

Innovation competition for sustainable plastic use

How do we shape a sustainable food system?

A cooperation during 2019 between Swedish EPA and
the strategic innovation programme RE:Source

SWEDISH ENVIRONMENTAL
PROTECTION AGENCY

Order

Phone: + 46 (0)8-505 933 40

E-mail: natur@cm.se

Address: Arkitektkopia AB, Box 110 93, SE-161 11 Bromma, Sweden

Internet: www.naturvardsverket.se/publikationer

The Swedish Environmental Protection Agency

Phone: + 46 (0)10-698 10 00

E-mail: registrator@naturvardsverket.se

Address: Naturvårdsverket, SE-106 48 Stockholm, Sweden

Internet: www.naturvardsverket.se

ISBN 978-91-620-6940-7

ISSN 0282-7298

© Naturvårdsverket 2020

Print: Arkitektkopia AB, Bromma 2020

Cover photos: Helena Lindblom



Preface

Innovations are needed to speed up efforts for a better environment and climate. Innovation competitions are a way for us to collaborate with multiple societal organisations to jointly work for greater progress.

With innovation competitions, we can take on major environmental challenges and, together with others, work to develop new solutions. An example of an environmental challenge is how to use plastic more resource-efficiently and in a way that preserves value so that it reduces environmental and climate impact. This innovation competition focuses on sustainable plastic use in the food sector. This is a complex system challenge that cannot be differentiated from food and health, which are therefore included in the competition challenge. The social and economic dimensions have been integrated into this effort. The competition has resulted in proposals for several new solutions and approaches. These are solutions that the agency and the various actors would otherwise have had difficulty in arriving at on their own.

We face huge challenges in achieving our vision of a good living environment both for people and for all plants and animals, now and for future generations. We all want to pass on to the next generation a society that has solved the major environmental problems without increasing environmental and health problems beyond Sweden's borders. To tackle major challenges, transformative solutions are needed in the form of revolutionary societal changes. This is why it is so important that we share our experience from innovation projects and inspire others to make the right kind of changes.

Stockholm 20 October 2020

Björn Risinger
Director General

Contents

PREFACE	3
SUMMARY	7
WHY HAVE AN INNOVATION COMPETITION?	9
THE TEAMS' SOLUTIONS	10
A policy tool to increase Sweden's self-sufficiency	10
Svea's Arena – an information-focused food supply system	12
The jury's motivation for the winning entry	13
THE COMPETITION	14
The format	14
Participants with broad competence	15
Inspiration and workshops	16
Authority group following the competition	16
Jury and assessment criteria	17
Evaluation of the project	17
ADDITIONAL ACTIVITIES	18
Report on circular economy	18
Workshop for university students	18
LESSONS LEARNED	21
FROM IDEA TO ACTION	23
REFERENCES	24

Summary

How do we tackle the major environmental challenges? One way to promote disruptive solutions is to initiate innovation competitions.

This competition is based on the problematic flow of plastic packaging, combined with the function of packaging in relation to food. We started from the challenge: How do we protect, transport, and communicate food in the future? And how do we do this while managing all other resources well? If we look at the Sustainable Development Goals, this challenge covers more than half of them.

The Swedish EPA, together with the strategic innovation programme RE:Source, has been running the competition with two teams. Each team has individuals with different skills and the team members represent both the public and private sectors. Both teams solutions and contributions are based on a more regional food supply and solutions that allow us to reduce the amount of plastic, packaging, and transport.

The winning entry is a conversion tool describing the principles for sustainable production and consumption of food at various levels. These levels cover the individual as a member of society, the local community, the region, and a national application.

The important work of turning the solutions into a reality remains. Future application of the results can include a collaboration with Vinnova and the National Food Administration on their mission “Nutrition and health” and on “A new recipe for sustainable school food”. The participants have taken back different parts of their work in the competition to their organisations and some have started collaborating in smaller constellations after the competition.

Why have an innovation competition?

An innovation competition is a way of encouraging making major progress in the challenges we face today. Big environmental challenges need transformative solutions.

