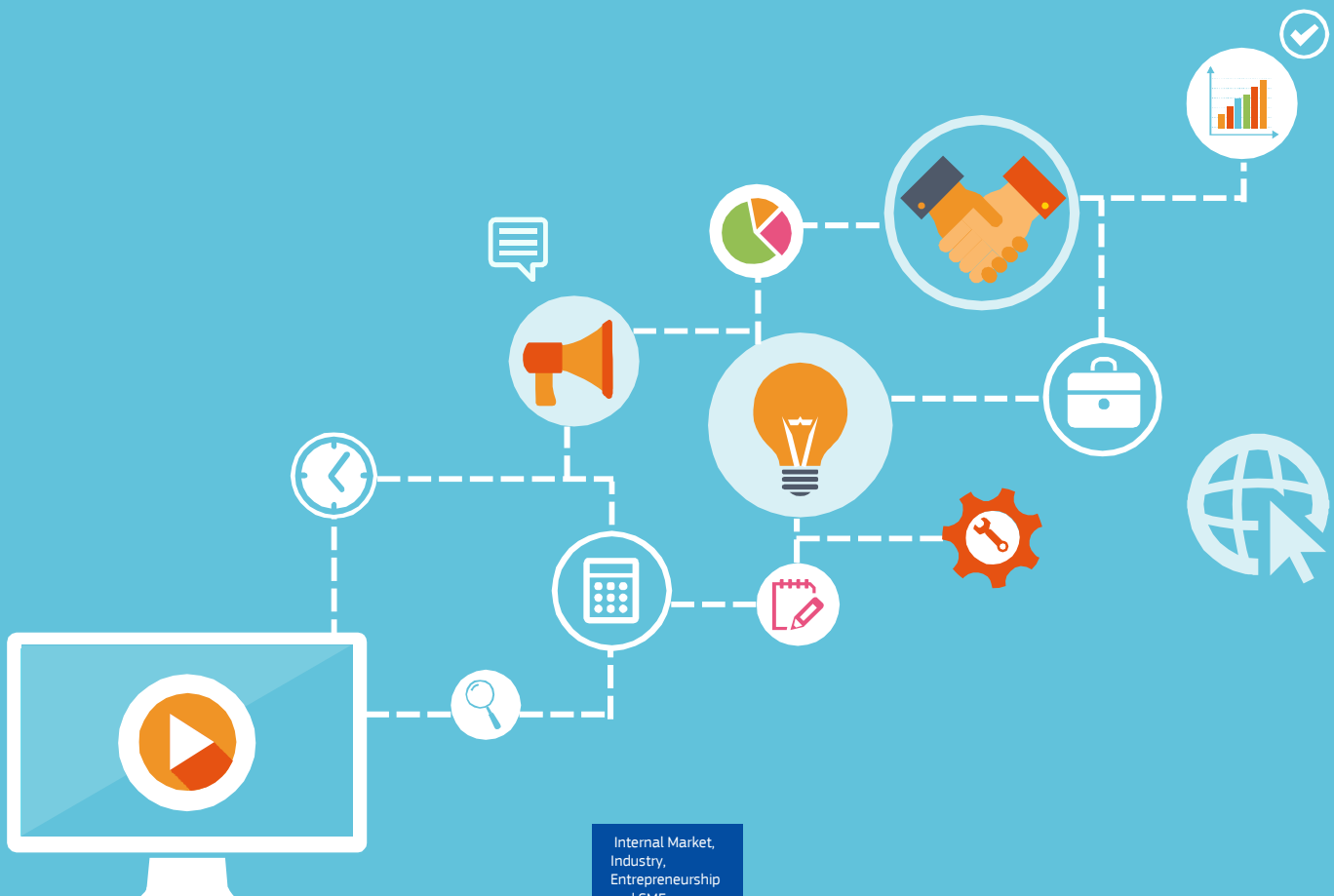
European Commission

Digital Transformation Monitor

Sweden: Produktion 2030

January 2017



Internal Market, Industry, Entrepreneurship and SMEs

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Sweden: Produktion2030

Fact box for Sweden's Produktion 2030 initiative	
Policy Lever(s)	A bottom-up driven platform run by participating stakeholders
Funding Model	Public funding and co-financing from industry with industry typically required to finance around 50% of project costs in research projects
Target audience(s)	Research institutes, universities and companies / SMEs from industry and service fields
Impact & Focus Areas	Sustainable production and delivery as well as flexible, integrated and human-centered production development
Key drivers	Strong collaboration base among industry and research stakeholders and VINNOVA funding
Key barriers	Changing cooperation patterns and involving SMEs
Implementation strategy	Bottom-up approach for roll-out and operation
Results achieved	Funded 30 projects, involved over 150 businesses, set up a PhD school and obtained 50% industry co-financing for every activity and instrument
Budget	€25 million offered by VINNOVA for 2013-2018 period complemented by approx. €25 million from industry
Uniqueness factor	The P2030 platform is based on a bottom-up approach that is driven almost entirely by industry and research stakeholders with an emphasis on innovation, research and industrial challenges in production
Value-added for policy-makers	The Industrial leadership of the platform together with significant private sector co-financing ensures industrial impact and long-term sustainability
Expected Impact	Strategic long-term efforts help Sweden to achieve a leading competitive position in the identified areas of strength and to address future investments in digital and sustainable manufacturing

Source Digital Transformation Monitor

An innovation programme for sustainable and competitive production

"Produktion2030" (P2030) was established in 2013 as a strategic research and innovation programme. It aims to make Sweden a frontrunner in investments in sustainable production by 2030. P2030 works as a public-private partnership platform and infrastructure built on collaboration between industry, academia and research associations.

It applies a structure with two main dimensions, respectively six areas of strength and five instruments covering project financing, knowledge transfer, staff mobility, education and internationalisation. P2030 has a basis in the research agenda Made in Sweden 2030 [1], developed by Teknikföretagen, the Association of Swedish Engineering Industries, with support from research and industry partners. P2030 is funded by VINNOVA, Sweden's innovation agency, and industry.

