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Produktion2030 call number 15

Human-Centred Manufacturing –
Sustainable Work in the Manufacturing Industry

A call within the strategic innovation programme Produktion2030.

The strategic innovation programme Produktion2030 is part of **Vinnova's, the Swedish Energy Agency's and Formas' joint investment** in strategic innovation areas. The aim of the investment in strategic innovation areas is to create the conditions for international competitiveness and sustainable solutions to global societal challenges.

For more information about the programme, see www.produktion2030.se

Med stöd från
VINNOVA Sveriges innovationsmyndighet
Energimyndigheten
FORMAS
Strategiska innovations-program

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Revision history

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1 Produktion2030's call for proposals in summary

In this call, Produktion2030 focuses on Human-Centred Manufacturing. In many parts of manufacturing industry, there is a shortage of skilled and productive labour, which affects the companies' ability to compete. Future tasks, workplaces and tools should be based on people's abilities, augmenting them with technology to make jobs more attractive, productive, and socially sustainable. Industrial employees should also be given opportunities to contribute effectively to reduced climate impact.[1]

The impact goal of Produktion2030's 15th call is increased social sustainability in manufacturing industry. Simultaneously, the economic and climate sustainability of companies must be maintained or increased.

Future work-tasks and workplaces in manufacturing industry must offer as many people as possible the chance to work safely, efficiently, and with competence. Project proposals for this call are expected to be primarily technical and focused on augmenting human capabilities. Solutions should enable efficient work based on individuals' skills. Projects could propose technologies enabling rapid and work-related up-skilling, or tools to reduce a company's environmental impact. Any proposed technical solutions should include effective, safe interaction between humans and technology.

Proposals should describe research and innovation projects where the solutions show a Technology Readiness Level of 3 –6 (TRL). A TRL increase of 1-2 steps from the original baseline should be achieved during the project period. We would be happy to see that project results are tested, demonstrated, and validated in test beds, laboratory environments, or real industrial environments during the project period. Proposals should clearly describe expected short-term and long-term impacts of the project.

Projects should be carried out in close collaboration between industry, academia and institutes in order to quickly translate new knowledge from research to concrete applications in industry. A consortium must contain at least three companies from manufacturing industry (must be active in Sweden), at least one university (or Högskola) and at least one research institute. The maximum project time span is three years. A consortium can apply for a maximum of 5 million SEK. The maximum funding level is 50% of the eligible costs. The total budget for the call is approximately 27 million SEK.

[1] For more information see https://www.vinnova.se/en/m/sustainable-industry/

Schedule for the call

The call opens	22 February 2022
Last application date	25 April 2022
Preliminary decision date	2 June 2022
Project start no later than	20 June 2022
Project completion by	19 June 2025

Contact persons regarding the call's background, aim and effects:

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Contact person regarding the assessment process, legal issues and other questions about the content of the call:

Tero Stjernstoft, Programme and call manager at Vinnova, Phone: 08-473 32 96
Tero.stjernstoft@vinnova.se

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Anna.delin@vinnova.se

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Helena Claesson, administrator at Vinnova, Phone: 08-473 31 57
Helena.claesson@vinnova.se

Contact regarding the proposal service:

Vinnova's IT support:

Technical questions about your proposal in the application service portal (Intressentportalen), Phone: +46 (0)8-473 32 99, helpdesk@vinnova.se

Up-to-date information about the offer and a link to our application service portal is available at www.vinnova.se

2 What does Produktion2030 want to achieve with this call?

In this call, Produktion2030 focuses on Human-Centred Manufacturing. In many parts of manufacturing industry, there is a shortage of skilled and productive labour, which affects the companies' ability to compete. Future tasks, workplaces and tools should be based on people's abilities, augmenting them with technology to make jobs more attractive, productive, and socially sustainable. Industrial employees should also be given opportunities to contribute effectively to reduced climate impact.[2]

The impact goal of Produktion2030's 15th call is increased social sustainability in manufacturing industry. At the same time, economic and climate sustainability of companies should be maintained or increased. In this call we assume that human-centred and socially sustainable work gives employees a good base for creating increased productivity and reduced climate impact.