An innovation competition gives a government agency like us the opportunity to define the direction of a change or a transformation that we want to see. More new solutions and innovations are needed for Sweden to achieve its environmental goals faster. A competition can help speed up the market introduction of new solutions.

The method also gives us an opportunity to empower others by engaging and bringing together people and stakeholders with different perspectives, needs, and skills. It allows us to engage and empower people to solve problems together.

This competition focuses on sustainable solutions for the future to provide nutrition and health in a society where plastic is a more valuable material than today. In the future, plastics will be produce, used, and reused in a circular fashion without negatively impacting health or the environment. Plastics will be used resource efficiently and in a way that preserves value.

The competition addresses both our food supply and the materials and resources needed and it is linked to more than half of the Sustainable Development Goals.

The purpose of the innovation competition was to create new visions and ideas for the role of plastics in the food supply of the future. The aim has been to generate ideas and suggestions for concrete activities that can contribute to faster change. The competition has also intended to create an interest in the challenges around nutrition and health for the competition participants and contribute by expanding their strategic network and with competence development.

The teams' solutions

Both teams in the competition came up with solutions based on a more regional food supply in a local, national, and global context. The solutions will reduce the amount of plastic, packaging, and transport, and result in proposals for changes in legislation.

A policy tool to increase Sweden's self-sufficiency

The Nutrition Resilience Map is a conversion tool that accelerates the transition to a local, resilient food production system. Through local and regional food supply, access to healthy food is optimised while enabling circular material flows.

The conversion tool is powerful in that it enables the establishment of a common agenda for decision makers in business, the public sector, and academia.



Figure 1. Simplified version of the Nutrition Resilience Map.

The concept describes basic principles for sustainable production and consumption of food. These design principles of permaculture are guiding principles. At the centre of the map is the individual who eats the food. The first four steps can increase the degree of self-sufficiency to 80 per cent.

- Zone 1. Grow your own
- Zone 2. Grow together
- Zone 3. Support local food producers
- Zone 4. Strive for regional self-sufficiency
- Zone 5. Interregional trade

Through the tool, we can create systems that radically reduce the need for plastic, such as packaging and long-distance transport. Instead of targeting the plastic as the single most important issue, the tool shows that a recast food supply system needs less plastic and transports. When we leave behind today's global food supply system, we reduce food waste, increase resource efficiency, and enable more local circular resource flows.

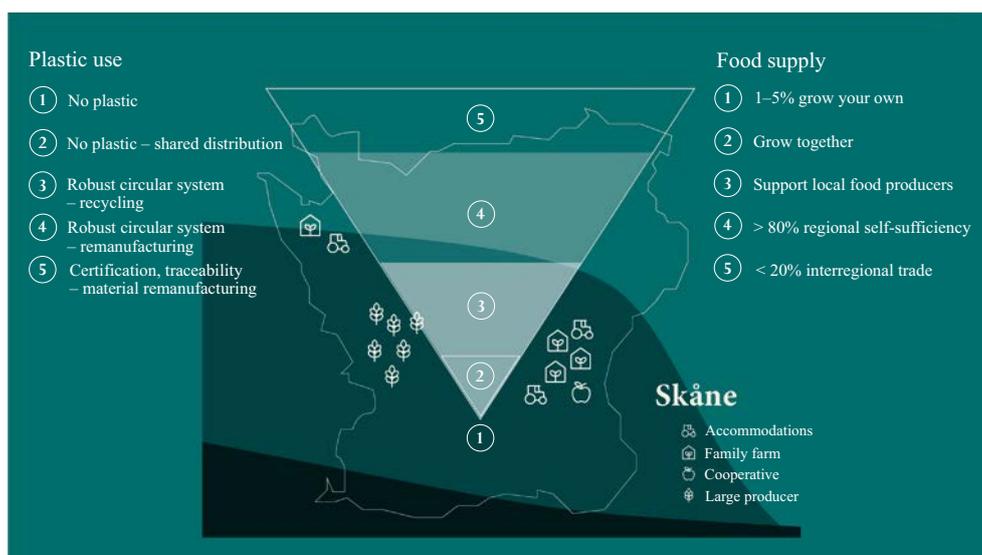


Figure 2. An example of how a changed food system can result in less plastic use.

