



VinylPlus® PVC a cirkularni ekonomika

Zdenek Hruska, advisor to VinylPlus

VTP Kralupy nad Vltavou, 5/11/2024



ZÁVAZEK EVROPSKÉHO
PRŮMYSLU PVC K
UDRŽITELNÉMU ROZVOJI



**Created
in 2000**



**The EU PVC
industry**



**Commitment
to sustainable
development**



**EU-27, Norway,
Switzerland and
the UK**

A United PVC Value Chain

ZAKLÁDAJÍCÍ A SOUČASNÍ ČLENOVÉ VINYLPLUS



Resins

Stabilisers

Plasticisers

Converters

200 COMPANIES

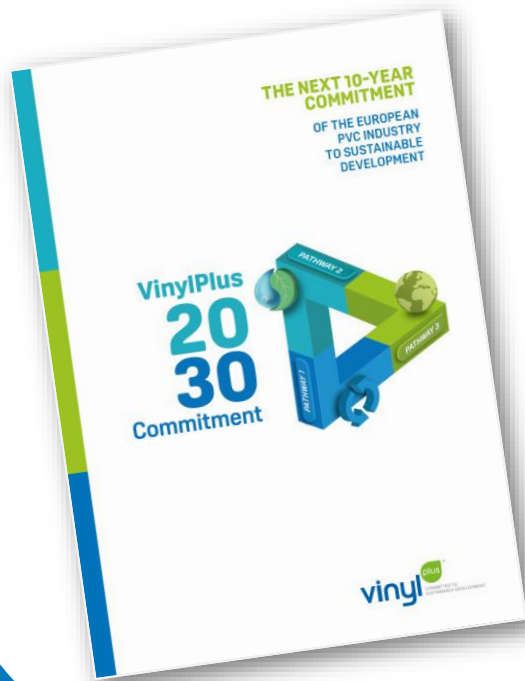


3 NATIONAL ASSOCIATE MEMBERS



recovinyl plus
150 recycler partners

VinylPlus 2030 Commitment



● 3 pathways, 12 action areas, 39 measurable targets



Circular Economy



Decarbonisation and Environmental Footprint Minimisation



Coalitions and Partnerships

● Independently **audited** yearly **Progress Reports**

● Overseen by a **Monitoring Committee**



VinylPlus Contribution to the UN SDGs



PROGRAM 2

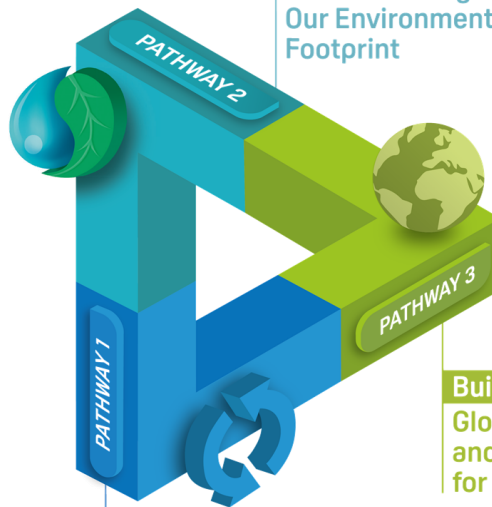
DEKARBONIZACE A MINIMALIZACE
EKOLOGICKÉ STOPY

VinylPlus
**20
30**
Commitment



Advancing

Towards Carbon
Neutrality
and Minimising
Our Environmental
Footprint



Scaling Up

PVC Value Chain
Circularity

PROGRAM 3

KOALICE A PARTNERSTVÍ

Building

Global Coalitions
and Partnering
for the SDGs



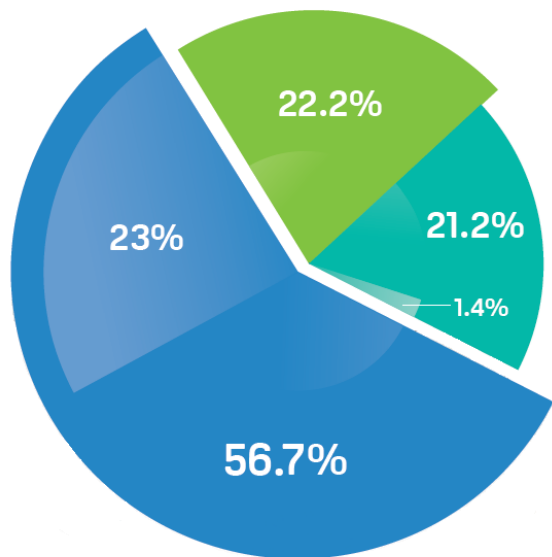
PROGRAM 1

OBĚHOVÉ HOSPODÁŘSTVÍ



VinylPlus Financial Investment

TOTAL EXPENDITURE IN 2023: €5.55 MILLION



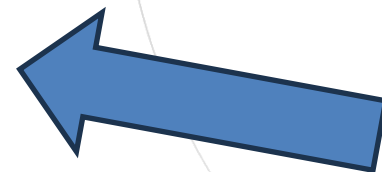
Overheads and Commitment development

Communications
(including national and sectoral co-funding, which amounted to 1.4% of total industry funding)