Industry and research stakeholders have shown considerable interest in being involved in P2030's operation and activities, including in offering co-financing. The five connected instruments, a collaboration platform and a bottom-up approach for roll-out are deemed vital for the success of P2030. It has however been challenging to find a balance between larger and smaller companies' priorities and to involve SMEs.

Since it was the first time Teknikföretagen ran a programme office in this type of programme, they also faced a few hurdles during the early stages.

A digital transformation agenda

Production industry and related services employ around one million workers in Sweden. Swedish companies are however faced with a major transformation pressure through fierce competition, megatrends, societal challenges and new advanced manufacturing opportunities.

In order to remain competitive at the global level, renewed efforts are needed to improve basic research, education and the testing of new technologies. As a key factor for export and jobs, the government has sought to promote digital transformation through a number of initiatives. The government has recently developed a strategy for new industrialisation[2] and it has further commissioned VINNOVA to push forward a digitalisation of businesses and industries.

VINNOVA has supported the launch of the innovation agenda Made in Sweden 2030 that aims to give Sweden a lead in sustainable and innovative manufacturing and services. Teknikföretagen presented the agenda in 2012, which was developed together with the Swedish Production Academy, representing ten universities, Swerea IVF, an industry research group, and IF Metall, an industrial trade union.

These actors had also prepared the two previous research agendas that formed the background for the Made in Sweden 2030 agenda. VINNOVA launched P2030 in 2013 as an instrument to achieve the Made in Sweden 2030 agenda [3]. It is one of 16-17 innovation programmes from VINNOVA. The scope for digital uptake is shared with programmes such as Internet of Things Sweden and Process Industrial IT and Automation that can collaborate with P2030 on calls etc.

Achieving several policy objectives

P2030's objectives are multi-fold. It aims through strategic long-term efforts to modernise Sweden's industry base, to make it the primary choice for sustainable production and customised, high-end industrial services, to upskill the workforce and to facilitate investments in production R&D. These achievements are expected by VINNOVA and participating stakeholders to help ensure job growth and long-term competitiveness of Swedish industry.