The report¹ in Swedish is available from the Swedish EPA's website.

¹ <http://www.naturvardsverket.se/upload/miljoarbete-i-samhalltet/miljoarbete-i-sverige/innovation-for-miljomal/tavlingsbidrag-blue-team.pdf>

Svea's Arena – an information-focused food supply system

Svea's Arena consists of a combined physical store and neighbourhood restaurant, a logistics section, and an online store that together create a demand innovation for a sustainable food system. Where necessary, durable plastic packaging with associated recycling systems is used. The Arena is available in both a physical and virtual form.

The different parts are supported by interacting and transparent information platforms that communicate with each other and, more importantly, with all stakeholders, from agriculture and growers to consumers and everyone in between who are users. By having direct contact with many local producers, a social dimension is added between the food consumer and the producer.



Figure 3. Svea's Arena illustrated by Helena Lindholm.

The purpose is to eat well, eat healthy, and eat sustainable amounts of food within the planet's limitations. For this to become a reality, the Arena needs to be a central hub that is integrated with everything and everyone that makes sustainable food possible.

The Arena also strives:

- to open up online and retail offerings for local small-scale growers, meat producers, and food producers without excluding major sustainable producers and providers;
- to create a stronger connection between consumers, producers, and the food;
- to inform and influence consumers by nudging them toward sustainable food with information, education, and, in the physical arena, sampling “new” and “new-old” food;
- to reduce food waste;
- to provide full transparency on the food's origin, degree of ripeness, and nutritional value;
- to reduce the range to avoid marketing unsustainable products;
- to create a system that uses plastic efficiently and a recycling system for the plastic still in use.

The report about Svea's Arena² along with five associated reports are available in Swedish on the Environmental Protection Agency's website.

The jury's motivation for the winning entry

“The two teams, **Green Peas** and **Blue Team**, have each submitted an innovation proposal, **Svea's Arena** and **Nutrition Resilience Map**. Both proposals are elaborate, and the teams show great wealth of ideas and knowledge. The proposals from the two teams are broad in their approach, and it is possible to find beginnings of many good ideas that can be further developed.

Both proposals are equal in many ways and choosing a winner has not been easy. However, the jury has unanimously decided to nominate the **Blue Team** as the winner. According to the jury's assessment, their proposal **Nutrition Resilience Map** is a highly-coherent proposal that clearly manages to explain and link the different parts of the contribution. It has conceptual values that have the potential to be implemented as a policy instrument. We see their approach to the problem from a conceptual perspective as the innovative aspect of the proposal.

We also assess that environmental and sustainability discussions in the proposal have a breadth based on the theory around which the proposal revolves. In terms of feasibility, the proposal takes a systematic approach that can be built on.”

² http://www.naturvardsverket.se/upload/miljoarbete-i-samhallet/miljoarbete-i-sverige/innovation-for-miljomal/1_Lagrapport%20Green%20Peas.pdf

The competition

The competition was carried out by the strategic innovation programme RE:Source, in collaboration with the Swedish Environmental Protection Agency. The Swedish EPA has contributed with financial support, participation in the management group, and communication with an authority group.

The challenge was finding solutions on how to provide food in the future. How do we protect, transport, and communicate food sustainably?

The format

Two creative teams competed to find solutions for a specific challenge. They met on four occasions and then presented the contribution at a final meeting. During the four meetings held at carefully selected environmentally-certified locations, the teams attended inspirational lectures and workshops. Interested observers were invited to the closing meeting. The award ceremony was replaced by a virtual meeting where the jury presented their assessment and the winning team was crowned.

Prior to the innovation competition, an open-ended issue was chosen to attract participants from different sectors and with different skills. Compared to previous competitions, the competition format was changed from having team registrations to individuals registering themselves and then the competition management put together the teams.