Waste management and technical projects
(including national and sectoral co-funding, which amounted to 23% of total industry funding)



Over €133 MILLION
invested in sustainability in
Europe since 2000



200 companies contribute to the VinylPlus budget

PATHWAY 1



#Oběhové hospodářství

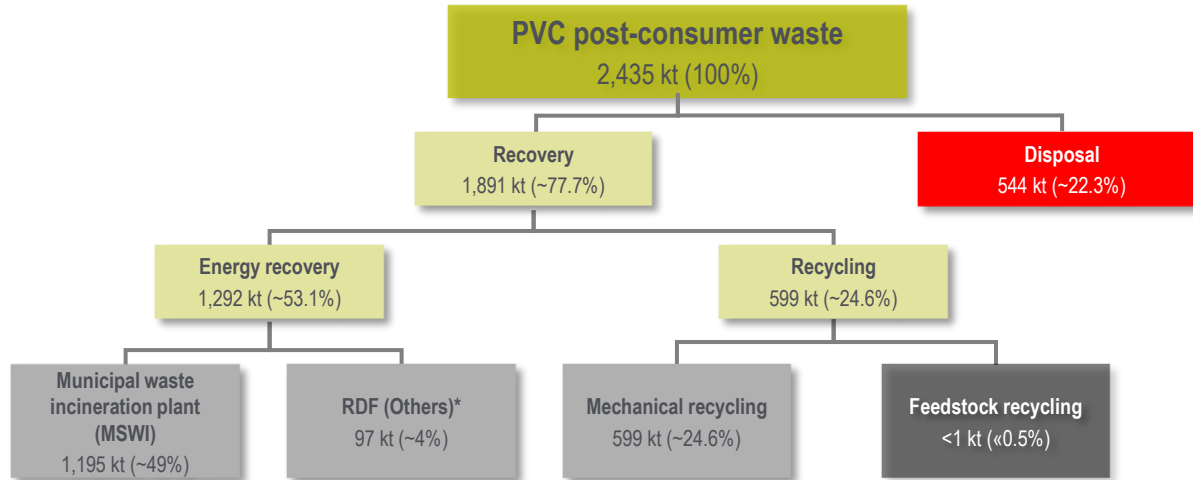
ROZŠÍŘENÍ OBĚHOVOSTI
HODNOTOVÉHO
ŘETĚZCE PVC

Circular Economy



Total overview PVC waste

Almost 600 kt PVC post-consumer PVC waste were recycled in 2020



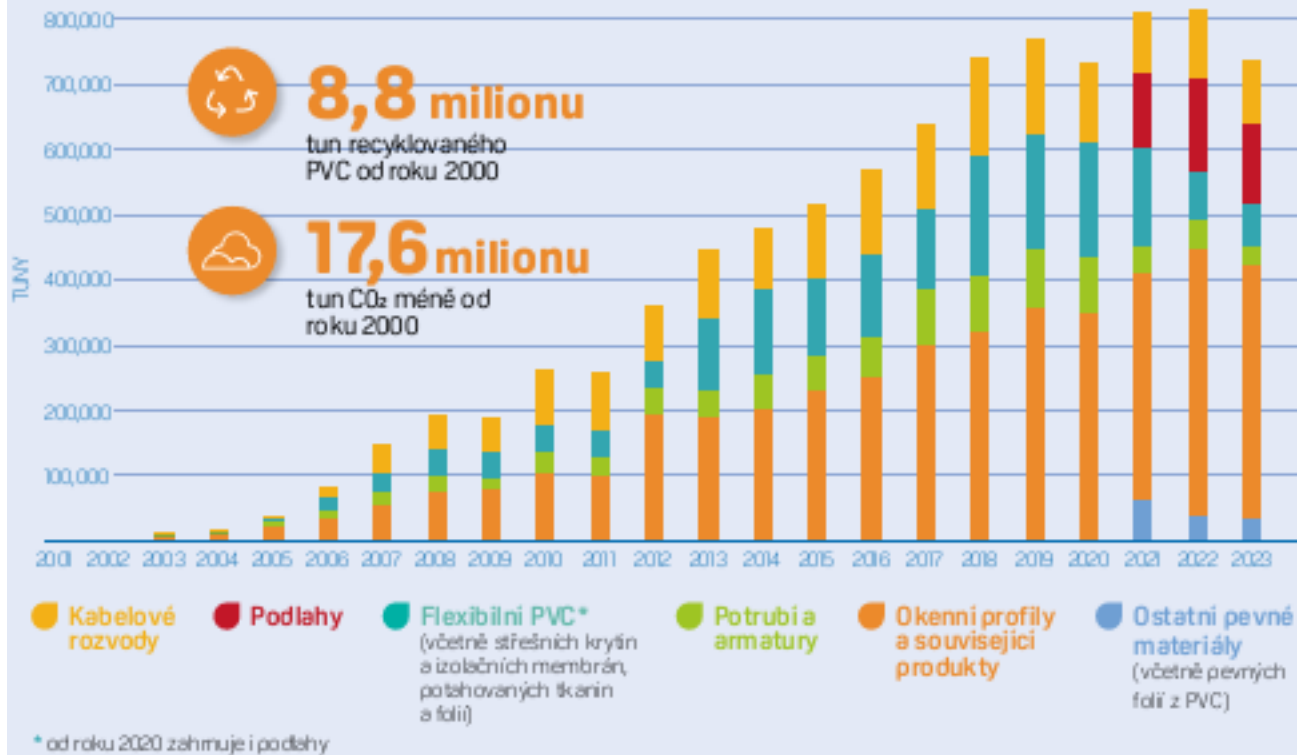
- Almost 78% of the European PVC post-consumer waste were recovered in 2020, about 22% were still landfilled.
- Related to the total quantity, almost 25% were recycled and 53% energy recovered.
- Energy recovery was mainly based on recovery in MSWI. Another - but significantly lower - quantity was also used in power plants or as waste derived fuel, etc.



Our Recycling Achievements

- V roce 2023 bylo recyklováno v rámci VinylPlus 737 645 tun odpadu PVC (24,3% celkového odpadu vyprodukovaného v EU, NO, CH and UK)
