



UNOFFICIAL ROOM DOCUMENT¹

**DIALOGUE ON PLASTIC POLLUTION AND ENVIRONMENTALLY
SUSTAINABLE PLASTICS TRADE**

NORIWARE PRESENTATION ON SEAWEEED PACKAGING

Pre-Plenary Meeting – 12 April 2024

DOCUMENT DE SÉANCE NON OFFICIEL¹

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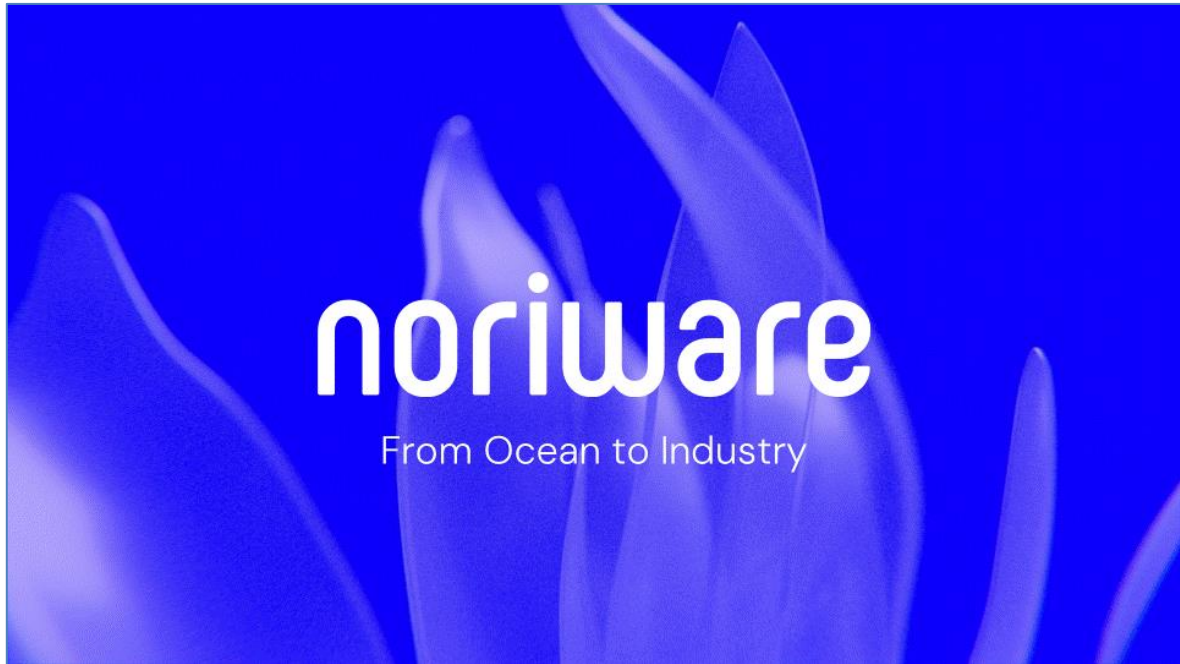
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* In Original language only/En langue originale seulement/En el idioma original solamente.

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Problem

The plastics pollution: A global issue harming the environment and our health.

Resource Problem

Non-renewable resources are being exploited by the packaging industry

95%

of the net increase in oil demand comes from plastics¹

Emission Problem

The production of plastic releases emissions into the atmosphere

3.5kg

of CO₂ is produced per 1 kg of plastic²

Recycling Problem

Plastic is too low-priced to collect and sort

90%

of manufactured plastic is not being recycled, ending up as microplastic in the environment³

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Packaging Dilemma

The shortcomings of bioplastic packaging prevent it from being accepted on the mass market as a solution to plastic pollution.

Inferior characteristics

Bioplastics are not meeting industry standards.

→ Lack of transparency and material properties

Inferior degradability

The degradation of bioplastics fundamentally varies while some types persist like traditional plastics.

→ Lack of labeling and certification

Inferior sustainability

Bioplastics may combine biological materials and traditional petroleum-based components.

→ Lack of standardized recycling infrastructure

Huge market opportunity

Industry acceptance prevents bioplastic packaging applications from going mass markets

