innovative solutions. The fast-growing multi-cultural organization was challenged daily in its parallel and inter-dependent work processes with constantly increasing complexity. However, with a strong entrepreneurial culture in the organization, many individuals and teams had a strong driving force aiming to "stretch the targets" and not accept "no for an answer". The competitive mindset regarding obstacles and hindrances was observed as a trigger and incentives to develop innovative solutions, thus increasing the possibilities to create unique competitive advantages.

Third, *transparency and inclusiveness*, including visualization of gains as well as challenges needing actions, were found beneficial. They contributed to achieving trust in the challenging fast-growing start-up, with major uncertainties and actions needed to be managed in parallel with strategic approaches. This also constituted unique learning opportunities, motivation, and team building. An inhouse enabler for building a strong team culture was a constantly clear, transparent, inclusive, supportive, and passion-driven management approach – daily "walking the talk". Also, transparency was crucial for fruitful collaboration with external partners, and others, and a success factor for issues requiring joint decision-making cross-organizations.

## 2 Appendix 1. Extract of findings

### 2.1 The start-up firm's initial start-up journey

The start-up firm was founded in 2016 with the mission to build the world's greenest battery cell: recyclable and with a minimal carbon footprint. The initial aim was to build a competence cluster within the energy and electrification domain in Europe, and production capacity in Europe for battery cell production. A thorough masterplan was developed based on a long-term strategy with strong ambition to become a key player for the acceleration of Europe's transition towards renewable energy. Challenging the Asian dominance within the battery field is crucial for industrial competitiveness and green transition in several sectors in Europe. Right from the start, the start-up planned to develop scalable concepts for the re-creation of additional factories in Europe. In order to be competitive, the battery cells needed to be produced on a large scale almost immediately.

The first step was to build a large-scale factory for lithium ion battery cells including active material preparation, cell assembly, recycling and auxiliaries. In parallel, an R&D centre and demonstration line for qualification and industrialization of products and processes together with customers was built and was also planned to be a concept model for the first large-scale battery cell factory. The strategy was to develop scalable concepts, including approaches for sustainability dimensions, which would be applicable for the re-creation of more factories in Europe. Hence, this start-up project was interesting from several industrial perspectives: the pace, scale, boldness, utilizing cutting edge technologies, managing parallel processes, building partnerships, innovative collaborations, company culture with a competitive spirit, and passion for their strong overarching mission – to make the world to a better place.

Even before the construction started of the large-scale battery factory, the order books were full for approximately five years ahead. Work processes focused on different development areas, such as business programmes, finance, cell design, production development, logistics, and talent acquisition. They were developed exponentially with increased complexity in a fast-moving pace. Clear targets and schedules for delivery of battery cells (based on customer deadlines and agreements) were communicated continuously, as well as success stories and obstacles requiring actions. After three years of the start-up firm's start-up journey, several milestones were achieved, see public data in the start-up firm's chronicles.

### 2.2 Challenges as drivers of innovations

The strong entrepreneurial mindset at the start-up firm was that every challenge was regarded as a potential competitive advantage. Difficulties, obstacles and problems were triggers and driving forces for creating innovative solutions. Societal challenges such as high labour costs and strict environmental requirements in Sweden were also strong drivers for innovations and the development of advanced technology solutions. Inhouse challenges were identified during the start-up phase, specifically concerning transparency across workstreams and merging many parallel work processes which were constantly expanding. Other challenges were related to the development of production

processes, machine and equipment procurement, materials, logistics, the fast growth pace, need of talents, the multi-cultural start-up environment, and sustainable working conditions. By breaking norms, and actively stretching targets, new cross-organizational collaborations generated exceptionally speedy environment permit processes and new business opportunities of waste.

Another challenge in the quickly expanding company was how to ensure efficient communication and transparency in all directions, both inhouse and externally. Specifically, several parallel production facilities were developed in Sweden along with a pilot plant for recycling, a production facility for battery modules and energy storage solutions in Poland, and another large-scale factory in Germany. This constituted in a dynamic development movement requiring major efforts for synchronizing. The clear, transparent, and passion-driven top management enabled short decision processes and stimulated development of passion-driven and bold teams, and team members. A question raised during the journey, was how to mirror the start-up firm's values with entrepreneurial mindset in the future organization, and how to combine stability with innovativeness, flexibility with structures, etc. During this period, the meeting structures needed to be developed to ensure transparency and support decision making in relation to other parallel activities in other work processes.

## 2.3 Teambuilding with 'we-culture'

There was major focus on the recruitment and onboarding process to find and attract people with the right skills, mindset and personality. Specifically, talents who would enjoy working for the company's overarching mission in a greenfield project characterized by a unique dynamic fast changing start-up environment. With a lack of human resources and competence in the region (as well as in Europe) within the business field, it was important to attract experts from all over the world as well as creating a work situation that would be beneficial in the long run. The issue of attracting talented employees within the technology domain to the company was very important. Strategic initiatives were also taken to work in partnership with other external organizations in society to find, attract and create collaboration with potential employees, currently outside the labor market.

As the number of staff grew to over 500 employees during the first three years and represented a broad range of nationalities (>50), culture and nationalities were major issues, also requiring an increasing attention of social dimensions. During the entire start-up period, the start-up firm worked actively with social factors related to employees' need for support to adjust to a new country and city. There were assigned resources to support issues regarding housing, schools, peer support activities in the company, language, etc. to create practical conditions as well as an innovative inclusive 'We-culture'. The company worked consciously with diversity and saw clear advantages such as door-openers for new partnerships, wider perspectives and development of new solutions in the start-up phase, but it was also a challenge that required constant attention. Striving for gender balance across the teams, management and the advisory board was considered carefully to create good dynamics for success.