- 61.7% pre-consumer waste
- 38.3% post-consumer waste

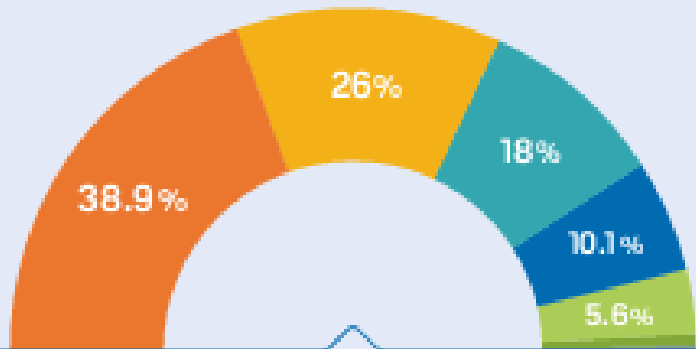
PVC RECYKLOVANÝ V RÁMCI INICIATIVY VINYLPLUS





Our Recycling Achievements

POUŽITÍ RPVC V ROCE 2023



- Okna a profily
- Podlahové krytiny
- Řízení provozu
- Potrubi
- Další použití ve stavebnictví
- Zahradnické a stájové vybavení (1.2%)
- Cívky a vřetena (0.2%)
- Balení (0.2%)



8.8 million
tonnes of PVC
recycled since 2000



17.6 million
tonnes of CO₂
saved since 2000



+ 1,500
direct jobs in
recycling plants



Research and Innovation for Circularity

- VinylPlus supports **technical projects, R&D and innovation** in three main areas:

Since 2000, VinylPlus investigated 31 different recovery options.



IMPROVE

existing collection and recycling schemes and set up new ones for additional PVC streams



SUPPORT

the development of chemical recycling and other recycling and sorting technologies



INVESTIGATE

solutions to detect, sort and remove legacy additives from end-of-life PVC products