Figure 1. Three dimensions of sustainability

Future work-tasks and workplaces in manufacturing industry must offer as many people as possible the chance to work safely, efficiently, and with competence. Project proposals for this call are expected to be primarily technical and focused on augmenting human capabilities. Solutions should enable efficient work based on individuals' skills. Projects could propose technologies enabling rapid and work-related up-skilling, or tools to reduce a company's environmental impact. Any proposed technical solutions should include effective, safe interaction between humans and technology.

2.1 Background

The demographic shortage of young people in working age is becoming very problematic for European industry. At the same time, the group of older employees is increasing, people who may need both physical and cognitive support to perform their jobs efficiently. Long-term, if sustainable work positions

[2] For more information see https://www.vinnova.se/en/m/sustainable-industry/

that allow people to work longer in life are not available, it will lead to a deteriorating competitiveness for Swedish manufacturing companies.

Automation solutions, efficient collaboration between humans and robots, and better utilization of digitalisation can increase flexibility, productivity and safety. Older as well as younger employees often lack critical skills, placing demands on new technical systems for smart instructions, effective upskilling and effective follow-up systems. Further, human decision-making is likely to continue to be the single most important environmental impact factor. But climate-related decisions in the manufacturing industry are complex and increased human ability to change to reduce the industry's climate impact requires awareness, competence, and augmented decision-making capacity of all employees. Example enablers for reducing climate impact are solutions for data collection as well as knowledge and decision support throughout life cycles of product or production systems.

Proposals should describe research and innovation projects where the solutions show a Technology Readiness Level of 3 –6 (TRL). A TRL increase of 1-2 steps from the original baseline should be achieved during the project period. We would be happy to see that project results are tested, demonstrated, and validated in test beds, laboratory environments, or real industrial environments during the project period. Proposals should clearly describe expected short-term and long-term impacts of the project.

Projects should be carried out in close collaboration between industry, academia and institutes in order to quickly translate new knowledge from research to concrete applications in industry. A consortium must contain at least three companies from manufacturing industry (must be active in Sweden), at least one university (or Högskola) and at least one research institute. The maximum project time span is three years. A consortium can apply for a maximum of 5 million SEK. The maximum funding level is 50% of the eligible costs. The total budget for the call is approximately 27 million SEK.

Projects within Produktion2030 should create new solutions that contribute to the SDGs in agenda 2030[3]. The projects should contribute to gender equal development by ensuring that both women and men take part in grants in an equal way, that they have influence over the project and that they actively participate in the project's implementation and wide dissemination of results.

Produktion2030 has defined six industrial challenge areas. Proposals in this call should describe their project and its solutions in the context of one or more of these challenge areas. Chapter 4 provides examples of challenges and problems.

[3] https://en.wikipedia.org/wiki/Sustainable_Development_Goals Read more about Vinnova's work to contribute to the goals of Agenda 2030: https://www.vinnova.se/en/m/the-2030-agenda--a-key-driver-of-innovation/

3 Who is the call addressed to?

Produktion2030's 15th call is primarily intended for project consortia with actors within manufacturing industry, universities, and research institutes with focus on manufacturing. In this call we limit manufacturing to production processes, production systems, and enterprises where end manufacturing results are discrete products or units. [4]

To enable cross-project collaboration between approved projects, call 15 is not primarily intended for project consortia from continuous process industry, energy-producing industry, healthcare, service sectors or similar.

The project consortium must include at least three companies from the manufacturing industry (which must be active in Sweden, at least one university (or a higher education institution) and at least one research institute. Consortia are encouraged to engage Small and Medium-Sized industries in the consortium, but this is not a requirement.

All consortia shall contribute to equal social development by ensuring that both women and men take part in grants on an equal footing, have real influence over the project and participate clearly and actively in the project's implementation with substantial effort in a timely manner.

