
WANT THE MOST SUSTAINABLE SOLUTION?
ADD GENAN – ADD VALUE!
ADD VALUE

CARSTEN SIGVERT, MANAGER - TECHNICAL APPLICATIONS

Background:

- **Environmental Engineering graduate in 1987**
  - Wastewater treatment plants
  - Rainwater systems
  - Groundwater issues
  - Soil pollution
  - Etc.
- **GENAN since feb. 2014**
  - Commercial responsable for the Nordics until 1. may 2019
  - Environmental issues – Microplastics etc..
  - European Standardization work
  - LCA
  - R&D
  - Etc.

AGENDA

Facts on:

- Update on ELT (SBR)
- Microplastics
- Sustainability

No fake news or myths

ENVIRONMENT & HEALTH
HEAVY METALS

HEAVY METALS – migration/ leaching

- DIN 18035-7
- EN 71-3 cat3 (Toys for kids)

GENAN COMPLIES with all current regulations relevant for rubber granulate!

ENVIRONMENT & HEALTH
PAH - TOTAL EXTRACTION >< MIGRATION

TOTAL EXTRACTION only shows the content.

EXPOSURE / MIGRATION TESTING shows transfer to e.g. human skin – and thus the real risk, if any.

All analyses so far have concluded that there is **no elevated risk**. (Stated from ECHA)

MICROPLAST

The definition of plast is polymers that beside plastic are also rubber.

The limit of separation between macro- and microplastics is 5 millimetres. Everything under 5 millimetres is called MICROPLAST.

That is, infill is actually produced as microplast from the beginning.

DISCHARGE FROM DENMARK

Theoretical values:

Tyres	approx.	500 – 1.700	tons
Paint		37 – 570	tons
Shoes		10 – 260	tons
Wash of synthetic clothes		6 – 60	tons
Artificial football pitches		1 – 9*	tons
Microplast in care products		0.5 – 5	tons
Others		14 – 463	tons

Source: Miljøstyrelsen nr. 1793, 2015
** Source: Miljøprojekt nr. 2000, 2018*

NEW STUDIES

HOLLAND:	Hofstra, 2017
SWEDEN:	Magnusson, 2017 Wallberg, 2016 Regnell, 2017 Widström, 2017
NORWAY:	B. Bauer, 2018 Forskningskampanjen, 2017
DENMARK:	Lindberg, 2018 Kjølholt, 2018 Lassen, 2015
UK:	Flemming, Forrester & McLaren, 2015

WE HAVE BEEN MAPPING HOW 257 OUT OF 340 DANISH PITCHES IS CONSTRUCTED.

SPREAD THROUGH CLOTHES AND SHOES

DATA FROM NORWEGIAN SURVEY, 2017:

Based on records from 12.000 football players and 600 football matches, calculations show that **a total of 40 kg is removed per lane, per year** in the players' clothes and shoes.

Disposal on clothes and shoes is an obvious factor for the individual user. In a Big Bag with a tonne of rubber granulate, there is **approx. 12 million pieces of rubber granulate**. Up to 120 tonnes of infill is supplied for an artificial turf pitch.

REPORT FROM THE DANISH TECHNOLOGICAL INSTITUTE

The Danish Technological Institute has made a critical assessment of the mass balance of rubber granulate from artificial turf pitches, with a focus on loss to the nature in form of micro-rubber, particularly with a focus on discharges to the water environment.