31 DIFFERENT RECOVERY OPTIONS INVESTIGATED SINCE 2000



5 Conventional mechanical recycling with special features



2 Inclusion in other materials



3 Non-conventional mechanical recycling



7 Waste separation

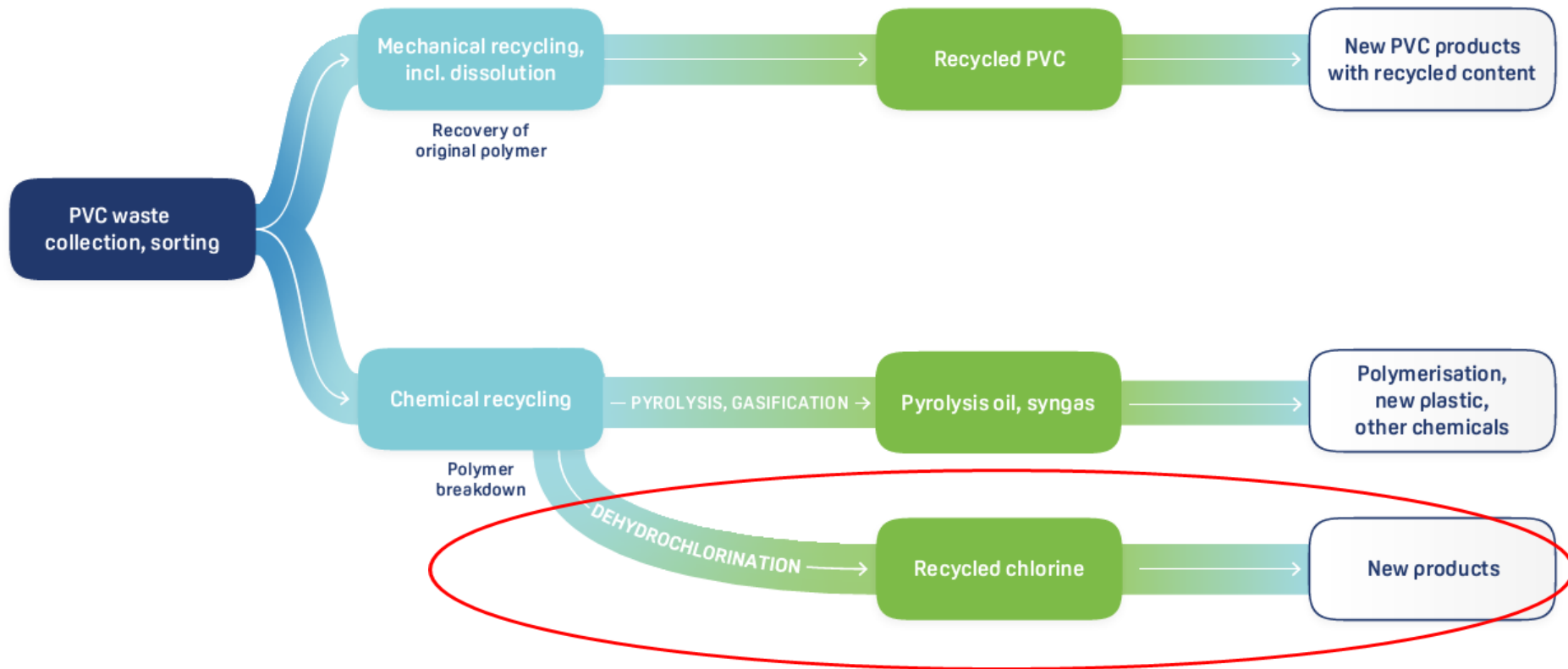


8 Feedstock recycling



6 Incineration with energy recovery and material recycling

Plastics circularity: all recycling technologies are required



CHEMICAL
RECYCLING -
RECOVERING AND
RECYCLING
CHLORINE FROM
END-OF-LIFE PVC

VinylPlus® RecoChlor

RecoSalt

RecoAcid



SOLVAir® neutralisation
process with sodium
bicarbonate

Water flue gas
scrubbing process

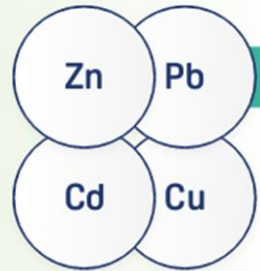


Waste-to-Energy plant

Resolest, Solval
RSC purification

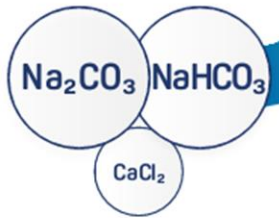
Recovery of Residual
Sodium Chemicals
(chlorides, sulphates, ...)