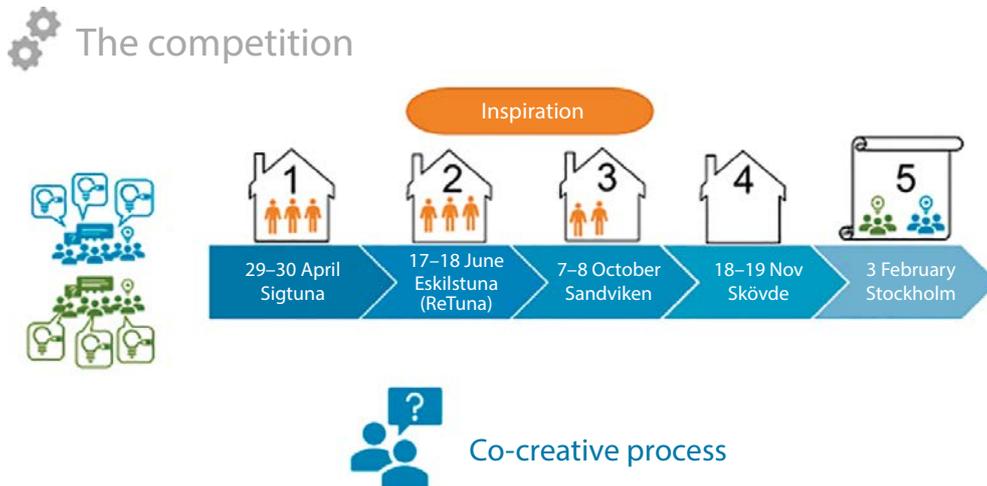


Figure 4. The competition was conducted on four different occasions during 2019. The fifth and final meeting was a presentation.



Figure 5. Different functions in the competition.

Participants with broad competence

The teams were made up of representatives from both the public and private sectors. Each team had eight members. The team members had a broad range of competences in sustainability, plastics, logistics, and food. The participants were able to apply to join the competition, and the management also contacted potential participants separately.

Blue Team

Per Rosander	Region Västra Götaland
Fredrik Viktorsson	Region Kronoberg
Axel Boëthius	KF Stockholm
Elinor Samuelsson	HappyLab
Ian Hamilton	Econova
Lena Hägg	HappyFood
Maja Jakobsson	Miljögiraff
Rasmus Lundqvist	RISE

Green Peas

Anette Olovborn	Swedish Association of Local Authorities and Regions (SALAR)
Ingrid Strid	Swedish University of Agricultural Sciences, SLU
Linda Hagdahl	Region Stockholm
Magnus Björk	IKEA
Magnus Hedenmark	re:profit
Mikael Thorberg	Auxin Stockholm AB
Rowan Drury	Gram
Tobias Forngren	Freelway

Inspiration and workshops

The following topics were discussed in inspirational lectures and workshops at the meetings. The original titles are in Swedish.

- Packaging & function Helén Williams (KAU)
- Beyond GDP growth Pernilla Hagbert (KTH)
- Transformative solutions Dennis Pamlin (RISE)
- Trends in food systems Frida Jonson och Lovisa Madås (AGFO)
- Future mapping – workshop Frida Jonson och Lovisa Madås (AGFO)
- Biomimicry Karolina Nätterlund
- Biomimicry – workshop (Region Jämtland Härjedalen)
- Sharing logistics Tobias Forngren (Freelway)
- Self-sufficiency Johan Nyqvist (Sweco)
- Drones Rasmus Lundqvist (RISE)
- Innovation methods Magnus Hedenmark (re-profit)
Anette Olovborn, (SALAR)
Peter Löwenhielm (RISE)
- Graphical recording Helena Lindholm

Authority group following the competition

The group was appointed by the Swedish EPA. The agency provided the group with on-going information about the competition and with questions that arose about obstacles and opportunities in existing legislation and policies. The authority group was also invited to the concluding meeting when the teams presented their contributions.

The following authorities participated:

Swedish Energy Agency

Formas, a government research council for sustainable development

Vinnova, Sweden's innovation agency

National Food Agency

The National Agency for Public Procurement

Swedish Agency for Marine and Water Management

Swedish Chemicals Agency

The Swedish Agency for Economic and Regional Growth

Swedish Board of Agriculture

Swedish Environmental Protection Agency

Jury and assessment criteria

The assessment of the teams' innovation proposals was performed by Andreas Englund from IVL Swedish Environmental Research Institute, together with Axel Nekham from the Swedish EPA and Anna Aspgrén representing RE:Source.

