

KG 2021

IAKS Nordic Webinar

Artificial turf research

NTNU - Center for Sports Facilities and Technology

Bjørn Aas

June 24, 2020

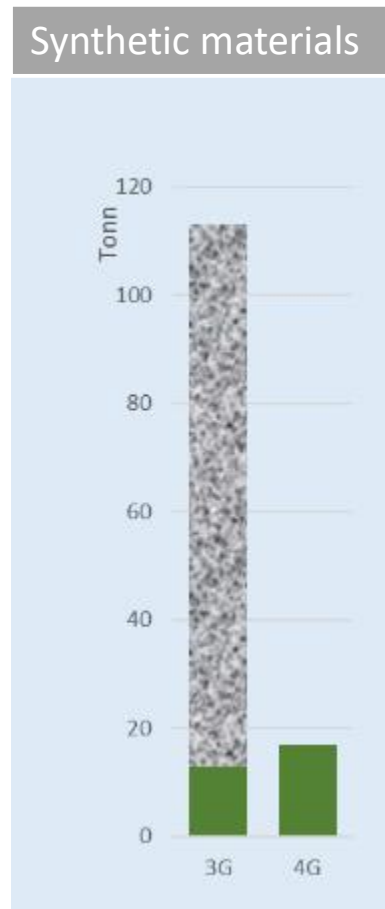


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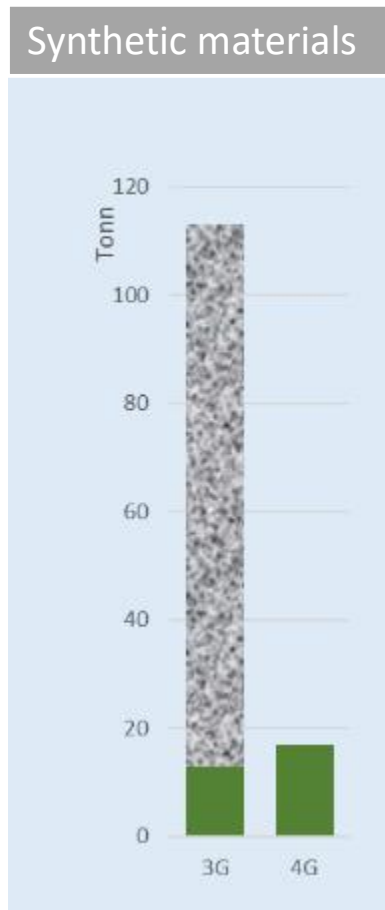
KG2021 - a project on artificial turf

Objective and measures



1. Reduce microplast pollution >80%
 - By reducing amount of plastics
2. Reduce heavy metal pollution >> 90%
 - By removing the harmful substances
3. Enable reuseable fraction >90%
 - Sand, infills, fiber...
4. Improve lifetime of products
5. Reduce life cycle costs
6. Ensure usability for all user groups