Authors of the report:

- Hanne Løkkegaard, senior project manager
- Bjørn Malmgren-Hansen, senior specialist
- Nils Nilsson, senior specialist

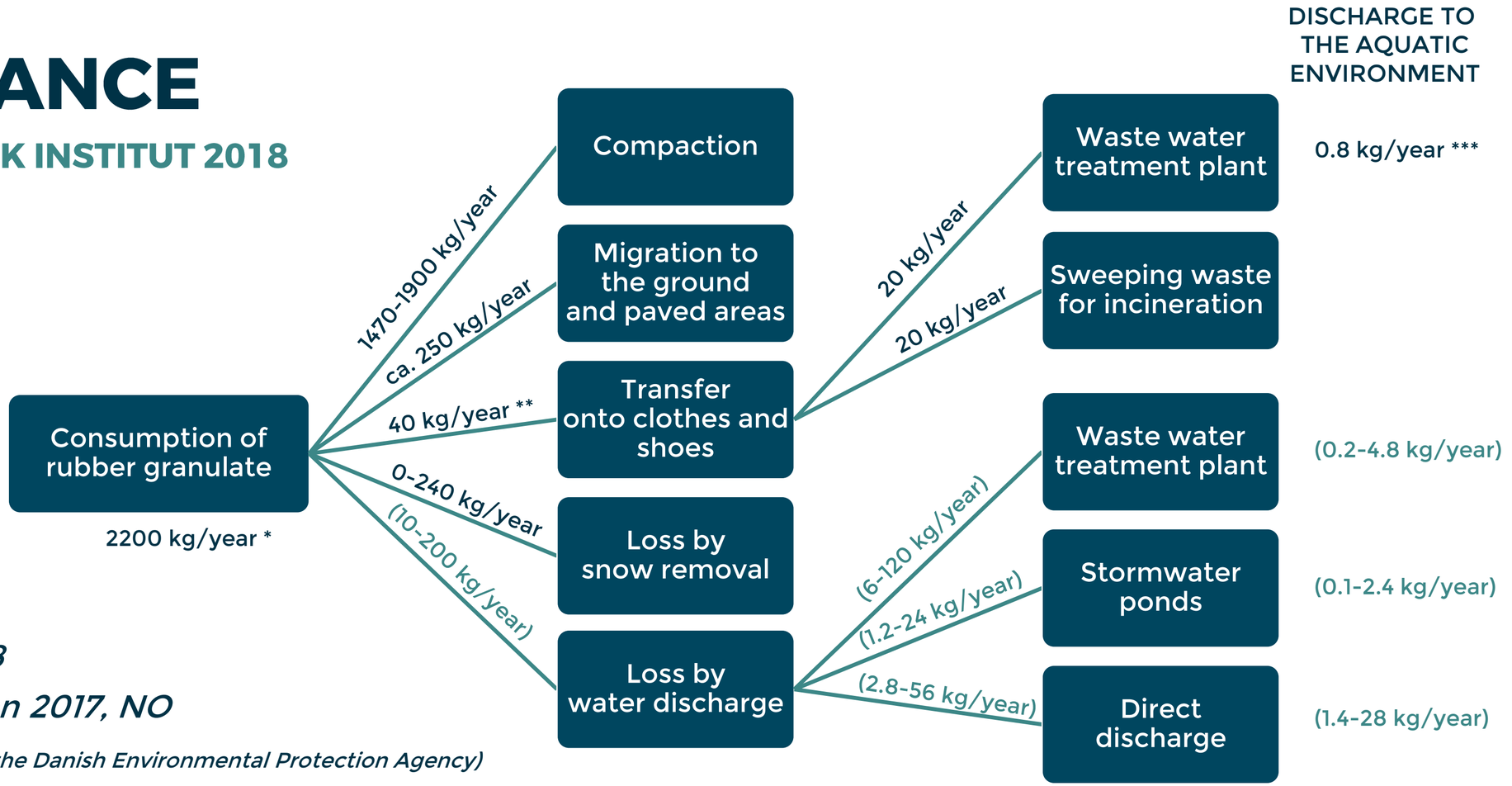
All high-ranking specialists in the field.

The report was published in December 2018.