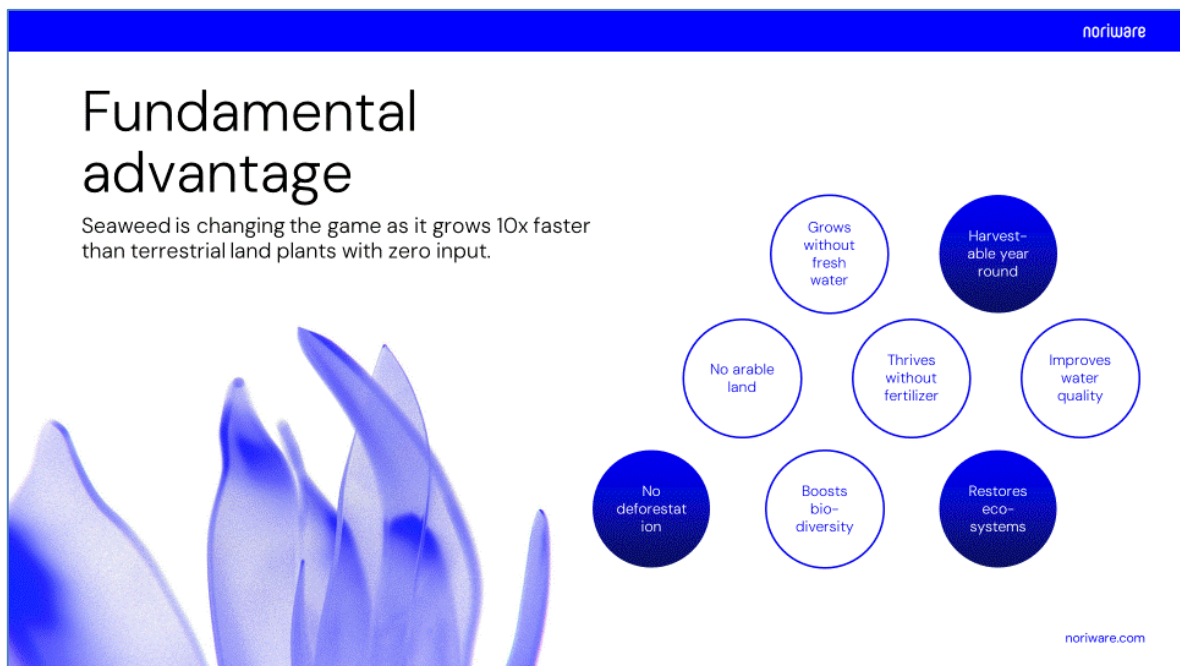
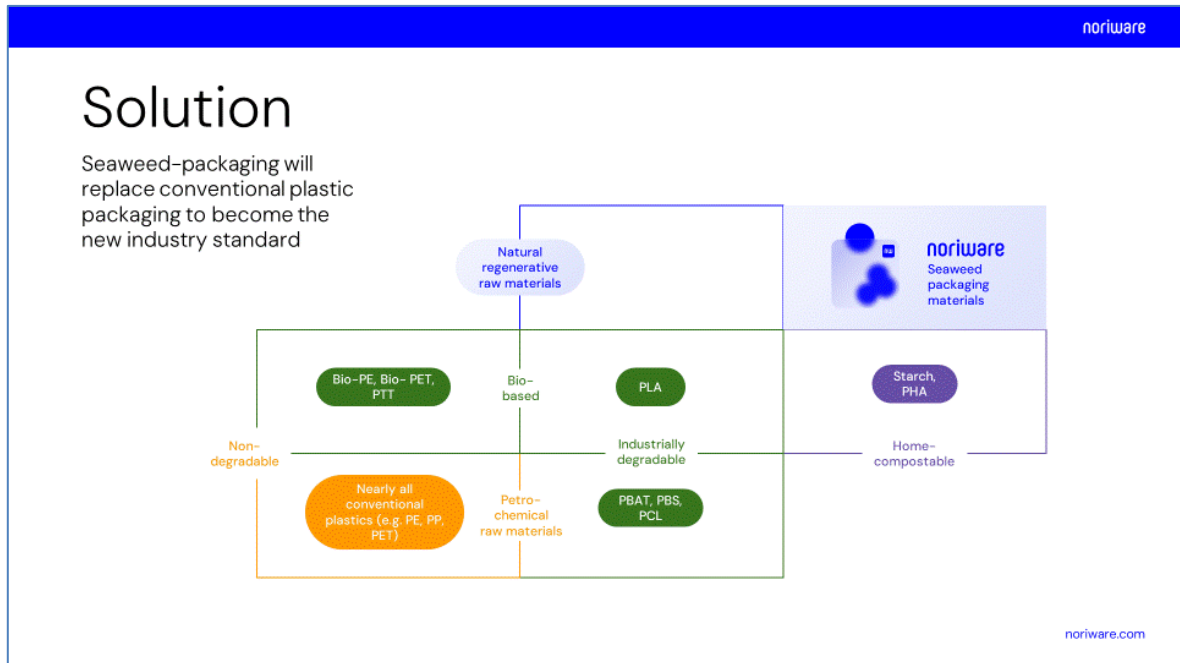
Category	Value
Conventional plastic packaging	96%
Bioplastic packaging*	4%

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We are revolutionizing the packaging industry by replacing single-use plastic and driving innovation through the power of seaweed.

Our goal is to inspire sustainable choices that benefit our planet, people and prosperity, and to lead the way to a more sustainable and innovative future.