4 What is funded by Produktion2030?

Produktion2030 focuses on one or several of the programme's six industrial challenge areas (see Fig. 1). Research, innovation, and results from all challenge areas contribute to the programme's efforts to achieve the sustainability goals of the 2030 Agenda and the programme's other long- and short-term impact goals.[5]

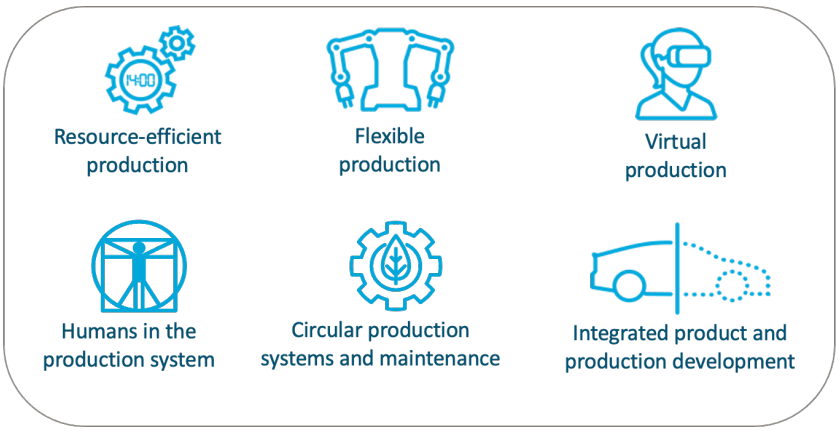

Fig. 2. Produktion2030's six industrial challenge areas.
For more information about the areas, see www.produktion2030.se

[4] https://en.wikipedia.org/wiki/Discrete_manufacturing
[5] http://produktion2030.se

4.1 Challenge Area 1 - Resource-efficient production

Example: Resource-efficient production is a requirement for manufacturing in high-cost countries as Sweden. How can resource consumption and environmental impact from production systems be minimized? How do production systems and employees become competitive, resource efficient, and competent? How is efficiency created in global and local production systems with long value-chains?

4.2 Challenge Area 2 - Flexible Production

Example: How are flexible value-chains, production systems, and manufacturing processes designed for rapidly changing customer demands without adversely affecting employees or climate? How can production flexibility requirements for volume and variant flexibility be matched? How does flexible automation, robot collaboration, and digitalisation enhance human flexibility?

4.3 Challenge Area 3 - Virtual Production

Example: How can data and information quickly be transformed into knowledge and decision support in virtual production systems and digital models of people, processes, factories, and value chains? How can we increase the digital maturity and digital transformation and companies through concepts such as Industry 4.0? How can digital twins of production systems, workplaces and people be used for visualization of climate effects and analysis of circularity or sustainable work?

4.4 Challenge Area 4 - The Human Being in the Production System

Example: How do you create good ergonomics, safety, productivity, and flexibility in a workplace? How can life-long learning and social sustainability be integrated into work? How can human abilities be augmented through decision support, instructions and smart technologies? How can increasing numbers of older people in the industry, be physically and cognitively supported? How can human-augmenting decision support to monitor and influence companies' climate impact be designed? How do humans collaborate with automation or robots?

4.5 Challenge Area 5 - Circular production systems and maintenance

Example: How does industrial manufacturing support circular production and how can people influence circularity? How can products, production systems, and business models be designed for circularity and remanufacturing? How is digitalization and decision support used to collect and analyse large amounts of data? Can maintenance extend the life of products and production systems? How is people's ability to reduce the climate impact of industry strengthened?

4.6 Challenge Area 6 - Integrated Product and Production Development

Example: How can smart technology for parallel product and production development strengthen people's capabilities to reduce climate impact? How does product development create value, resilience, and robustness for actors in a supply chain? How is the development process streamlined to meet new market requirements? How do smart product development decisions increase circularity and reuse of materials in value-chains? Does standardization reduce environmental impact?