FLUWA process
Acidic filter ash leaching



Solvay process

Electrolysis

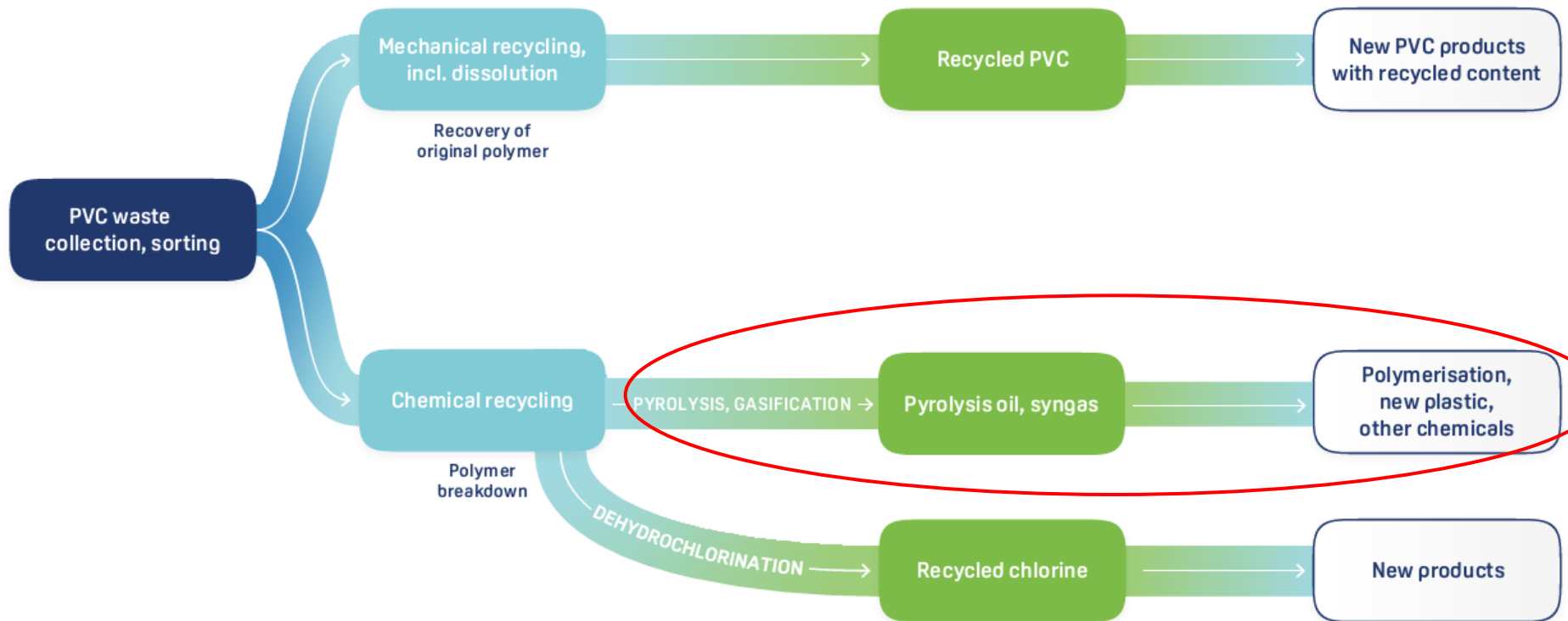


- g** gaseous
- s** solid
- aq** aqueous

VinylPlus Chemical Recycling of PVC – focus on chlorine

Project RecoChlor	Description	Status	Recognition
RecoSalt	Recovery of chlorine in W2E plants in the form of Residual Sodium Chemicals (mostly NaCl). After the purification, the brine is used to produce new chemicals such as NaHCO ₃ , Na ₂ CO ₃	Mature technology, applied in EU	Recognized as recycling operation in BAT document for waste treatment ¹
RecoAcid	<p>Recovery of chlorine in W2E plants in the form of HCl, and its use to recycle metals. Some recovered metals belong to Critical/Strategic Raw Materials (e.g. Sb, Cu, Ni) identified by the EU Commission</p> <p>Great replication potential - plants operating fly ash washing in Germany, Czech Republic, Denmark, Sweden</p>	<p>Advanced project, supported by Swiss authorities</p> <p>Larger scale trials are foreseen in 2024. Focus on heavy metal transfer from bottom ash to fly ash, mass balance</p>	<p>The process will be obligatory in Switzerland from 2026</p> <p>13 FLUWA plants in CH (by 2025)</p>

Plastics circularity: all recycling technologies are required



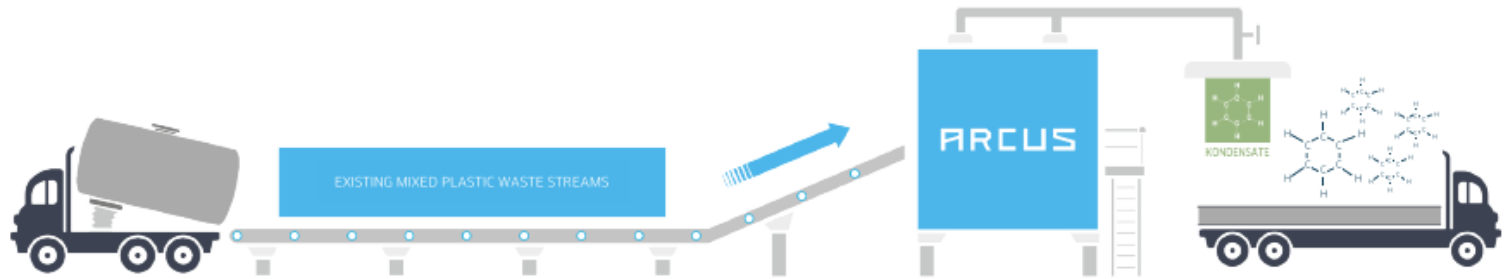
VinylPlus Chemical Recycling of PVC – focus on hydrocarbon part