MASS BALANCE

SOURCE: TEKNOLOGISK INSTITUT 2018

The discharge of microplastics from an artificial turf pitch to the aquatic environment is **2.5-36 kg a year**



* *Lindberg report 2018*

** *Forskningskampanjen 2017, NO*

*** *Miljøstyrelsen, 2015 (the Danish Environmental Protection Agency)*

HOW TO MINIMISE FUTURE SPREADING OF INFILL

- Drainage solution
- Behaviour and routines of maintenance personnel
- Behaviour and routines of players
- Infill fencing panels to retain granulate
- Clean-down area where clothes must be brushed off and shoes emptied

- **Optimum pitch construction limiting further spreading to the water environment.**
- **Optimum routines / habits of players and maintenance personnel are crucial.**

** Quotation from the ECHA website*

SUSTAINABILITY

Buss Words:

Carbon Foot Print

CO2 Balance

Circular Economy

Green House Gas

Life Cycle Assestment (LCA)

Much used in marketing without knowledge about the terms.

Can lead to ”GREENWASHING”!

Brundtland Commission

Famously definition of sustainable development:

” development that meets the needs of the present without compromising the ability of future generations to meet their own needs”

Three pillars of sustainability:

Environment – Economy – Society

These pillars need to be hooked up to

RISK-MANAGEMENT

THE END-OF-LIFE TYRE CHALLENGE

2012: **13.5 million tonnes** of tyres scrapped worldwide.

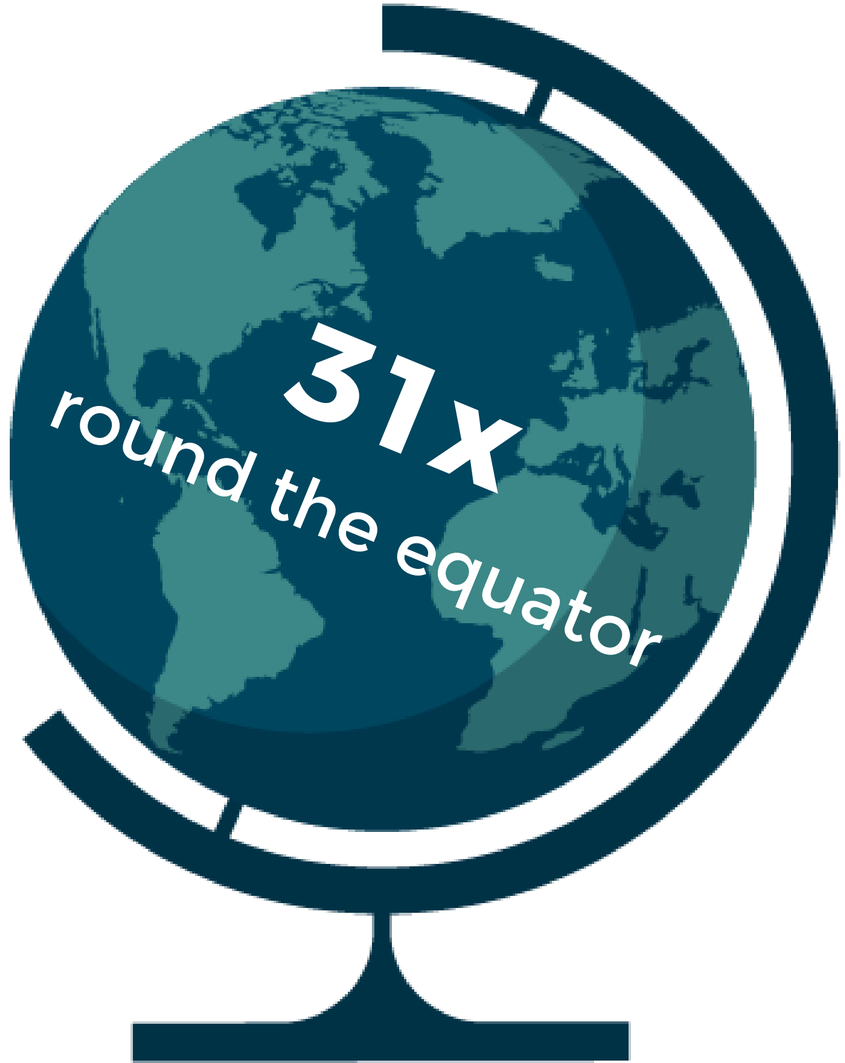
Laid flat and lined up, they would reach **22** times round the equator...

