EUROPEAN NO•DIG 2023 Conference ITALY

A-PLAST

Title: Next Environmental level for No Dig

Claes Wiger, MD A-liner, Sweden

25th May 2023

Can we do something?

PO river

Source: AFP

City Faenza

Source: AP

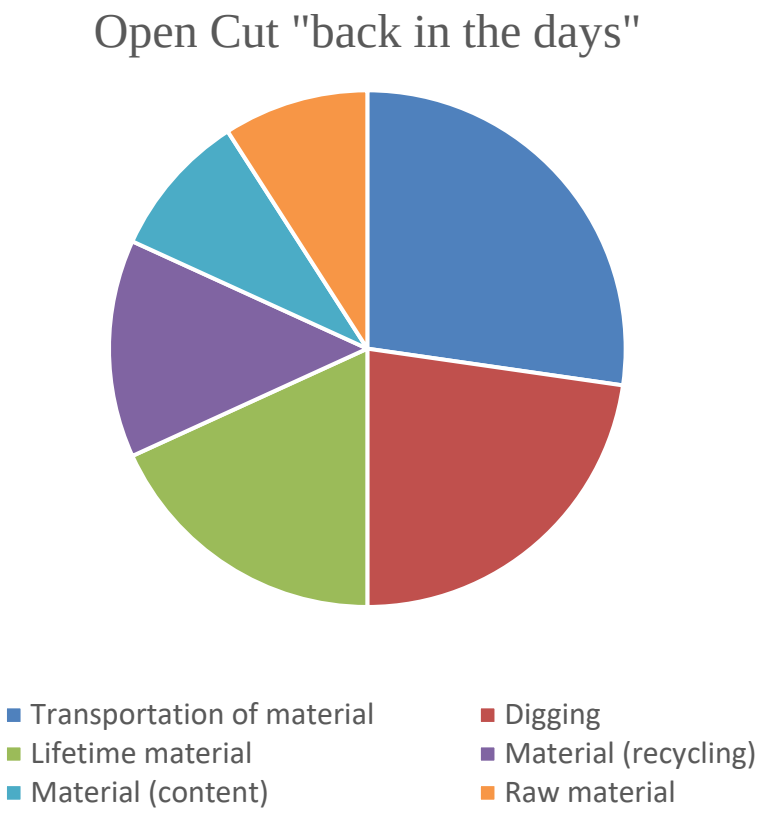
Spain

Source: Reuter

Portugal

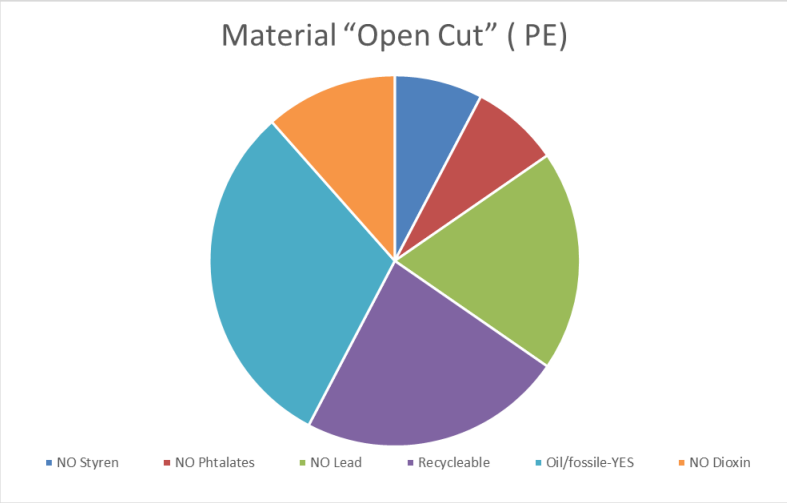
Source: AFP

- Transportation of material
- High consumption of fuel
- Fuel had lead and no klassification (e.g. sulfur nitrogen)
- Material was not recyclable
- Extraction of raw material was not optimized
- Lead and ftalathes (PVC)



Improvements ”open cut”

- Fuel is ”cleaner”
- Contractors can use electric energy
- Recycleable material
- BIO-based material
- No lead or ftlathes
- No styrene



No Dig still the winner

With ”No-Dig”

- No transportation of material (CO2)
- No digging impacts (CO2)
- Less traffic problems- less extra traffic

”Everybody” knows….