KG2021 - project structure



WP1

Sports

Leg-shoe-turf interaction

Annual performance testing of fields

WP2

System

Design, construction, materials

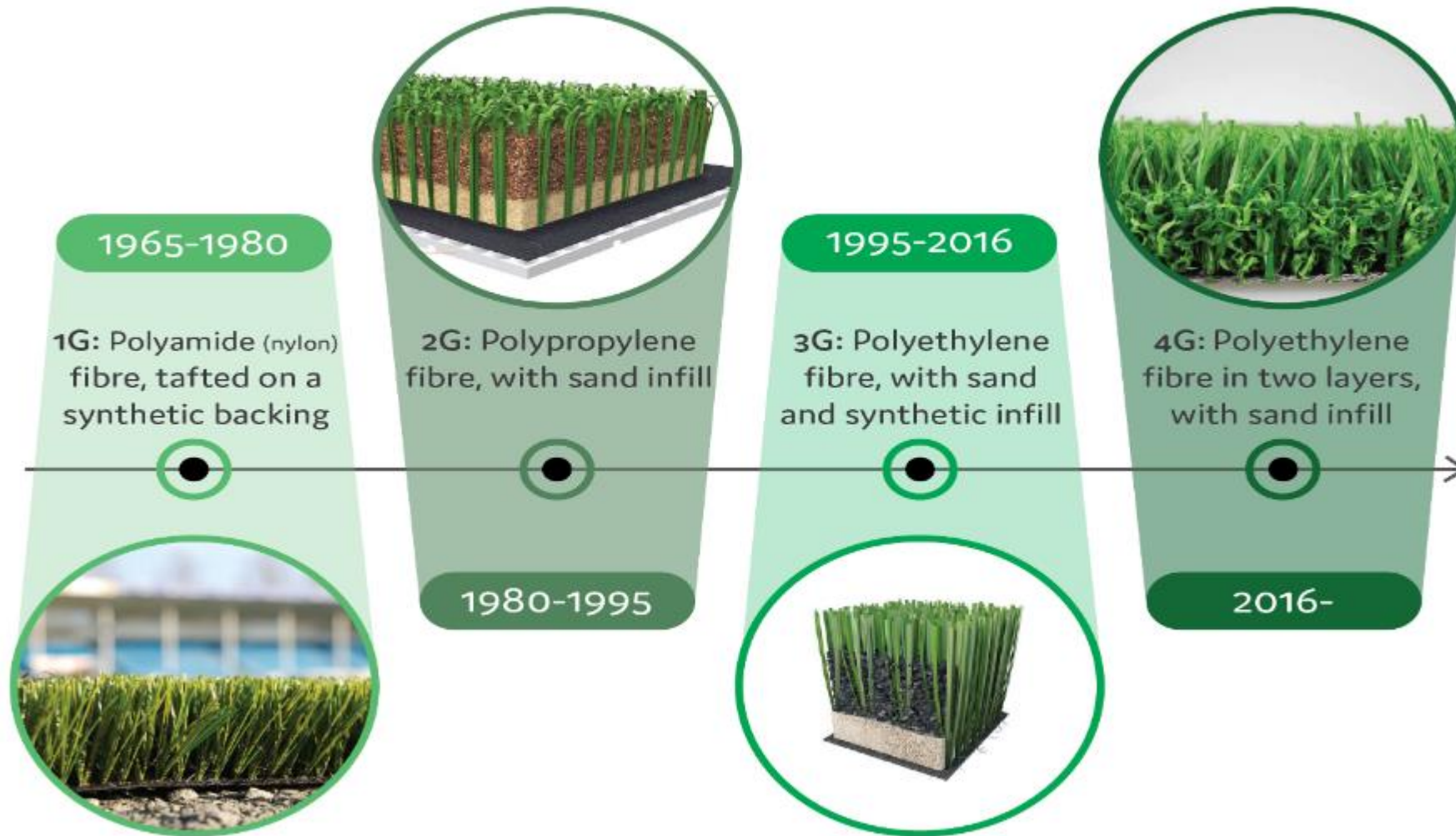
Procurement and contract strategies

WP3

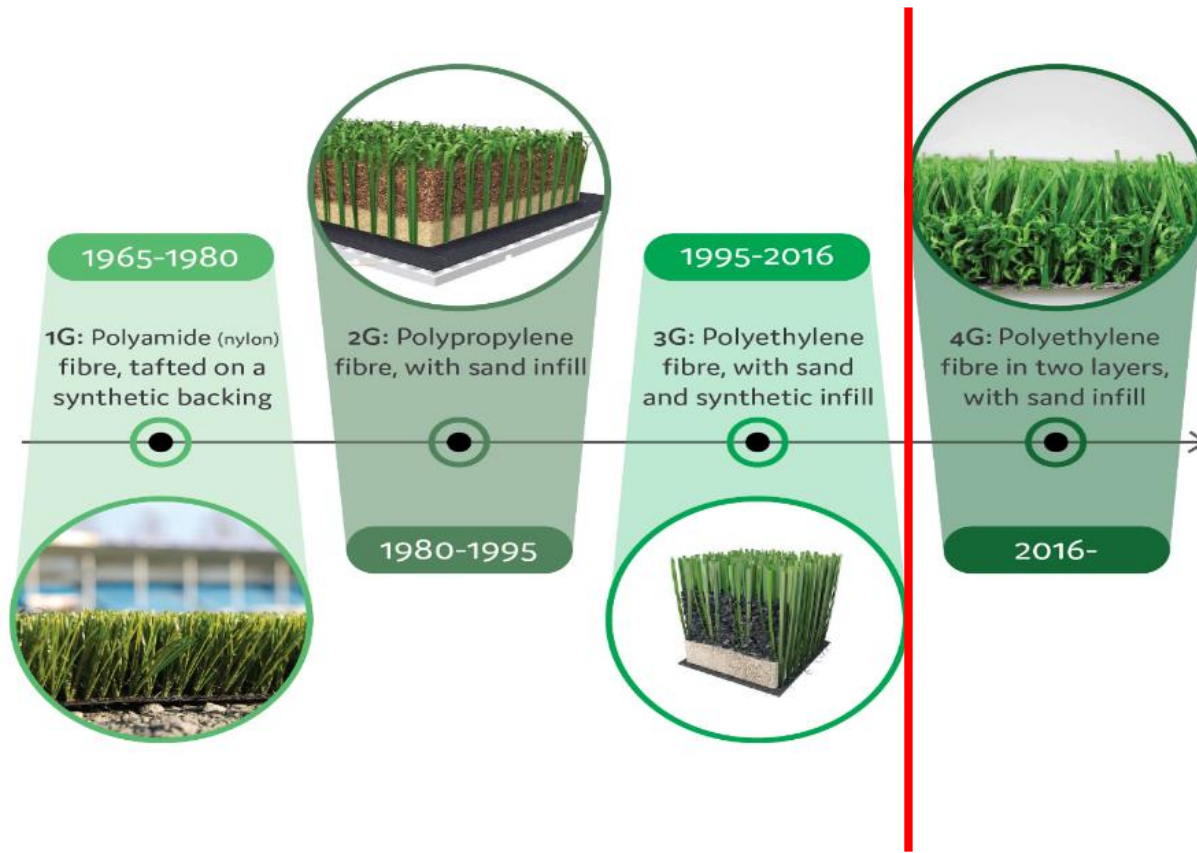
Environment

Impact and user exposure

Artificial turf in four generations



Development in technology



Dense fiber structure, no infill



Artificial turf – a product matrix

FIBER	60mm	42mm	42mm	42mm	35mm	35mm	35mm	35mm