5 Costs and funding

5.1 Conditions for received funding

Our funding is provided in the form of grants. Funding for organizations that operate economic activities is subject to regulations regarding state aid[6].
These regulations govern which costs and what proportion of these costs may be covered by the grant.
Universities, university colleges, research institutes and companies with a maximum of 49 employees can receive grants in this call. Which costs that are eligible and support levels for different parties in the project must comply with the GBER[7] regulation.
For universities, university colleges and institutes that do not perform financial activities, funding is not granted as state aid but in accordance with ordinance (2009:1101) with instructions for the Swedish innovation agency.

5.1 How much funding is available?

Maximum funding for research and innovation projects is SEK 5 million, with a maximum aid intensity of 50 percent of eligible costs. The following support levels apply to companies, universities, university colleges and research institutes. For research institutes, the term for the funding is that they participate in their non-financial activities.

Table 1. Aid intensities for different categories of project part in this call.

	Maximum number of employees	Maximum Turnover	Maximum support level
Small companies	Max 49 employees[5]	Max. 10 million euros	50 %
Larger companies	> 49 employees	-	0 %
Universities and Colleges	-	-	100 %
Research Institutes	-	-	100 %
Estimated aid intensity for the total project / consortium	-	-	50 %

More information about state aid is available on our website (in Swedish) at: https://www.vinnova.se/sok-finansiering/regler-for-finansiering/statligt-stod/. You will also find our general terms and conditions for our funding, as well as a guide to the terms and conditions governing eligible costs: https://www.vinnova.se/sok-finansiering/regler-for-finansiering/allmanna-villkor/

[7] Read more about state aid: https://www.vinnova.se/sok-finansiering/regler-for-finansiering/statligt-stod
https://www.vinnova.se/globalassets/huvudsajt/sok-finansiering/regler-och-villkor/dokument/eu-definition-smf.pdf

6 Prerequisites for assessment of the proposal

Vinnova will only evaluate proposals that meet the following formal eligibility requirements:

- The project must not have started before the proposal is submitted.
- A project consortium shall consist of:
  - at least three companies in the Swedish manufacturing industry that manufacture discrete products, of which at least two companies with production in Sweden
  - at least one actor from a university or college
  - at least one actor from a research institute
- The project partners must be legal entities.
- Companies, universities, or research institutes can be project coordinators.
- The project must be able to start no later than 20th of June 2022
- Project should be completed by the 19th of June 2025
- Proposal must be complete according to the instructions in chapter 9.
- **When the proposal is submitted, the project summary must also be sent to the program management of Produktion2030: cecilia.warrol@produktion2030.se**
- Vinnova's grant can amount to a maximum of 50 percent of eligibility costs for project. The project budget reported shall only include eligible costs, see section 5.2. Project costs that are not eligible must, however, appear in the project description as they may be important in the assessment.
- **Of the total project budget, minimum of 2 percent should be set aside for packaging and dissemination of project results outside the consortium,** for example as technology workshops and / or training / education modules. This must be clearly stated in the project description and budget summary.

If the above requirements are NOT met, the proposal will not be assessed but will be rejected on formal grounds, without further justification. Once the proposal deadline has passed, proposals may only be supplemented at Vinnova's request.

7 Assessment of proposals

A research and innovation project must have a clear focus on *one or more* of Produktion2030's challenge areas. This area must be stated in the project proposal.

Proposals are assessed on the basis of three main criteria:

1. Potential
2. Actors and consortium
3. Feasibility

7.1 How do we evaluate proposals?

Each proposal is assessed in competition with other submitted proposals and it is the electronic proposal submitted to Vinnova via Vinnova's application service portal (Intressentportalen) that will be assessed. An expert group of independent Swedish and international experts carries out the assessment.

The following criteria are used by the international evaluators to assess and rate all project proposals that meet the formal requirements. The grades are compared, and the highest ranked project proposals are financed. It is therefore a strong recommendation that you take all criteria into account.