Project	Description	Status	Recognition
Arcus Greencycling Technologies GmbH (https://arcus-greencycling.com/)	<p>The Arcus technology recycles existing waste streams into pyrolysis oil for the petrochemical industry</p> <p>Technology proven to process non-recyclable mixed plastics waste with PET, EPS, and PVC (up to 10%). Avoiding discrimination of PVC in mixed plastics waste feedstock ..</p>	<p>High TRL – fully authorised and certified (REACH, EfB, ISCCV+, RedCer2, BimSch) chemical recycling facility in Industrial Park Höchst in Frankfurt</p> <p>Running reactor of 4,000 t/a plastics waste capacity with >2000 hours operations, fully engineered and replicable to scale up</p>	<p>Pyrolysis oil approved with large number of relevant petrochemical players</p>

VinylPlus Chemical Recycling of PVC – focus on hydrocarbon part

■ ARCUS

Arcus-technology recycles existing waste streams into “in-spec” pyrolysis oil for the petrochemical industry



Existing currently incinerated **waste streams** without secondary pre-sorting

Close to energy-self-sufficient **pyrolysis process** circulating operating media

‘In-spec’ oil, usable gas and environmentally harmless solids

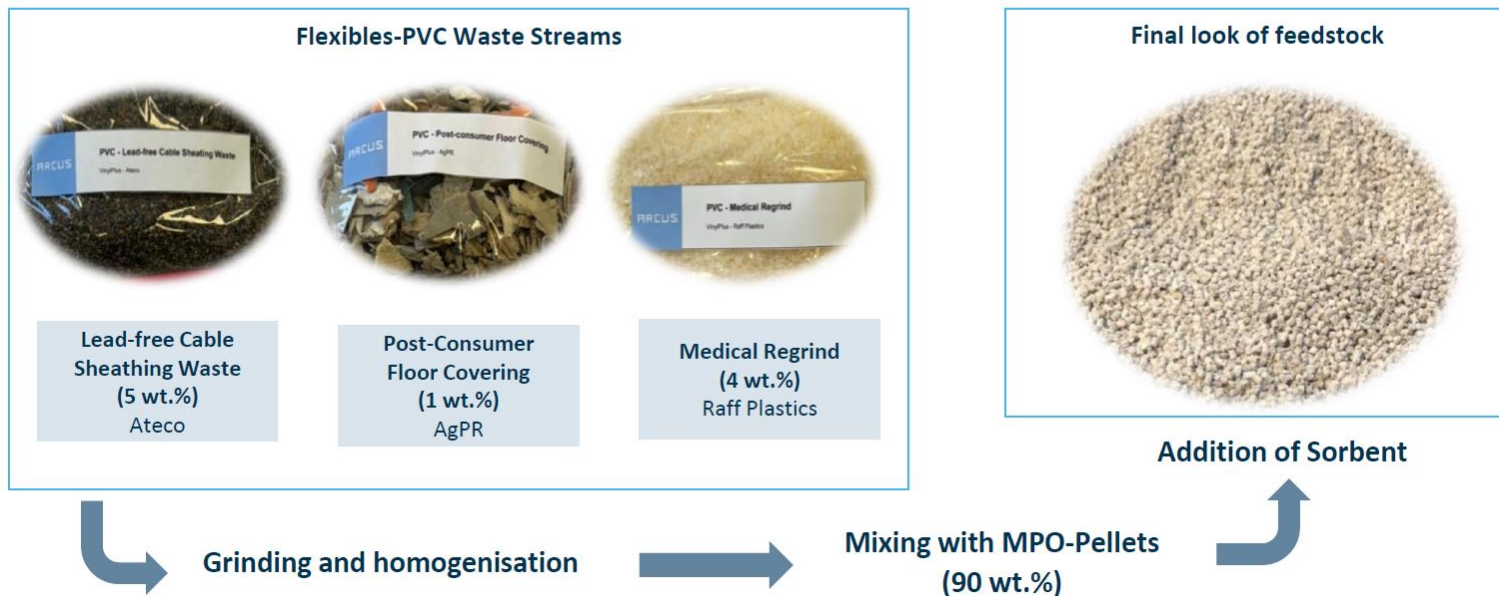
Including up to **10%** PVC

<https://arcus-greencycling.com/>



