REDUCE

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Course:
Visualizing complexity
MAPD5210-3 21H

w/ Tore Geldien

Rethinking everyday plastics

REDUCE is a research project conducted over one semester at Oslo School of Architecture and Design, in collaboration with Norwegian Institute for Water and Environmental Research, for studying systemic design methods.

The project will land based the current focus on studying the micro-plastic emitting tire industry, and how a systemic design approach can be utilized to cause a change in the way consumed tires are being disposed of, in order to reduce the flow of microplastic.

Our hope for the overarching design goal is to "reduce the amount of microplastic in the environment by 50% by 2030". This is based on the ambitious goal set by the Norwegian government, to reduce the amount of microplastic by half, the national level, from a target the same convention is known.

Alice Agneta Dale
Master student

CONCEPT 1	Reduce micro plastic within artificial turf through maintenance and usage
CONCEPT 2	Facilitate a best possible gaining experience for users with a micro-adjusted approach towards sustainable artificial football pitches
CONCEPT 3	Facilitate a fair supply of financial funds by activation that leads to more people being included in the cultural differ and increased awareness of the problemes associated with the spread of rubber granules.

HOW TO READ THE MAP

Line composition

- Connection to system
- Stakeholders
- Sub-systems
- Sub-sub-systems
- Flows, Thickness by material flows
- Actors, Thickness by stakeholder focus
- Actors or flows

Box composition

- Stakeholders
- Sub-systems
- Sub-sub-systems
- Sub-sub-sub-sub-systems
- Stakeholder groups, interesting stakeholders
- Problems, problem areas

Abbreviations

- PP - Product phase
- U - Use phase
- LU - Late-use phase

WHAT DOES THE MAP CONTAIN?

Page 1
- **Aim when REDUCE**
- Research questions
- Methodological approach
- Theoretical framework

Page 2 - WHERE DO THE ACCUMULATED TIRES GO? THE TIRE INDUSTRY
- How did we end up here?
- Tire industry
- Rubber granules - what is it, how is it produced? Uses?
- Rubber granules - where does it go to, the Norwegian case
- Rubber granules - what does it do to the Norwegian nature?
- Tire industry - what happens with the tires?
- Tire industry - what happens with the rubber granules?
- Tire industry - what might happen if the resource is mis-used?
- Tire industry - what seems to be the issue?

Page 3 - ARTIFICIAL TURF PITCHES AND INCLUDED ISSUES
- Overview - rubber granules
- Artificial turf pitch - what happens with the rubber granules?
- Focus
- Artificial turf pitch - what happens to users' maintenance?

- Problem and stakeholder map
- Problem areas - interviews
- Problem areas - literature
- Problem areas - observations
- Problem areas - conclusion
- Stakeholder analysis
- Stakeholder analysis - interviews
- Stakeholder analysis - observations
- Stakeholder analysis - conclusion
- Value chain
- Value chain - interviews
- Value chain - observations
- Value chain - conclusion
- Concept development
- Concept development - interviews
- Concept development - observations
- Concept development - conclusion
- Concept development - workshop
- Concept development - workshop - conclusion
- Concept development - workshop - observations
- Concept development - workshop - observations - conclusion
- Concept development - workshop - observations - conclusion - concept 1
- Concept development - workshop - observations - conclusion - concept 2
- Concept development - workshop - observations - conclusion - concept 3
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- Concept development - workshop - observations - conclusion - concept 3 - sub-concept 2
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1 Tire industry

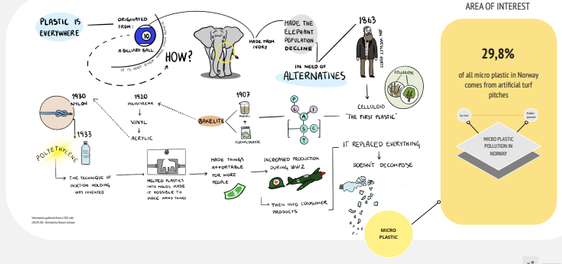
2 Artificial turf pitch

3 Impact

RESEARCH QUESTION

How might a systemic design approach be used to reduce the problem of microplastic pollution from artificial turf pitches?

The history of PLASTIC



AREA OF INTEREST

29,8%

of all micro plastic in Norway comes from artificial turf pitches

MICRO PLASTIC POLLUTION IN NORWAY

Information gathered from a TRD case
2019-05-06 - Kennedy by Rasem Gaboon

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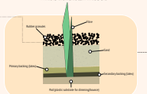
MICROPLASTIC IN CONNECTION TO THE TIRE INDUSTRY

1

HOW DID WE END UP HERE?

What is artificial turf made of?



RUBBER GRANULES - INCREASING EMISSIONS

SOURCE	2014	2020
Plastic pellets	410 T	370 T
Synthetic textiles	669 T	1 357 T
Car traffic	6 110 T	8 525 T
Artificial turf tracks (rubber granules)	5 008 T	5 918 T
Products with added microplastic	340 T	776 T
Tyre, weathering and maintenance	2 135 T	3 617 T
Waste management	456 T	3210 T

Information from: SSB (Statistics Norway) and Norwegian Institute for Water and Environmental Research (NIVA)

The microplastic emissions has almost doubled in 6 years.

We must stop its control all the emissions from RG - could be more, could be less.

WHERE DO THE ACCUMULATED TIRES GO?

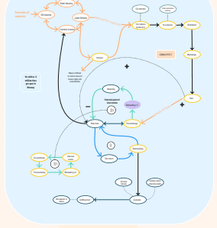
The amount of tyre that goes to Rock Debenture to be granulated have more than tripled in two years.

Up until recently it was recommended to refill with EU-tires of 80 c.p.m. In the recent years, there has been a change in environmental scope, and tires have been implemented multiple places in Norway. Norway now refills with 100% granules and tire chips.

Conclusion from the statistics on this page: The emissions from RG have increased significantly, and the amount of tyre that Norway does disposed by more than 70%, compared to what it was two years prior.

RUBBER GRANULES MAP

The value chain - what happens with the tires?


Car tyres
Tire shreds
Tire chips
Tire chips for energy
Tire shreds to facilities
Layer for shooting range protection
Cover pragrid for verdrags-prosjekter
Tire for rubber granulation
Tire for rubber granulation