Table 2. Criteria

		Criterium	Description
1.Potential	1.1	Impact goals	How well does the project contribute to the call's impact goals, a socially sustainable work?
	1.2	State-of-the-art	Does the proposal provide a relevant picture of the state of knowledge in the area?
	1.3	Level of research and originality	How high is the project's level of research excellence and originality?
	1.4	Industrial and societal benefit	How big is the project's industrial benefit and societal benefit?
2.Aktörer	2.1	Project consortium	How well does the project consortium's overall competence, project management, roles, and specified resource requirements match the goals of the project?
	2.2	Collaboration	How well does the proposal show how collaboration between the project parties is to be achieved, and that all parties participate on equal terms and with equal commitment?
	2.3	Gender equality actors	How well is the team composed in terms of gender distribution, as well as the distribution of power and influence between women and men?
3.Feasibility	3.1	Work packages, objectives and milestones	How realistic is the project plan, budget and project goals?
	3.2	Risk analysis	How clear is the proposal's risk analysis? Are risks clearly identified and are activities for managing risks clearly described?
	3.3	Implementation and scalability	How well is the dissemination of results to partners inside the project consortium described?
	3.4	Dissemination of results	How well is the communication and the dissemination of results to stakeholders outside the project consortium described?
	3.5	Gender equality	How well are gender aspects described and integrated into the project plan?

7.2 The proposal and decision-making process is as follows:

1. Proposal shall be submitted via Vinnova's application service portal (Intressentportalen): https://portal.vinnova.se
2. Project summary shall be sent to the program management for Produktion2030: cecilia.warrol@produktion2030.se
3. Proposals meeting the formal requirements will be evaluated against the assessment criteria set out above. The evaluation will be done by specially appointed external evaluators (normally this means international experts in the field) who will give recommendations on which projects should be granted and which should be rejected.
4. Vinnova decides which projects are to be funded.
5. Decisions are notified to the applicant and the management of the strategic innovation program is informed of the outcome

8 Decisions and conditions

8.1 Vinnovas decision

How much each party in the project is granted is stated in the decision. The decisions for the granted funding are supported by Article 25 of the Commission Regulation No 651/2014 (GBER), industrial research and experimental development. The aid basis is stated in the decision and also governs which costs are eligible.

Vinnova's decision to grant or reject a proposal cannot be appealed.

8.2 Conditions for receiving funding

Vinnova´s general terms and conditions for grants apply to grants awarded.[8] The terms and conditions include regulations on project agreements, conditions for payment, follow-up, reporting and utilization of results. Scientific publication of results must made using open access in accordance with Vinnova's instructions.[9]

Since the call is made within the framework of strategic innovation programmes, the following special conditions also apply:

1. The project shall be represented by at least one project party at conferences and other activities organized under the strategic innovation programme Produktion2030.

[8] Current term can be found on Vinnova's website, together with help to understand and meet the conditions: https://www.vinnova.se/sok-finansiering/regler-for-finansiering/allmanna-villkor/

[9] https://vinatet.vinnova.se/contentassets/19d7ce8a36d243d499e2d7bd9840b80d/forslag-201109-vinnovas-anvisning-for-oppen-tillgang-till-vetenskapliga-publikationer.pdf

2. The project shall maintain a continuous dialogue with Produktions2030's program office and project support throughout the project's duration
3. The program office shall be given the opportunity to carry out a compulsory half-time reconciliation in which all project partners participate
4. Information about the project and publications of project results must state that the work was carried out within the strategic innovation programme Produktion2030, a joint effort by Vinnova, Formas and the Swedish Energy Agency.
5. At the same time as the project reports to Vinnova, a public summary of the project results must also be sent to Produktion2030 via e-mail Cecilia.warrol@produktion2030.se. The summary must be able to be distributed and published freely and must not contain confidential or sensitive information.
6. When presenting project results, Produktion2030's templates and logos must be used according to instructions from Produktion2030's programme office.
7. The coordinator shall provide information regarding the project summary, project manager and project consortium for publication at http://www.kunskapsformedlingen.se. Instructions and templates will be announced in close connection with the decision.
8. Of the total project budget, minimum of 2.5 percent shall be set aside in the form of packaging of project results for dissemination outside the consortium, for example in the form of technology workshops and / or training / further training modules.