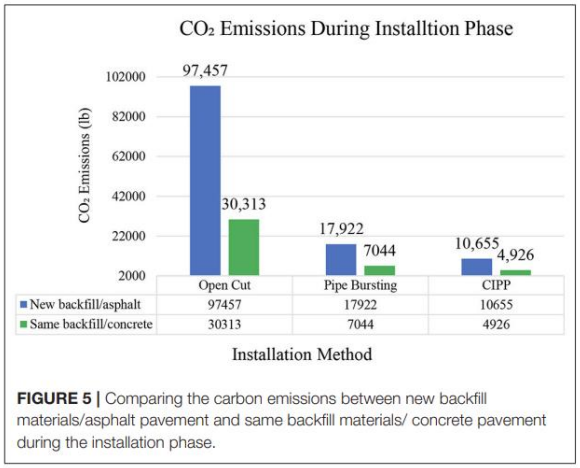
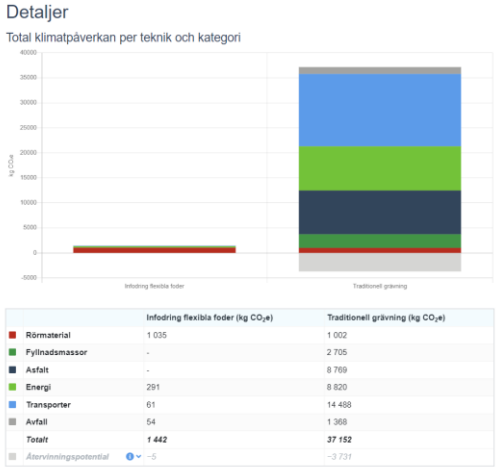


FIGURE 5 | Comparing the carbon emissions between new backfill materials/asphalt pavement and same backfill materials/ concrete pavement during the installation phase.

Source: Louisiana Tech University



Source: Klimatanalys Pollex

Target groupe NR 1 (communties)

- Price
- Organisation
- Environment!!