"We are in the middle of the 4th industrial revolution (…). The competition is getting tougher, but automation and the development of smart factories also make it more attractive to produce in Sweden."
– Mikael Damberg, Minister for Enterprise and Innovation

Policy levers for Sweden's Produktion 2030

Source Digital Transformation Monitor

A bottom-up approach for innovation

P2030 uses a bottom-up approach for implementation where industry, academia and research groups have responsibility for its design and operation. P2030 is run by stakeholders but in cooperation with VINNOVA that funds the initiative.

However, to strengthen the bottom-up logic, P2030 also relies on significant industry co-financing. P2030 concentrates on a variety of focus areas: it seeks to support the uptake of innovative technology and advanced manufacturing practices in businesses and to improve production education.

P2030 backed by public funding

VINNOVA has invested €25 million in P2030 during the 2013-2018 period. This is supported by approx. 50% industry co-financing, making a total of €50 million available for P2030 until 2018. The budget for the initial three calls for proposals amounted each to around €2.7, €2.2 and €0.9 million. P2030's fourth call has a budget of over €3 million and a total project budget of €0.5-1.0 million that includes co-financing [4].

While the rules for financing are outlined for each call, public funding can go up to 100% in a few projects. SMEs are able to receive a higher-level of public funding, while projects that involve larger companies rely more on private investments.

VINNOVA is facing challenges with assessing the long-term effects of their investments in projects, including quantifying the private investment leverage ratio and changes in turnover. In this context, each funded project is required to submit a report to VINNOVA around one year after the project has ended.

The report addresses the implementation of the results and the findings' relevance for the company. They do however not report on payoffs, effects on turnover or investments within projects, although they can provide some indications. There are several reasons for this. First, the projects are typically about internal innovation, efficiency in companies and about lowering costs.

This means that the projects as such are not market-driven or focused on commercialisation. Moreover, the time-frame for projects are long-term, meaning that the outcomes typically involve long-term improvements to efficiency and processes.

VINNOVA is currently doing the first evaluation of P2030 on the basis of the initial 3 years. While the ongoing evaluation is not expected to explore the effects of the investments for companies, the next evaluation, which will be undertaken after 6 years, may cover the results gained on the bottom line on turnover etc.

Industry co-financing in P2030 activities

P2030 is classified as a partnership programme by VINNOVA, which entails two important conditions with relevance for private funding of P2030's activities. First, there is an overall goal of at least 50% co-financing from companies. Second, the project consortium signs a consortia agreement that require all consortia partners to share results equally.

This means that a participating university will have the same ownership of the projects findings as a company partner. Turning to the funding of research projects, it is required that companies typically cover at least 50 %. To date, industry has invested approx. €9.5 million in research projects under P2030. The funding for knowledge transfer, mobility and education activities is rather limited.

However, VINNOVA and the P2030 stakeholders still expect high impact. The activities are selected by companies and research stakeholders themselves, according to their needs, in order to address current gaps and to ensure effective investments. For example, the funding of education activities is considered well spent and with a potential to have great impact through improving skill-sets and providing companies with the required qualifications.

A platform with five main instruments

P2030 comprises five instruments: financing of research and innovation projects, knowledge transfer, education, mobility and internationalisation. The first and largest tool, the financing of projects, targets concepts, methods and prototypes with market potential, often leading to test-beds and demonstrations. P2030 has launched four calls to date.

The first (2014) and second (2015) calls targeted P2030's six areas of strength. The third call (2015) focussed on digitalisation concepts for industry. The current call (2016) concentrates on production methods and technologies. The projects are evaluated by independent experts on the basis of criteria for market potential, feasibility, etc.

The second instrument seeks to transfer knowledge and technology to SMEs. This is pursued through a dissemination of research findings and methods, including from P2030 funded projects. P2030 incentivises its projects to re-package and tailor its findings for target groups and it cooperates with SME clusters and regional industrial development and competence centres for dissemination.

The third instrument sets up a PhD school in production and develops courses at master's level and for continuous education. It also seeks to promote university networking and the inter-exchange of researchers.

As a fourth instrument, P2030 supports mobility within funded projects, in order to help integrate reseach results into company practices. It funds staff exchange between industry and university and exchange programmes for showcasing technology.