INFILL	15 kg/m ² SBR	7 kg/m ² SBR	7 kg/m ² TPE	7 kg/m ² EPDM	15-30 kg/m ² Coated sand		2 kg/m ² Olive pits	
SAND	19 kg/m ²	13 kg/m ²	15 kg/m ²	15 kg/m ²		15 kg/m ²	15 kg/m ²	
SHOCKPAD		12mm	12mm	12mm	12-14mm	20-35mm	23-35mm	30-35mm



KG2021 Pilot and reference fields

- Pilot fields

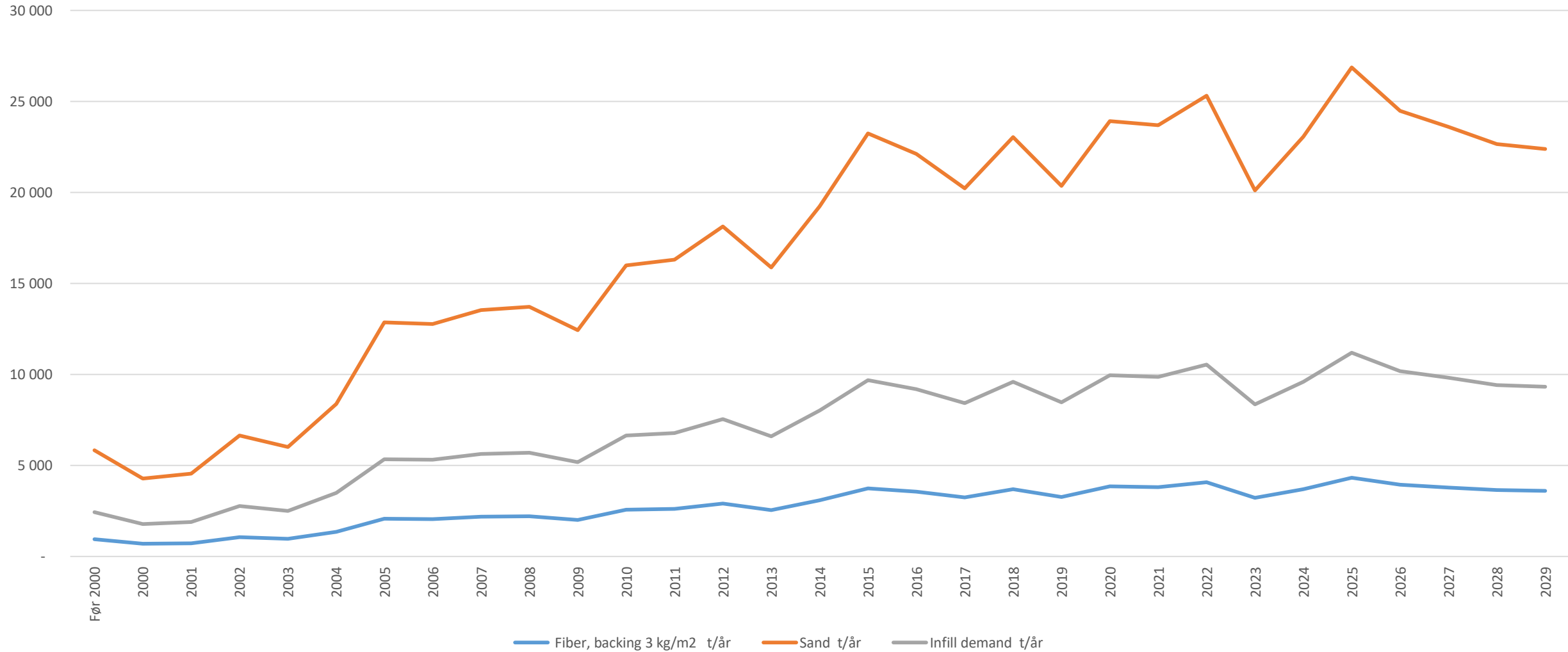
- 2x 4G with sand and olive pits, 12mm pad
- 1x 4G with sand and olive pits, 30mm pad
- 1x 4G non infill, 12mm pad
- 1x 4G non infill, 30mm pad (in process)
- 1x 4G ---- (in process)