Example from Denmark

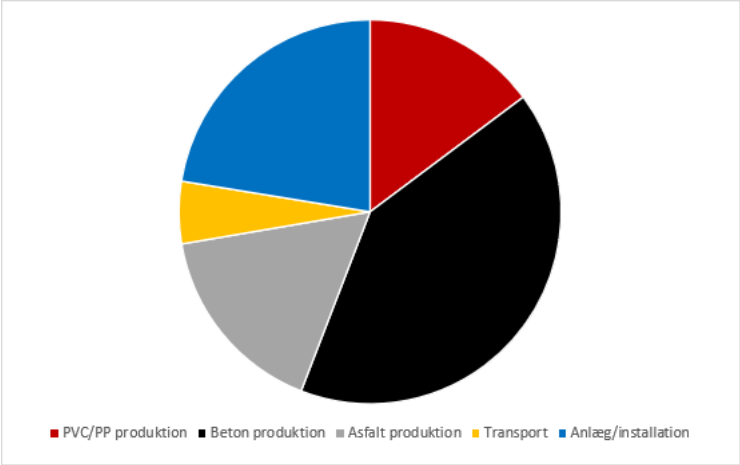
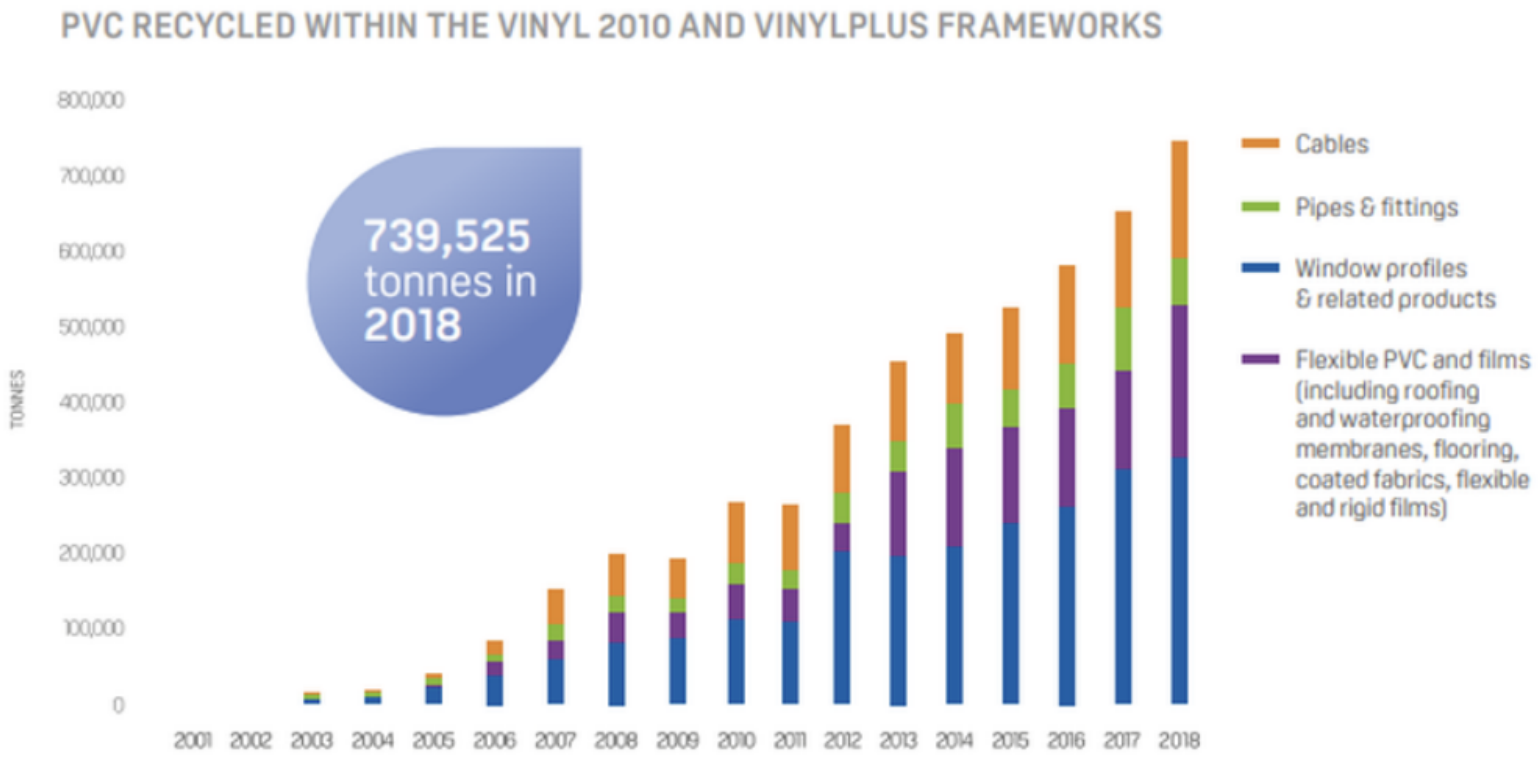


Figure 4. From Esbjerg community

PVC/PP-production (pipes <Ø500 + Ø600 chambers): 15 %
Concrete production (pipes >Ø500 + chambers > Ø600): 41 %
Asphalt tproduction: 16 %
Transport of material (sand, pebbles and cement for concrete production + transport from production to worksite): 6 %
Produktion on site (diesel for entrepreneur): 22 %

But what if……?


PVC RECYCLED WITHIN THE VINYL 2010 AND VINYLPLUS FRAMEWORKS
739,525 tonnes in 2018
TONNES
800,000
700,000
600,000
500,000
400,000
300,000
200,000
100,000
0
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Cables
Pipes & fittings
Window profiles & related products
Flexible PVC and films (including roofing and waterproofing membranes, flooring, coated fabrics, flexible and rigid films)

But what if……?