The fifth tool, internationalisation, concerns integrating P2030 stakeholders' priorities in European platforms and research programmes and to support them in accessing European funded projects.

P2030 is a member of Manufuture and EFFRA and work with the KICs. One person is based in Brussels to promote Swedish production interests and to scan funding opportunities.

Fostering collaboration and dialogue

All interested members from society are in principle able to engage in P2030. Besides large companies and research institutes, innovative SMEs ("early adopters") make up a key target group for P2030, which considered it vital that SMEs engage more in research and innovation.

On the funding level, the calls cover companies, research institutes and universities that possess the capacity and interest to address P2030's objectives. Lastly, P2030 aims to attract students and younger generations, in order to provide an ample supply of qualified workers and researchers, which is imperative for the sustainability of production companies' operations.

Concepts and focus areas - six areas of strength as a starting point

The starting point of P2030 is the six areas of strength where Sweden has a solid position globally, but where continuous efforts are needed to remain competitive and to address skill gaps.

The areas of strength (or concepts) promoted are sustainable production, flexible manufacturing processes, virtual production, human-centered production, product and production-based services, and integrated production and production development.

The sustainable production area has so far received most attention. VINNOVA consulted stakeholders through workshops, questionnaires and meetings to select the focus areas. AB Volvo, SKF, ABB, Sandvik and Saab for example contributed to this process.

A strong collaboration base

Three enablers have in particular supported P2030's roll out. While VINNOVA is funding around 16-17 innovation programmes, P2030 was adopted as the first. This alludes to a strong collaboration base among production industry, research and society at large as well as a consensus about the need to push forward P2030's objectives.

The stakeholders are used to cooperate in product development, research agendas and programmes. Together with strengths in research infrastructure, the base for collaboration worked as an enabler for P2030. The second driver behind P2030's implementation relates to Teknikföretagen and its partners effort to shape the Made in Sweden 2030 Agenda and in managing P2030. Thirdly, VINNOVA's financing has further attracted companies and helped put P2030 into practice.

P2030's strategical background

The Made in Sweden 2030 agenda[5] serves as a conceptual framework and application background for P2030, thereby defining its scope and design. It outlines visions, the state of things and a roadmap for actions and investments.

Turning to P2030, VINNOVA has given stakeholders a key role in managing its innovation programmes (including P2030). The design has a basis in a bottom-up approach: it takes point of departure in industry needs, focussed on the instruments and areas of strengths. It is considered that industrial leadership and the level of stakeholder involvement would have been hard to achieve without a bottom-up approach.

Strategy development and operation are almost fully outsourced to participating stakeholders. They even write call texts and decide on project portfolio, which is rather unusual for this programme type, since it is normally conducted by VINNOVA.

Achieved results / outputs during 2013-2016 for Produktion 2030[7]

Financing of projects	• Funded 30 projects (hereof 12 digitalisation projects) involving 150 companies and 50 research institutes • Industry investment of approx. €9.5 million
Knowledge transfer	• Creation of around 20 SME events yearly • Cluster mapping and cooperation with SME-clusters
Education	• Established a PhD school; 130 students enrolled and 30 PhD courses launched
Mobility	• Started 5 mobility projects; increased project mobility
Internationalisation	• Involvement in EU-wide platforms; guiding and supporting stakeholders on EU-funding

Source Digital Transformation Monitor

A stakeholder-driven partnership

P2030 is implemented through its instruments that facilitate the organisational infrastructure. VINNOVA's role broadly relates to funding, decisions on projects to finance and assessment of P2030, which is carried out every three years. The collaboration between VINNOVA and P2030 also ensures quality assurance.[6] Teknikföretagen, representing 3800 member companies and approx. half of Swedish exports, coordinates P2030 in cooperation with partners.

Several groups help to implement P2030. P2030's programme office is run by a manager and deputy manager to ensure coordination. Each instrument also has a designated management group that reports to the programme office. The programme's steering committee is made up of ten-twelve representatives that make the official decisions on overall direction, instruments and project portfolio.

The committee is supported by the research and innovation council that e.g. prepares action plans and call texts. The council is led by ten-fifteen people - typically head of operations. There are also open and cross-sectoral expert groups to cover each area of strength.