- Reference fields

- 2x 3G with sand and SBR, 12mm pad
- 1x 4G with sand and olive pits, 30mm pad
- 1x 4G with sand and cork/coconut husk, 12mm pad

Recycled fiber, sand, pad

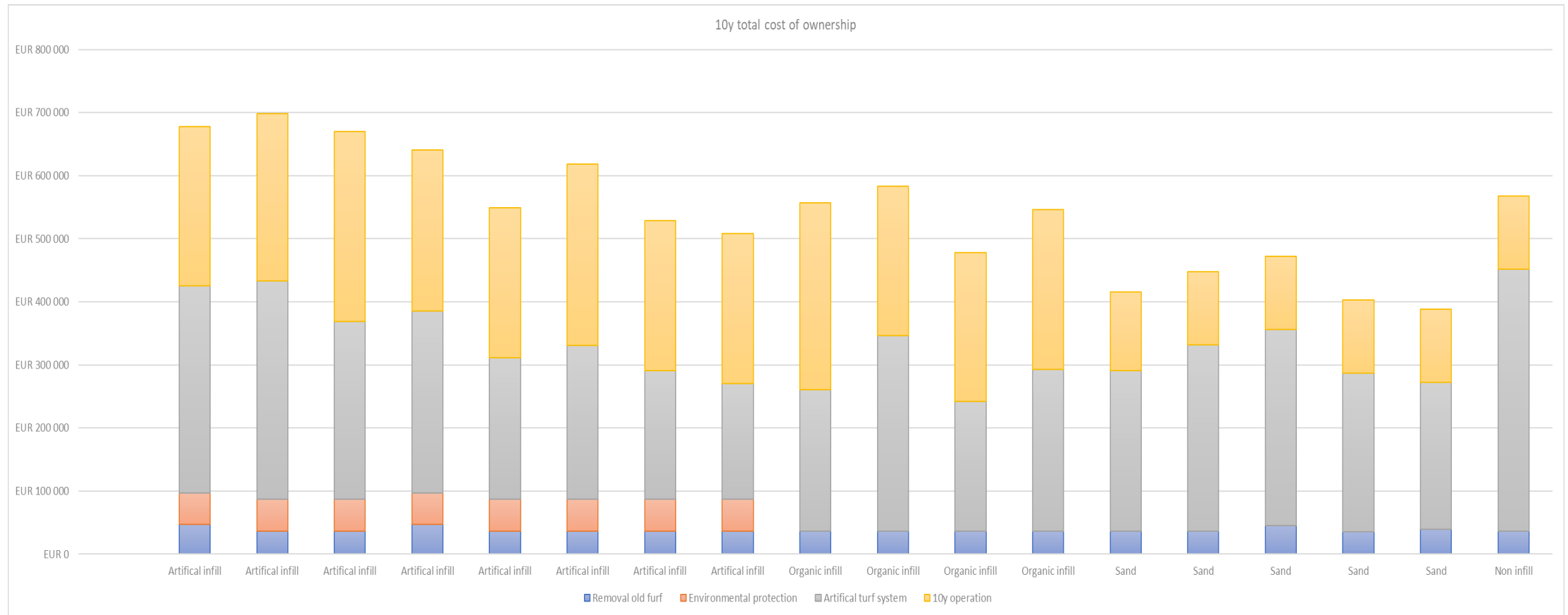
Waste: Trend analysis 2000-2029



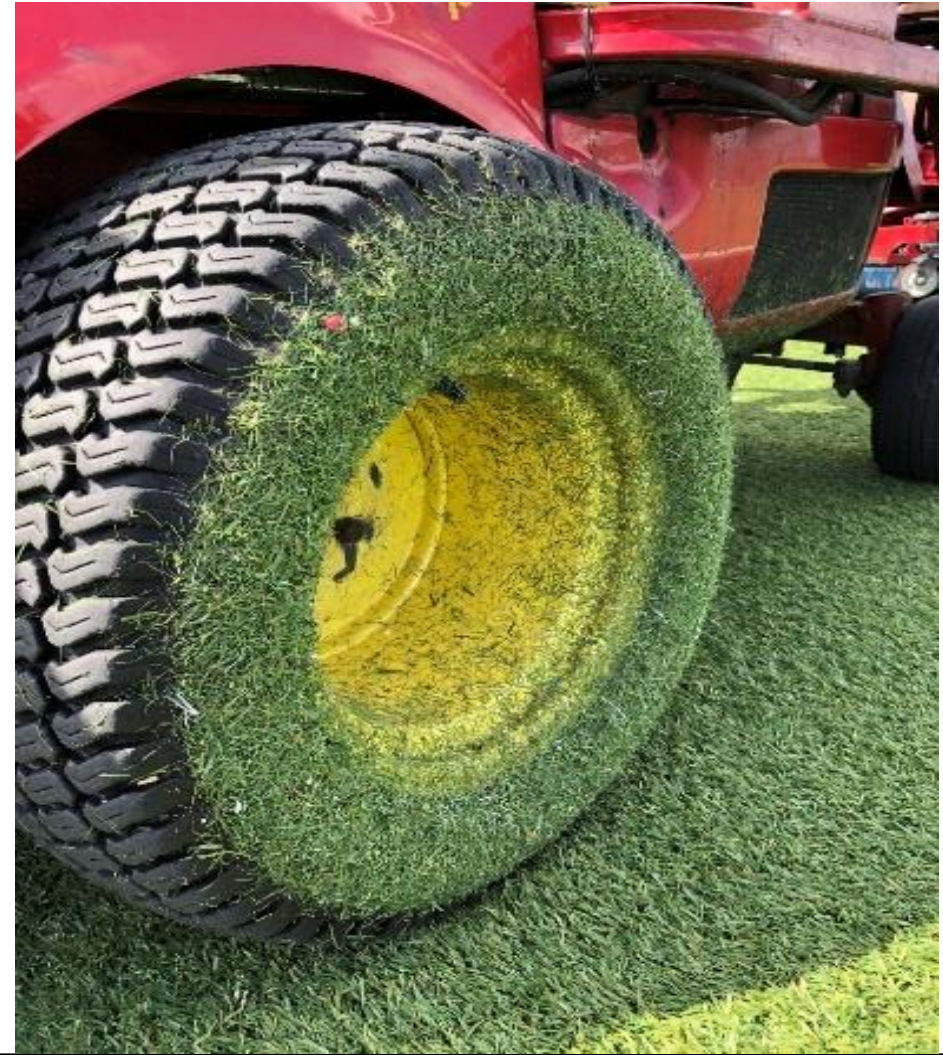
Findings after Year 1

- WP1 Sport
 - Test methods subject to improvement
 - Design for the users
 - Schools and playgrounds vs match arenas
- WP2 System
 - System design (pad, turf, infill)
 - Maintenance equipment, procedures
 - Durability of fibers
 - LCC
- WP3 Environment
 - Remove polluting materials is low cost solution
 - Reduce environmental impact on product level

LCC– Total Cost of Ownership



Fiber wear and tear – another challenge



- 0.5 – 5% loss/y
- Low quality fiber
 - Polymer
 - UV-resistance
 - Low quality tafting
 - Low quality backing

DRIVE – a system for O&M of sport facilities

DRIVE comes with an integrated knowledge portal, giving access to

- User manual for DRIVE
- An encyclopedia for management and maintenance of sport facilities
- Request for support and assistance
- Reporting of new ideas and functions of DRIVE
- Contact database to suppliers of products and services for maintenance of sport facilities



Further works

- **WP1 Sport**
 - Design for the users
 - Long term performance tests of pilot fields
- **WP2 System**
 - Operation and maintenance using DRIVE
 - Design and operation of sub terrain heating systems
 - Re-cycling of materials
 - Guideline for contracts: disposal, civil works, artificial turf installation
- **WP3 Environment**
 - Impact of salt on the environment during winter operation
 - CO₂ –footprint of systems
 - User exposure in indoor facilities

KG 2021

Thank you for your attention

Bjorn.aas@ntnu.no

<https://www.ntnu.no/siat/kunstgress2021>

www.godeidrettsanlegg.no