The intention of the start-up firm was to develop a unique and strong company culture and proactively identify and handle potential obstacles along the growth journey – and transform challenges to competitive advantages, as previously mentioned. The notion of creating conditions for sustainable working life was considered in the early start-up phases. Along with focusing on employer branding and attracting the right competence, there were also reflections on the high workload and constant change of working conditions, due to the rapid growth and development of the company.

## 2.4 Union collaboration

An area of insight and knowledge creation was generated in a unique and early stage of collaboration with union parties with the purpose to strengthen the company's possibilities for a successful establishment in a Swedish context. The site in the middle of Sweden was of great importance and would be a model of concept for the site for the large-scale factory in the north, which was being developed and estimated to have a requirement of 3000 employees. By building a union collaboration structure in these early phases, a proactive approach was founded. It had the potential to provide important contributions on a long-term basis to the success and competitiveness of the start-up firm as well as to develop a world class concept for future manufacturing sites.

The union collaboration process was initiated by this study, as there was a strong ambition in the start-up firm to create conditions for sustainable organizational development. During the journey, there was an increased attention to develop strategic approaches regarding social sustainability dimensions, in parallel with economic and ecological areas. The union collaboration started officially in 2018, when a process leader, an expert within labor market collaboration and structures, was assigned by the top management. The first step was an anchoring process of top management of trade unions at a national level together with top management and project team in the start-up firm.

A 'Purpose of declaration' was formulated for co-operation between the start-up firm and union parties to create appropriate conditions for development of the best industrial workplace of the future demonstrating flexibility, power of innovation and excellent manufacturing results. Further, in the fall 2019, the collaboration process was established with local union parties in the two regions for factory establishment. At this point the collaboration had resulted in a first collective agreement at the start-up firm's test and demonstration factory for qualification and industrialization of products and processes. The agreement was development oriented and flexible according to the actual needs in the fast-growing and demanding work during the start-up phase.

At the time of writing this summary, further actions were planned for integration of issues developed in the union collaboration in other operational activities in the company's processes, e.g. in training, introduction, leadership development at the start-up firm. Further, discussions were held to develop the union collaboration process in an annual cycle. Key learnings from the union collaboration are planned to be utilized in the development of a global concept model for union collaboration in further recreation of battery factories in Europe.

## 2.5 Site selection process

An investment in new industry and large-scale manufacturing facility with a demanding time schedule is a huge opportunity, but also a major challenge for a region. The reactions from municipalities (representatives of finally selected sites as well as sites not chosen) were positive to the start-up firm's site selection process and shared spin-off effects based on lessons learned. Many highlighted means of the overarching goal, that Sweden was chosen for this greenfield project for industrial establishment and could see beneficial effects across municipal boundaries. Examples of lessons learned and spin-offs were identified in the municipalities through their participation in the start-up firm's site selection process:

- + development of strategies for growth within the region and going beyond benchmarking,
- + development of work organization within the municipalities such as “reversed crisis management”, a positive rapid decision-making spiral,
- + creating trust and customer satisfaction by solution-oriented approaches,
- + responding by going beyond the startup firm's requirements and questions,
- + increased structured collaborations across municipalities,
- + improvement of site readiness processes,
- + mutual competence development within the new domain and for efficient collaboration with a potential industrial start-up investor,
- + means and benefits due to the transparent site-selection approach that was applied.

## 2.6 SWOT extracts

### **Strengths derived from SWOT**

*(extracts of the start-up firm's enablers to achieve vision points)*

- + Vision- and passion-driven transparent leadership – Top management trust with clear targets and thorough business plan.
- + Talented people with a passion to contribute to a higher purpose than the company's actual core business. Control throughout the chain through vertical integration and eco-system collaboration.
- + Strong ambition to build right from scratch, with sustainable scalable concepts and cutting-edge technologies.
- + Entrepreneurial culture – Turning challenges to competitive advantages and stretching the targets.
- + Partnering up with people and organizations (including customers and suppliers) in a strategic value chain, developing solutions to the next level.
- + ‘We-culture’ with cross-collaborating teamwork across borders – constantly, everyday – “switching tables” working supportively towards a joint mission.
- + Strategic, structured, inclusive recruitment and onboarding processes.
- + Green sustainability profile increasingly attractive for investors, customers and talents.

**Opportunities derived from SWOT**

*(extracts of favourable external factors)*

- + Climate awareness and the green company profile strengthening the company's and partnership's branding during the start-up journey.
- + The growing movement of sustainable and responsible investments was regarded as advantages for the start-up firm and a unique selling point for potential investors.
- + Potential for establishment of Asian raw material suppliers in Europe.
- + Collaboration towards joint and overarching vision resulting in branding and goodwill benefits for all.
- + Innovative circularity solutions and concept development in Europe.
- + Increased job opportunities and integration of new arrivals into the labour market.
- + Increased competence and network collaboration within the battery domain on a local, regional, national and European level.

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RISE Research Institutes of Sweden AB  
Box 857, SE-501 15 BORÅS, Sweden  
Telephone: +46 10 516 50 00  
E-mail: [info@ri.se](mailto:info@ri.se), Internet: [www.ri.se](http://www.ri.se)

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