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A pioneering product

noriware pioneers plastic-free seaweed packaging through biochemistry and advanced material engineering, starting with protective films.




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Technology

We develop plastic alike packaging through advanced material engineering.

Modification / Lab Phase

- **1 Selection of Raw Materials**
Selecting suitable algae-based biopolymers for specific applications
- **2 Biopolymer Modification**
Obtaining physicochemical properties through chemical reactions at molecular level
- **3 Pellets Formulation**
Compounding/formulation, using fillers, additives and/or plasticizers

Process Engineering / Scale-up Production


- **4 Scale-Up Development**
Continuously adjusting parameters for scale-up from lab phase
- **5 Quality Management**
Analyzing quality of raw materials and engineering processing steps
- **6 Packaging Production**
Continuous manufacturing of various algae-based packaging materials

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Our promise

Through innovative, eco-friendly packaging solutions, we promise to minimize plastic waste while still meeting consumer needs.
















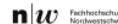
- Our materials offer high transparency and stable mechanical properties, replicating conventional plastics.
- Our application simplifies paper recycling, removing the need to separate the viewing window, thus easing waste disposal and lessening environmental impact.
- Our water-soluble packaging maintains recycling integrity, yielding a mono-material suitable for new products.

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Meet the Seaweed Enthusiasts...

We have brought together an outstandingly skilled team of makers, entrepreneurs, scientists and industry experts.

						
Jessica Farda CEO + Co-Founder	Stefan Grieder COO + Co-Founder	Daniel Widner CTO + Material Scientist	Lisa-Jo Roth Product Manager	Dr. Elham Martin R&D Scientist	Francesca Fabbri Research Intern	Lucian Zweifel R&D Engineer
B.A. in International Affairs	B.Sc. in Mechanical Engineering	M.Sc. in Material Science	M.Sc. in Business Chemistry	PhD in analytical Chemistry	M.Sc. in Biotechnology for the Bioeconomy	M.Sc. in Mechanical Engineering
 University of St. Gallen	 Fachhochschule Nordwestschweiz	 ETH zürich	 University of Zurich	 INRAE	 UNIVERSITA' DEGLI STUDI DI MILANO	 Fachhochschule Nordwestschweiz

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...and the Assembly of Top-Class Advisors

In collaboration with top polymer scientists, senior industry leaders, and groundbreaking project architects, we're pioneering the future of sustainable packaging.



Prof. Dr. Markus Grob
Advisor Chemistry

Ph.D. in Polymer Chemistry + 30 years industry and research experience in creating sustainable plastic-based products and process innovations



Prof. Dr. Karsten Frick
Advisor Process Engineering

Ph.D. in Organic Chemistry + 25 years experience in developing and processing high performance polymers



Christoph Tonini
Business Advisor

CEO Swiss Market Place + Board Member Migros, Properi, TX Group



Ronald Graf
Sales Advisor

CMSO + Board Member of Schelling



Ertan Wittwer
Investor + Board Member

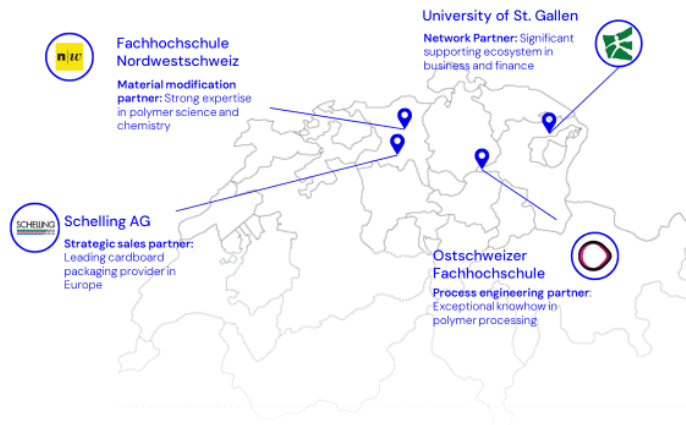
Co-Founder bestsmile, Care, Betterview, HAIR & SKIN + General Partner FAIR VC



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noriware's strong partner network

We gathered a first-class network of scientific and industrial partners



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References

¹Organisation for Economic Co-operation and Development (OECD) OECD work on plastic, 2024, [OECD](#).

²Shrivastava C, Crenna E, Schudel S, Shoji K, Onwude D, Hischier R and Defraeye T (2022) To Wrap Or to Not Wrap Cucumbers? Front. Sustain. Food Syst. 6:750199. doi: 10.3389/fsufs.2022.750199

³European Environment Agency (EEA), Plastics, 2024, [EEA](#).

⁴Plastic Packaging Market, <https://www.precedenceresearch.com/bioplastic-packaging-market> and <https://www.precedenceresearch.com/plastic-packaging-market>, 2023.

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