The groups form communities for national interest in production. The expert groups meet at least biannually and develop material and input for calls, suggest visions and propose initiatives. One or two young academia researchers leads each group. This supports long-term collaboration, since it provides the young leaders, who are likely to become institute or department directors, with a network and linkages to industry.

Addressing a diversity of business needs

The diversity of sectors, companies and needs represent a key challenge for P2030. First, it is central to distinguish between larger and smaller companies. The larger ones typically have a stronger international footing when it comes to investment and financing sources. It therefore often requires a strong selling point to persuade them to get involved in P2030 and to invest in Sweden, rather than Asia, US, etc.

Second, SMEs are not heterogeneous actors, but a diverse set of companies with different capabilities in applying research results, which requires information to be packaged to different SMEs.

While larger companies are familiar with the process of obtaining financing, SMEs need more support on funding applications. Third, it was the first time Teknikföretagen ran a programme office from its own premises in this type of programme, presenting some early challenges for P2030 to get off the ground.

Teknikföretagen quickly got accustomed to its coordination role and was preferred for this role because of its broad member-base, knowledge on digital transformation, outreach capabilities and relationships with key members.

Significant backing by industry funding

P2030 has so far been successful in involving stakeholders, both in the platform and instruments. This can be reflected by the high number of participants and the level of co-financing. After two years of operation, every instrument and activity launched is backed by at least 50 % industry co-funding. Around 200 experts have volunteered to participate in the expert groups (without pay) to contribute to the implementation of P2030.

VINNOVA is currently evaluating its innovation programmes and some indications of this work are expected by the end of 2016.

SWOT Matrix for Sweden's Produktion 2030

Strength	Weaknesses
• Considerable interest and co-financing from industry • Connectedness and impact of P2030's five instruments	• Balancing between small and larger companies' interest
Opportunities	**Threats**
• Scaling up production school at the Nordic-level • The empowerment of young researchers offers transferability	• Maintaining larger companies' interest to invest in Sweden Addressing heterogeneity of SMEs

Source Digital Transformation Monitor

Achieving scale and sustainability

P2030's scope, which covers the entire manufacturing sector, has been scaled up compared to previous initiatives. It could thus be considered to have a more solid footing for encouraging investments in this field. In terms of further scalability, discussions are ongoing with Nordic countries for scaling up the graduate school at the Nordic-level.

The empowerment of young researchers, for example by making them leaders of the expert groups, may also offer a potential for transferability.[8] The same applies to the implementation strategy: it comprises a bottom-up approach that gives key responsibility to stakeholders and significant backing of industry funding.

This gives P2030 a long-term sustainability, makes it well positioned to address actual industry needs and helps the organisation, which basically works as a partnership of industry, research institutes and academia, to induce new partnerships through funding and instruments.

Pushed forward by industrial leadership

P2030's areas of strength are linked to the focus areas of EFFRA and P2030 also picked up a few ideas on concepts from the Finnish SHOK programmes. However, it was decided to adapt the implementation approach for P2030 by using a bottom-up approach that makes the programme reliant on stakeholders for roll out.

The role of the steering committee, expert groups and implementing partners ensures industrial leadership and engagement. Overall, the composition of the instruments, areas of strength and a collaboration platform has been deemed vital for progress and innovation in P2030.

Another lesson learnt relates to Teknikföretagen's hosting of the programme office. The organisation faced some initial hurdles, for example because it sought to take the many different views from its broad member-base into account. They solved this by giving a higher emphasis to larger companies, to speed up decision-making and implementation.