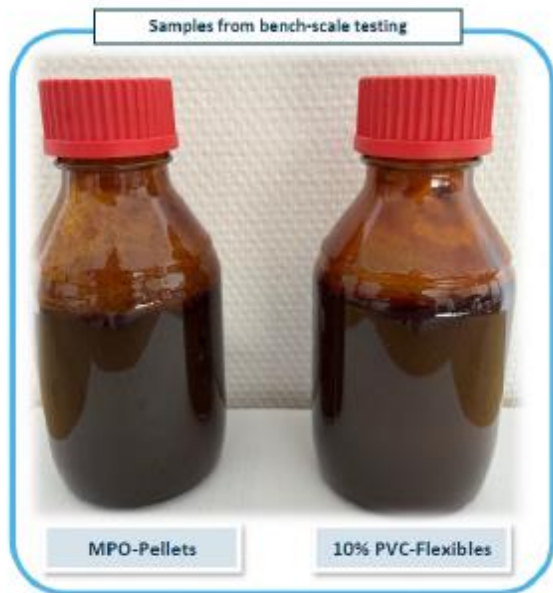
CHEMICAL RECYCLING - RECOVERING AND RECYCLING CARBON FROM END-OF-LIFE PVC

Homogeneous feedstock through grinding, mixing and sorbent addition





CHEMICAL RECYCLING - RECOVERING AND RECYCLING CARBON FROM END-OF-LIFE PVC



SUCCESSFUL PRODUCTION OF PY OIL AT BENCH SCALE

- ✓ Excellent chlorine removal from Py Oil (99,8 %)
- ✓ No indication of major differences between Py Oils



CHEMICAL RECYCLING - RECOVERING AND RECYCLING CARBON FROM END-OF-LIFE PVC



Höchst Chemie Park, Frankfurt am Main, Germany



Innovative Projects

DETECTING AND SORTING LEGACY ADDITIVES

- NIR (Near Infrared) technology
- XRF (X-ray fluorescence spectroscopy) technology

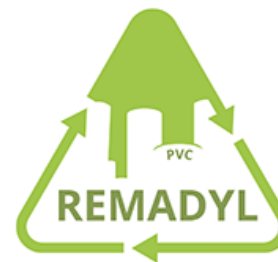


WASTE RECYCLING PROJECT

REVINYLFLOOR

REDUCING AND REMOVING LEGACY ADDITIVES

- **Aim:** the continuous extraction of DEHP and Lead-based stabilisers from selected end-of-life PVC waste streams



PATHWAY 2



PROGRAM 2

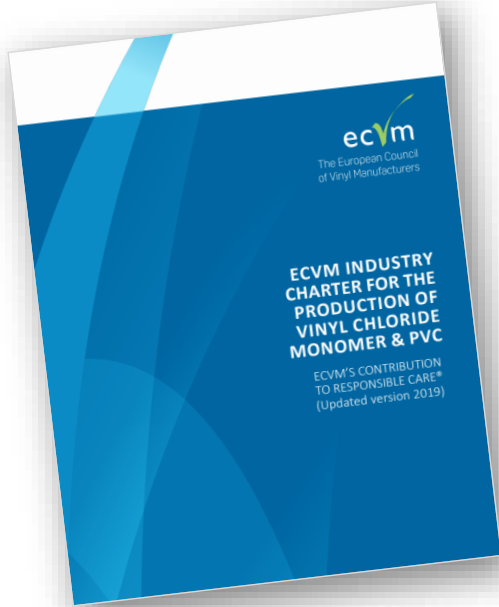
DEKARBONIZACE A MINIMALIZACE
EKOLOGICKÉ STOPY

Decarbonisation and Environmental Footprint Minimisation

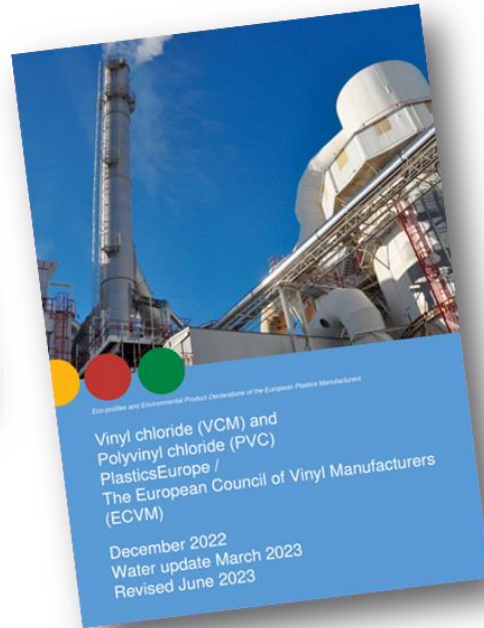




Minimising our Environmental Footprint



- The [ECVM Industry Charter](#) aims at minimising all environmental impacts in the production phase. It was updated in 2019.