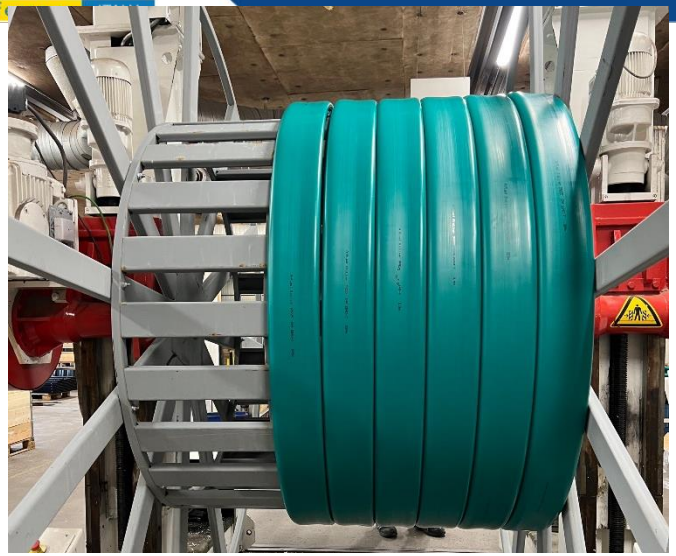
Styrene is regarded as a "known carcinogen", especially in case of eye contact, but also in case of skin contact, of ingestion and of inhalation, according to several sources.[20][33][34][35] Styrene is largely metabolized into styrene oxide in humans, resulting from oxidation by cytochrome P450. Styrene oxide is considered toxic, mutagenic, and possibly carcinogenic. Styrene oxide is subsequently hydrolyzed in vivo to styrene glycol by the enzyme epoxide hydrolase.[36] The U.S. Environmental Protection Agency (EPA) has described styrene to be "a suspected toxin to the gastrointestinal tract, kidney, and respiratory system, among others"

Source: Wikipedia 230515

But what if……?

	Standard verdi	Dokumentert verdi	Brukt faktor	Enhet
PE	2,37		2,37	kg CO_2 ekv./kg
PP	2,30		2,30	kg CO_2 ekv./kg
PVC	2,33		2,33	kg CO_2 ekv./kg
Betong	0,12		0,12	kg CO_2 ekv./kg
GRP	6,32		6,32	kg CO_2 ekv./kg
Støpejern	1,59		1,59	kg CO_2 ekv./kg
Rustfritt stål	5,13		5,13	kg CO_2 ekv./kg

Source: Norsk Vann october 2022



Facts BIO-liner

- 100% BIO BASED PVC raw material, SALT andWOODBASED RESIDUE

- CO2 footprint from BIO-PVC rawmaterial -**0,158 kg/kg**, certified by RSB/ISCC+
- CO2 from BIO-Liner 0,5 kg/kg (GRP=6 kg/kg)

- Styren free
- No Ftalates for softening, replaced by BIO material
- Ring stiffnes SN 4 or SN 8 tested acc to EN ISO 9969

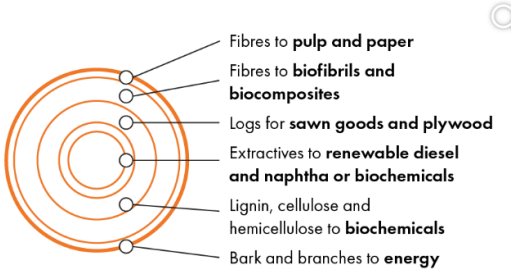
- Lifetime >100 years
- Dimension from DN 150 to DN 400