2017: **19 million tonnes** of tyres scrapped worldwide.

Laid flat and lined up, they would reach **31** times round the equator...

*The amount of tyres scrapped worldwide currently increases by approx. **4%** a year...*

The most soaring growth is seen in Asia.



PROBLEM OR OPPORTUNITY?

Problem:

- Waste
- Pollution and health risks
- Organised collection systems may not exist

Opportunity:

- New raw material
- CO_2 savings
- Legislation required to encourage true material recycling

LIFE CYCLE ASSESSMENT (LCA)

- Evaluates and measures all known environmental impacts of all steps of a specific choice in the complete life cycle of a particular product.

- The use of LCAs helps politicians make more informed decisions, and LCAs are thus an important factor in the decision-making process of public authorities.

- Genan has detailed documentation prepared by the most renowned experts, complying with ISO standards and including independent scientific peer review.

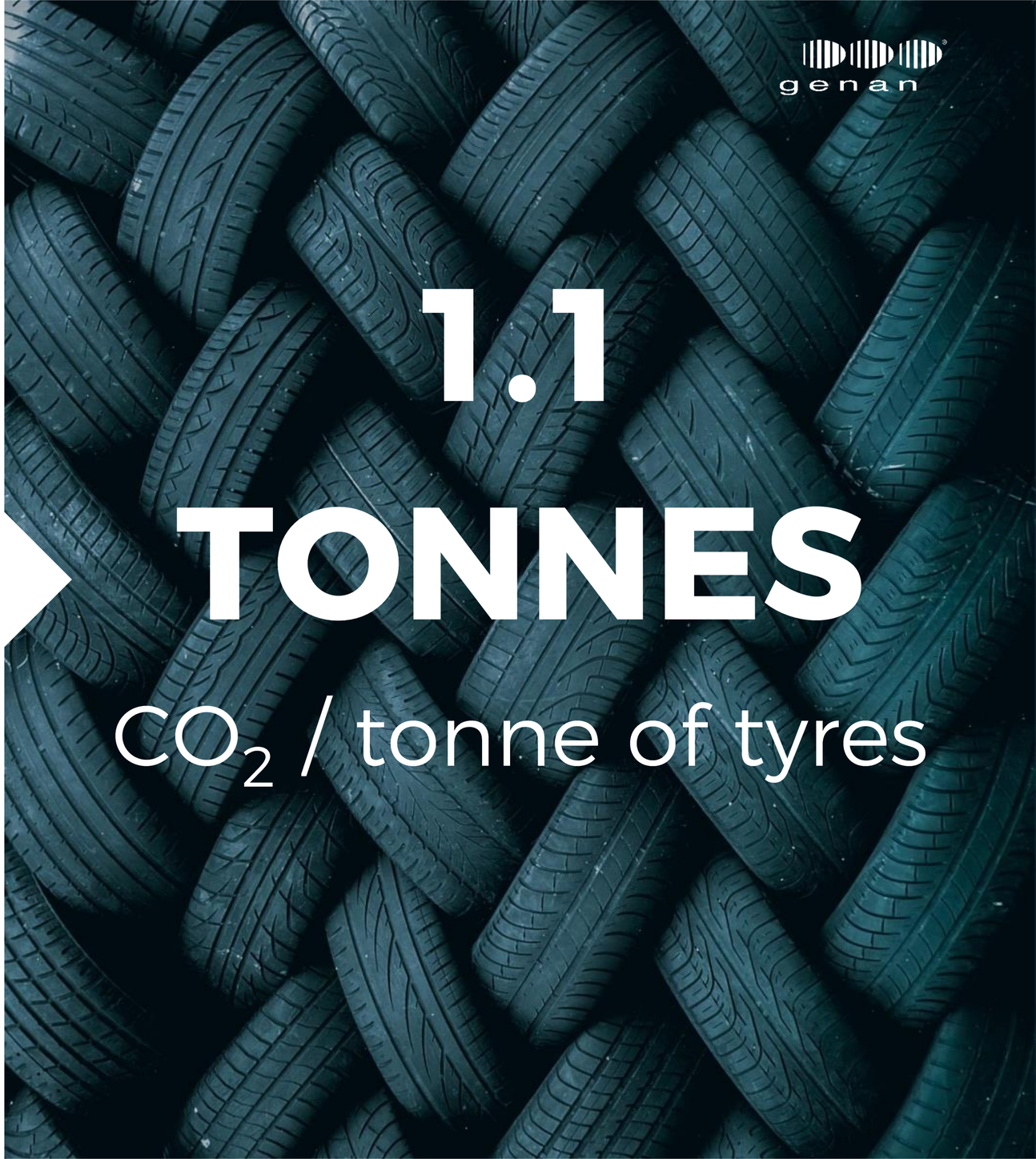
MATERIAL RECYCLING IS SIGNIFICANTLY MORE BENEFICIAL THAN CO-INCINERATION AND CIVIL ENGINEERING APPLICATIONS