Additional special conditions can be decided for individual project. Our recommendation is that the coordinator prepares the form for participant's approval well in advance of the project start [10]. If you do not follow Vinnova's term, you may be liable for repayment. This also applies if you have been granted funding incorrectly or with an excessive amount.

9 How to apply

To apply, please complete an online form in our application service portal (Intressentportalen), which can be accessed via portal.vinnova.se. There you shall also upload the following appendices[11]:

- Project description
- Project summary (public)
- CV Appendix

[10] Guide and forms can be found on Vinnova´s website: https://www.vinnova.se/sok-finansiering/regler-for-finansiering/allmanna-villkor/

[11] Templates for the attachments can be found on Vinnova´s website:: https://www.vinnova.se/e/strategiska-innovationsprogrammet-for-produktion-2030/sip-produktion2030-utlysning-14/

The appendices must be submitted in pdf format.

OBS! The proposal will be assessed by an international expert group, our recommendation is therefore to write a proposal in English.

- 1. The project description must include a maximum of 10 standing A4 pages with single-column 12-point black text in Times New Roman. References to information on web pages and the like will not be considered in assessment.

- 2. The project summary shall follow the template provided by the call. It may be a maximum of two pages and must be able to be published freely. The summary should therefore not contain confidential or otherwise sensitive information.

- In direct connection with submission of the proposal to Vinnova, the appendix Project Summary must also be sent to the program office for Produktion2030 via email to the address: cecilia.warrol@produktion2030.se. This step is mandatory for the proposal to be considered for assessment.

- 3. The CV appendix must contain relevant CVs for the project manager and all key people in the project team. Every CV must be on a maximum of 1 A4 page with 12-point text. *We recommend that active project participants participate at least 5% of full-time.*

All of the above appendices are mandatory, and templates provided by the call must be used. Deviating proposals will not be assessed.

Keep in mind that it takes time to make a proposal. You can start filling in information, save and continue later. When the proposal is ready, mark it as ready. You can unlock the proposal and make changes, right up to the last application day.

Prepare the proposal in good time before the call closes.

When the call is closed and the proposal registered with Vinnova, a confirmation will be sent by e-mail to you who are in charge of the user account, project manager and signatory / head of department. It may take a few hours before you receive the email.

If you have not received a confirmation by e-mail within 24 hours of the call closing, please contact us.

When the proposal period has expired, completion of the proposal can only take place at the request of Vinnova.

10 Who can read the proposal?

Proposals submitted to us are classified as public documents. However, we will not disclose any information about an individual's business or operating circumstances, inventions or research results if doing so could harm an individual.

Documents sent to the organization responsible for the strategic innovation programme are not subject to Vinnova's confidentiality rules.

11 Definitions of Technology Readiness Levels

Table 3. General definitions of Technology Readiness Levels[12])

TRL 1	Basic principles observed
TRL 2	Technology concept formulated
TRL 3	Experimental proof of concept
TRL 4	Technology validated in lab
TRL 5	Technology validated in relevant environment (industrially relevant environment in the case of key enabling technologies)
TRL 6	Technology demonstrated in relevant environment (industrially relevant environment in the case of key enabling technologies)
TRL 7	System prototype demonstration in operational environment
TRL 8	System complete and qualified
TRL 9	Actual system proven in operational environment (competitive manufacturing in the case of key enabling technologies; or in space)

[12] https://ec.europa.eu/research/participants/data/ref/h2020/wp/2014_2015/annexes/h2020-wp1415-annex-g-trl_en.pdf