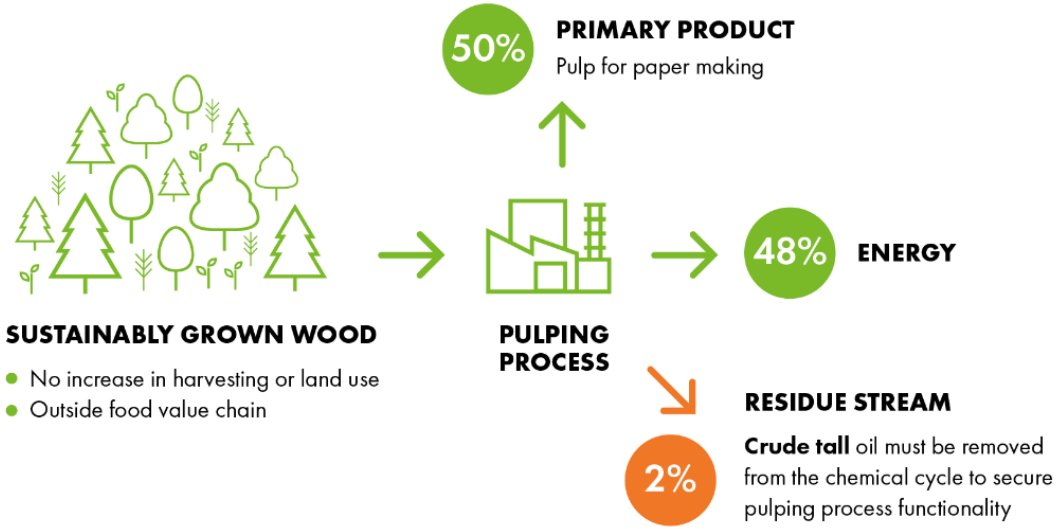
- Recycling accordig to SS-EN ISO 11296-3:2018

- Completly Made in Sweden with ISO 9001 and ISO 14001

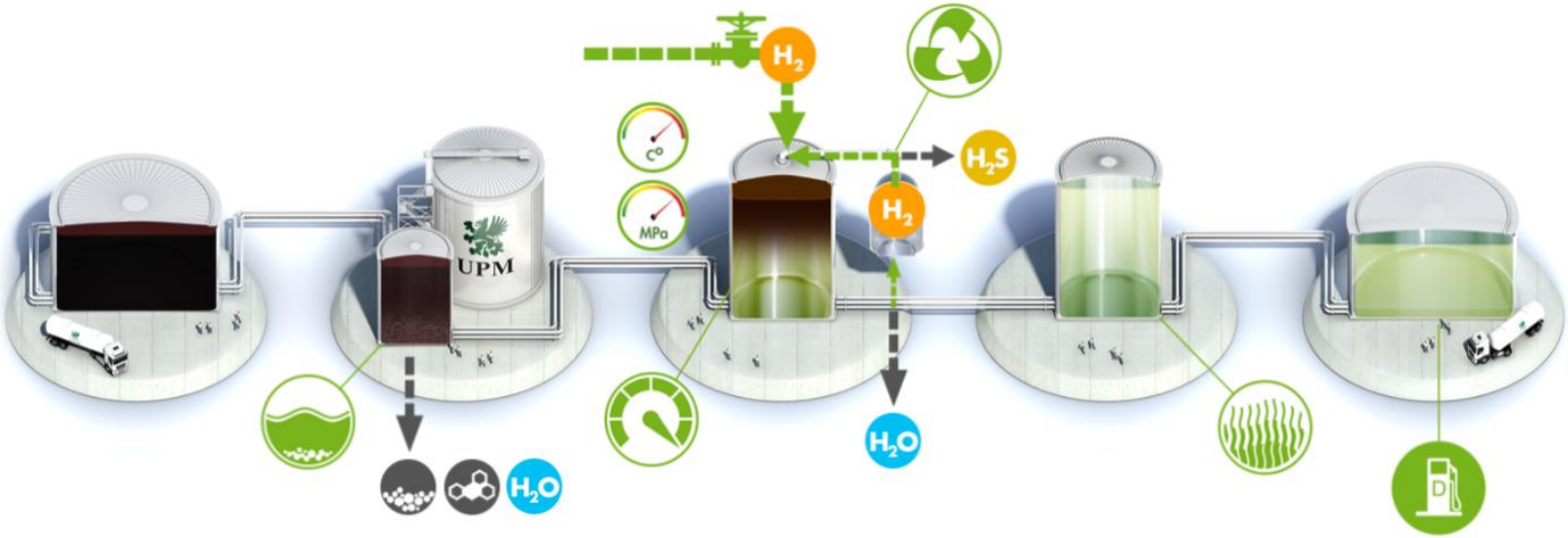
APPENDIX

HOW?