The jury assessed the competition entries based on the following criteria:

- Customer needs and market potential
- Innovativeness and innovative reach
- Environmental and sustainability value
- Feasibility

The assessment of the contributions focused on the solutions presented by the teams in their report and the oral presentations at the concluding event.

Evaluation of the project

The National Innovation Competition Office at RISE evaluated the competition. It was carried out through surveys and direct interviews with the participants during one of meetings and after the end of the competition. The evaluation was presented as a report³. The purpose of the evaluation was to provide support in the design of future innovation competitions based on the same concept. More to read is found under the heading Lessons learned.

³ Rydehell, H, Utvärdering innovationstävling kring plastens roll i nutrition och hälsa, Nationella innovationstävlingkontoret, RISE.

Additional activities

Report on circular economy

On behalf of the Swedish Environmental Protection Agency, Dennis Pamlin and Madeleine Enarsson produced the report *Incremental Circular Economy as a Serious Sustainability Problem – How to turn the focus on circular economy into a driver for global sustainability*.⁴

The report explores different ways of understanding the relation between business model innovation and a circular economy. The aim is to provide guidance for companies, intrapreneurs in companies, and organisations working with circular economy and to provide a structure to understand very different approaches and their outcomes.

Workshop for university students

We hosted a one-day workshop for eight university students. They were given the same challenge as the two teams, but a more strictly defined picture of the vision of the future.

They were told to picture a future with a circular flow of resources, fossil-free transportation, sustainable local food production, and a society with changed policies and regulations.

The workshop was divided in three parts.

1. Half of the group brainstormed about how to provide food at home and the other half about how to provide food in a hospital.
2. The group then worked together to combine the solutions.
3. Finally, they presented the solutions by describing them, what is new, what the benefits are, and whether they are feasible today.

The workshop was led by Karolina Nätterlund from Region Jämtland Härjedalen. She was assisted by the teachers Anna Longueville and Åsa Lind Chong from Mid Sweden University, by Alex Nekham from the Swedish EPA, and by Jonas Enebro och Lena Stig from the competition management.

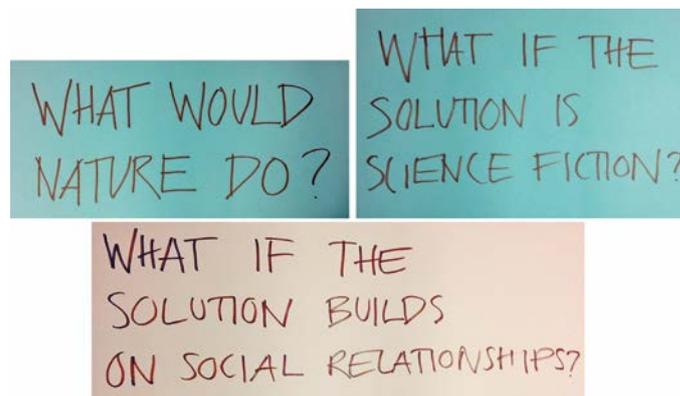
⁴ <http://www.naturvardsverket.se/Documents/publikationer6400/978-91-620-6906-3.pdf?pid=25870>



Figure 6. The students and the process leader Karolina Nätterlund.

The students at Mid Sweden University studying ecotechnology in Östersund were Kristian Zackriksson, Leo Xylander, Rinke de Zwart, Laurens Post, Mohamad Mubarak Drgham, Stanislav Petraitis, Anna Norell, Leonie Goejer, and Sanna Olsson.

The innovation process started with the two groups brainstorming about the purpose and needs. The process leader gradually contributed some questions.



There was a stream of ideas and thoughts. Here are some examples of what they were talking about:

- Reuse/recycle/milk bottle system, What material and options are there?
Develop concept of a more innovative way to use recycled bottles
- Social aspects: How to transport food?
How do we get peoples to accept changes?
- Transportation: walk – bike – reasons to get outside and move about

- Waste? Compost, close the loop – get back to the producer
- Smart system for supermarkets
- Create more value for food
- Consumption of food will include aspects of freedom
- More expensive to use single-use products
- Stimulate the right choices
- How does nature solve it?
- Use of energy in all steps?
- Plastic budget
- Make the most sustainable choices the cheapest and most beneficial

At the end of the day, they presented a holistic solution with food in the centre.