MATERIAL RECYCLING
Compared to co-incineration

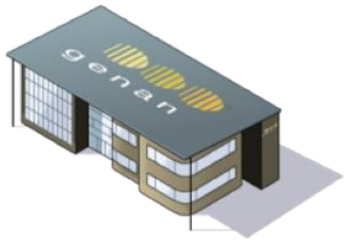
In comparison with co-incineration in cement kilns, significantly less greenhouse gas is emitted to the atmosphere when tyres are recycled.

According to the most conservative calculations, greenhouse gas savings total **1.1 tonnes of CO_2 per tonne of tyres**.

In Europe, more than **1,000,000 tonnes** of end-of-life tyres are incinerated each year. If these tyres were recycled instead, the climate would be spared of more than **1,100,000 tonnes of CO_2**.

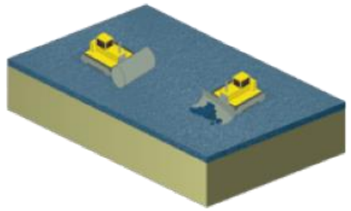


LCA CONCLUSIONS



Material recycling is by far the best available option.

Co-incineration in cement kilns is preferable to civil engineering applications and landfill.



Civil engineering applications are filling operations with no environmental benefits.

COMMUNICATIVE STATEMENTS

- For each tonne of tyres recycled by means of the Genan technology – instead of being incinerated – the environment is spared of a min. of **1.1 tonne of CO2**.

- For each tonne of e.g. rubber infill in artificial turf, where ELT rubber is used instead of EPDM or TPE, the environment is spared of 1.1/0.67 = **1.6 tonnes of CO2**.

- There are plenty of end-of-life tyres (ELT) in the EU, which are currently being incinerated in e.g. cement kilns (more than 1,000,000 tonnes per annum).
  If these volumes were instead recycled, the environment would be spared of **considerable CO2 emissions**.

- If key applications for ELT rubber should be blocked, the current alternative would be incineration – and consequently increased CO2 emissions.

MAKE YOUR CHOICE:

ON:
FACTS
PLAYABILITY
SUSTAINABILITY TOWARDS ENVIRONMENT, ECONOMY AND SOCIETY

NOT ON:
MYTHS
FAKE NEWS
EXCEL SCIENCE
EXAGGERATED PRECAUTIONARY PRINCIPLE

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THANK YOU FOR YOUR ATTENTION!

“

True recycling requires processing at a level where the output substitutes virgin materials.

Consequently this leads to avoided production and a profound saving of resources.

”

Don’t dump or burn a valuable resource!