Fibres to **pulp and paper**
Fibres to **biofibrils and biocomposites**
Logs for **sawn goods and plywood**
Extractives to **renewable diesel and naphtha or biochemicals**
Lignin, cellulose and hemicellulose to **biochemicals**
Bark and branches to **energy**


50%
PRIMARY PRODUCT
Pulp for paper making
SUSTAINABLY GROWN WOOD
No increase in harvesting or land use
Outside food value chain
PULPING PROCESS
48%
ENERGY
RESIDUE STREAM
2%
Crude tall oil must be removed from the chemical cycle to secure pulping process functionality

HOW??



CRUDE TALL OIL

A residue of chemical pulping process containing natural extractive components of wood.

PRETREATMENT

Crude Tall Oil is purified: salts, impurities, solid particles and water are removed.

HYDROTREATMENT

Pretreated Crude Tall Oil is fed together with make-up and recycled hydrogen to the reactor where the chemical structure is modified. Reaction water is separated and directed to waste water treatment.

FRACTIONATION

Remaining hydrogen sulfide and uncondensable gases are removed. The remaining liquid is distilled to separate renewable diesel.

RENEWABLE DIESEL

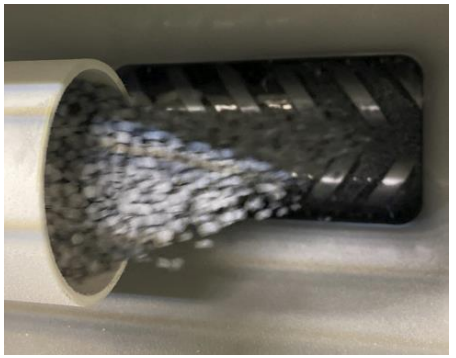
High quality advanced biofuel suitable for all diesel engines.

RENEWABLE NAPHTHA

Advanced renewable biocomponent for gasoline or raw material in bioplastics.

Recycling as it should work

Back to factory



biovyn
INOVYN bio-attributed PVC

RSB CERTIFIED

PROOF OF SUSTAINABILITY (PoS)

Product Name	BIOVYN™ PVC S6770	**Batch ID Number**	3084
Number of the Delivery Note		82042395	
Date of Shipment		27/02/2023	
Date of Issuance		29/03/2023	

SUPPLIER

SOLD-FROM	**SHIPPED-FROM**
INOVYN EUROPE LTD – SWEDISH BRANCH, 444 83 Stenungsund, Sweden	INOVYN Sverige AB, 444-83 Stenungsund, Sweden

CUSTOMER

SOLD-TO	**SHIPPED-TO**
Thevinyl AB *Fabriksgatan 5* *266 32 MUNKA LJUNGBY* *Sweden*	Thevinyl AB Fabriksgatan 5 266 32 MUNKA LJUNGBY Sweden

CERTIFICATION INFORMATION

Certification System	RSB Global
Valid RSB Certificate Number	SCS-RSB/PC-0032-EUR
Certification Body	SCS Global Services
Chain of Custody Model	Mass-balance with allocation principle, under RSB Category III Advanced Products

RSB SHORT CLAIM

This item is a 100% bio-attributed product certified to the RSB Standard for Advanced Products

GENERAL INFORMATION

Product Description	100% Bio-attributed PVC
Quantity of Certified Product	22500 kg
Raw Material	Renewable naphtha from crude tall oil
Country of Origin of the Raw Material	Finland, Sweden, USA

GREENHOUSE GAS (GHG) INFORMATION

GHG Intensity	Stenungsund S-PVC: -0.169 ($kgCO_2eq/kg$ PVC)		**GHG Savings**		Stenungsund S-PVC: 112%			
GHG value contains upstream transport emissions?	Yes ☒	No ☐	*If no*	**Transport**	N/A	**Distance**	N/A	

CO_2 Uptake	CO_2 sequestration was accounted for in the GHG intensity based on the stoichiometric C contained in the bio-naphtha used to produce the bio-attributed product. Note that the carbon emissions from the naphtha feedstock used as process fuel in the cracker (fuel gas production) as well as the carbon emissions associated with all of the upstream PVC manufacturing processes (Chlorine electrolysis / EDC / VCM / PVC polymerisation) were also accounted for in the GHG intensity of the bio-attributed product.

RSB MEMBER

Audrey Debande
Sustainability Business Development Manager

APPENDIX