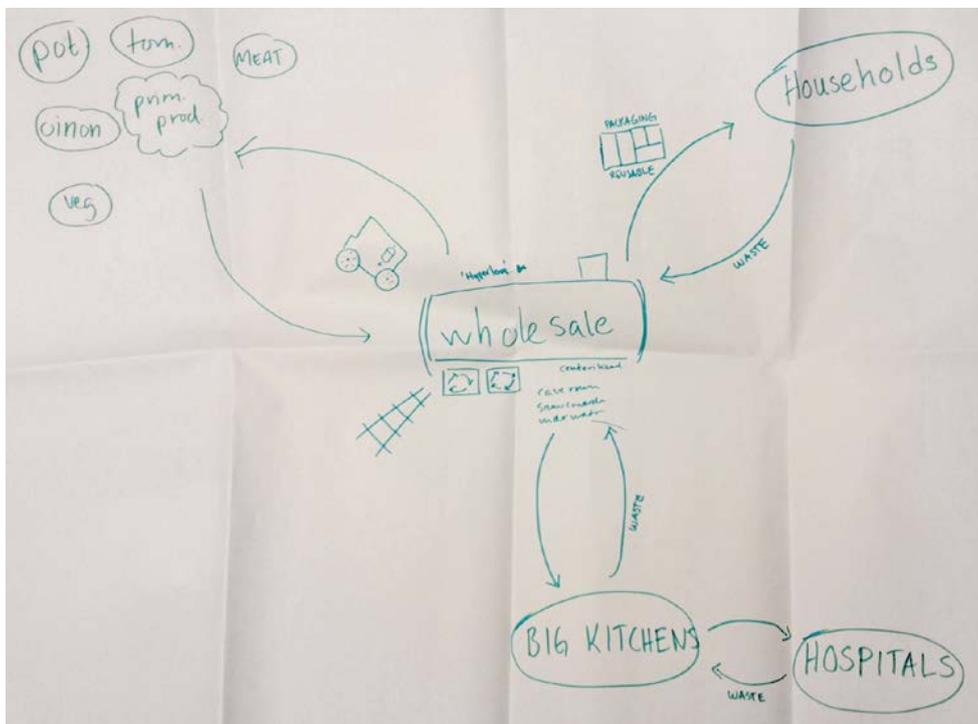


Figure 7. Simplified drawing of the student's solution.

Originally, the idea was that a third team of students would work in secret with the same challenge. However, it proved difficult to create a student team unless they could receive credit for the work within their existing course of study.

University teacher Anna Longueville made it possible to hold the much-appreciated workshop. This optional workshop was for students attending the course Environmentally Driven Innovation. The student team's solution was not part of the competition. Two of the students were invited to the concluding event to present their solution, but unfortunately, they were unable to participate. Their work was presented instead by the responsible university teachers.

Lessons learned

The competition's goal of finding new solutions was met, but since the effects of the new solutions will only be realised when they are implemented or introduced on the market, the most important lesson is that they must be promoted. Efforts and activities to facilitate moving forward should be included in the competition.

The evaluation reflects the view of the competition management while showing that the discussions that preceded the competition were very relevant. Issues that were discussed when planning the competition were the formulation of the challenge, vision for the future, the design of the teams, and how to balance creativity and structure.

The competition management chose not to appoint a team leader so as not to dampen creativity and because they did not know the team members well enough. The intention of choosing an open-ended competition question was to attract people with different perspectives and different skills and to create space for creativity.

The evaluation indicates that several of the participants had wanted better guidance through the process, for example by assisting each team with a process leader. It also indicated that the competition participants were most attracted to the actual competition challenge of providing nutrition and health, while the part dealing with the role of plastic contributed to difficulties in creating a vision for the future.

The competition management learned from this and therefore chose to more clearly frame the challenge in the workshop for the students and let them start directly with the solutions. So, they were given the same challenge but with the vision for the future predefined.