References

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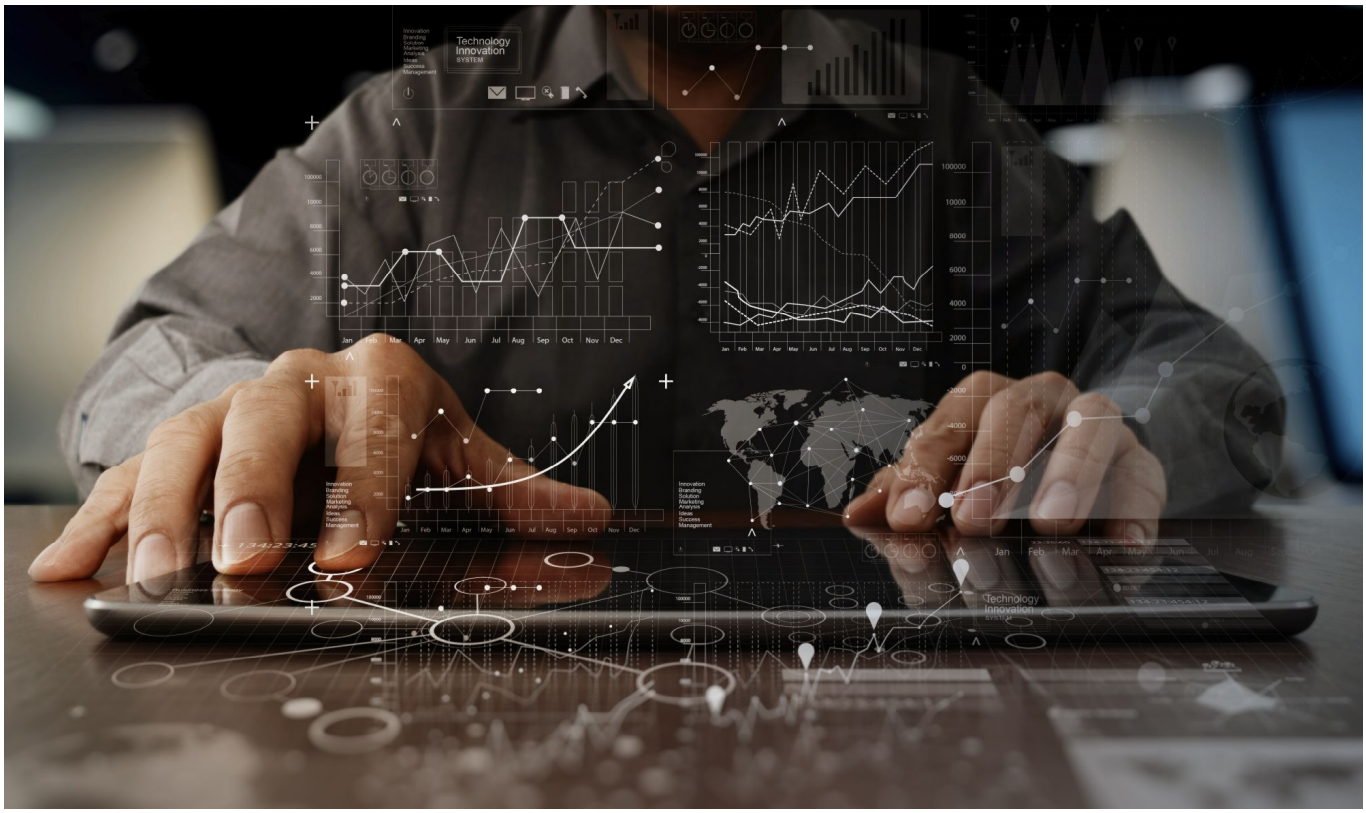
[8] Warrol, C., Prodution2030 – Vision: In 2030 Sweden is the primary choice for sustainable production, presentation slide for Manufacture 2015 event, 23-24 November 2015



About the Digital Transformation Monitor

The Digital Transformation Monitor aims to foster the knowledge base on the state of play and evolution of digital transformation in Europe. The site provides a monitoring mechanism to examine key trends in digital transformation. It offers a unique insight into statistics and initiatives to support digital transformation, as well as reports on key industrial and technological opportunities, challenges and policy initiatives related to digital transformation.

Web page: https://ec.europa.eu/growth/tools-databases/dem/

This report was prepared for the European Commission, Directorate-General Internal Market, Industry, Entrepreneurship and SMEs; Directorate F: Innovation and Advanced Manufacturing; Unit F/3 KETs, Digital Manufacturing and Interoperability by the consortium composed of PwC, CARSA, IDATE and ESN, under the contract Digital Entrepreneurship Monitor (EASME/COSME/2014/004)

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