Originally, the idea was that a third team of students would work in secret with the same challenge as the official teams. However, it proved difficult to create a student team, unless the students receiving credit for the work within their existing course of study. If a student team is to participate, it should therefore be arranged with their higher education institutions well in advance.

University teacher Anna Longueville made it possible to hold the much-appreciated workshop. It was an optional workshop for students who were attending the course Environmentally Driven Innovation. The students already knew each other, which facilitated the collaboration.

Although the evaluation showed that the team worked well during the competition, the teams were considered slightly large, which contributed to difficulty in moving forward at the meetings, when many opinions were being expressed.

The composition and size of teams is thus important for the outcome. The competition's challenge and design also influence this. The majority thought that the teams were well composed and that there was enough competence within the group. It was fun, exciting, and educational to meet people from other industries with many different skills.

As for the competition format itself, the competition participants felt the opportunity to get away for two days was a good and fun approach. They could focus wholeheartedly on the competition.

More focus with working on the competition could be done at the meetings and the meetings could be held with less time in between to avoid losing focus.

The participants are generally very satisfied and positive about the competition and the skills development and contacts it has contributed to. This value-creating effect of gaining new knowledge and solving problems together was something we were striving for.

From idea to action

The most important work remains and that is to make a reality of the solutions and goals the teams created, to take the results further. To achieve the change we want, the solutions must be tested and implemented.

The plan was for the teams to present their solutions at least twice during spring of 2020. One occasion was RE:Sources' results day and the other was the Circular Material Conference. The purpose was to disseminate the results but also for the teams to meet stakeholders who could take the solutions further. These plans were made before the corona pandemic entered into the picture.

The Swedish Environmental Protection Agency therefore held a virtual follow-up meeting on 27 May 2020. At the meeting, the teams had the opportunity to present development ideas to invited participants, followed by discussions in groups.

The four presentations with discussion groups were:

1. A policy tool for transitioning to a locally resilient food production system.
How and with whom can the policy tool be tested?
2. This is how we create traceability of content, transport, and packaging – from field to consumer.
How can traceability be implemented and be financed?
3. New sustainable transport of food for co-supply.
How can grocery stores, logistics solutions, and co-supply support a societal change?
4. How does the Swedish Association of Local Authorities and Regions work with Vinnova on sustainable development in the food supply?
Can municipal schools change food production?

It was also suggested to have a collaboration with Vinnova and the National Food Administration on their mission “Nutrition and health” and on “A recipe for sustainable school food”. A research institute has shown interest in how the winning proposal can be used as a framework for studying food security at different levels where there is a common thread between these individual, local, regional, and national levels.

The different participating stakeholders take different aspects of this competition work back to their different organisations. Some of the participants have continued to collaborate on different concepts in small groups after the competition.

A sidetrack from the competition is a newly started effort on traceability of material “from source to end customer”. This effort includes transport, recycling, reuse, and life cycle analyses of global plastic use.

References

1. Report Nutrition Resilience Map, Blue Team
2. Report Svea's Arena, Green Peas
3. Pamlin, D Enarsson M *Incremental Circular Economy as a Serious Sustainability Problem – How to turn the focus on circular economy into a driver for global sustainability*, NV Report 6906, December 2019
<http://www.naturvardsverket.se/Documents/publikationer6400/978-91-620-6906-3.pdf?pid=25870>
4. Rydehell, H, Utvärdering innovationstävling kring plastens roll i nutrition och hälsa, Nationella innovationstävlingkontoret, RISE

Innovation competition for sustainable plastic use

REPORT 6940

SWEDISH EPA
ISBN 978-91-620-6940-7
ISSN 0282-7298

How do we shape a sustainable food system?

A COOPERATION DURING 2019 BETWEEN SWEDISH EPA AND
THE STRATEGIC INNOVATION PROGRAMME RE:SOURCE

In 2019, an innovation competition was held on future ways of providing food sustainably and resource-efficiently.

Two creative teams with expertise in plastics, logistics, and sustainability developed solutions focused on a more regional food supply and that allow us to reduce the amount of plastic, packaging, and transport.

The winning submission is a conversion tool describing the principles for sustainable production and consumption of food at various levels.