- An updated [eco-profile](#) quantifying the average cradle-to-gate environmental impacts of the production of [VCM](#) and [PVC](#) by the ECVM members was published in December 2022.



Embracing the Sustainable Use of Chemical Substances

Proactive assessment of sustainable production and use of PVC additives throughout entire product lifecycles



 The Natural Step



Developed in collaboration with The Natural Step, the ASF tool helps to assess the long-term sustainability of formulations.



It has been successfully applied by the window profile industry and tested by the flooring industry.



The methodology has been peer-reviewed and validated by LCA experts, and it is open access.



Supports the identification and use of sustainable additives in the value chain and helps additive producers to improve the sustainability of their products.



Minimising our Environmental Footprint

Více informací najdete



↓ ve zprávě VinylPlus
o pokrocích za rok 2024.

www.vinylplus.eu

Všechny uváděné informace
byly ověřeny nezávislým auditem
a potvrzeny třetími stranami.

PATHWAY 3



#Koalice a partnerství

VYTVÁŘENÍ
CELOSVĚTOVÝCH
KOALIC A PARTNERSTVÍ
PRO DOSAŽENÍ CÍLŮ
UDRŽITELNÉHO
ROZVOJE

Coalitions and Partnerships





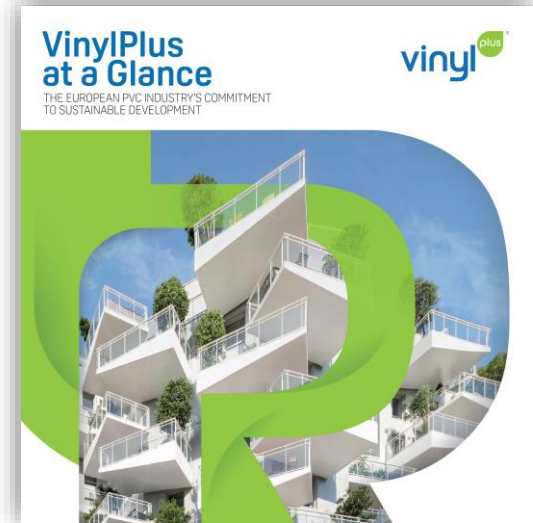
Coalitions and Partnerships

ENSURING TRANSPARENCY AND ACCOUNTABILITY



PROGRESS REPORT 2024

www.vinylplus.eu/resources/progress-report-2024



VINYLPLUS AT A GLANCE

www.vinylplus.eu/resources/vinylplus-at-a-glance-2024



TRANSPARENTNOST A ODPOVĚDNOST

VinylPlus ve Zkratce

ZÁVAZEK EVROPSKÉHO PRŮMYSLU PVC K UDRŽITELNÉMU ROZVOJI



ZÁVAZEK EVROPSKÉHO PRŮMYSLU PVC K UDRŽITELNÉMU ROZVOJI

KDO JSME



200 společností produkujících a zpracovávajících PVC pryskyřici a aditiva



Působíme ve 27 ZEMÍCH EU, v Norsku, Švýcarsku a Spojeném království



Sít přibližně 150 recykátorů



Od roku 2000 v Evropě investováno do udržitelnosti přes 133 Milionů Eur

PVC, jeden z nejpoužívanějších polymerů na světě, se uplatňuje v řadě odvětví, jako jsou například:

- Stavebnictví
- Automobilový průmysl
- Kabelové rozvody
- Zdravotnictví
- Volný čas a luxusní zboží
- Běžné aplikace

NÁŠ PLÁN DO ROKU 2030



Pokrok směrem k uhlíkové neutralitě a minimalizaci naší ekologické stopy

VinylPlus 2030

Compromiso Voluntario



Vytváření
obsluhových koalic a partnerství pro dosažení cílů udržitelného rozvoje

Rozšíření
oběhové a hodnotového řetězce PVC



SVENJA SCHULZE
německá spolková ministryně pro hospodářskou spolupráci a rozvoj

Potřebujeme dosáhnout zásadní transformace ekonomiky – opatření v oblasti klimatu, oběhové hospodářství a sociální spravedlnost by měly být ústředním aspektem našich ekonomických aktivit.

Požadujeme i závazky soukromého sektoru, jako je například zapojení iniciativy VinylPlus. Velmi důležité je váš závazek k využívání udržitelného materiálu, k větší míře recyklace a k redukci odpadu.



Certified and Traceable Products

The VinylPlus® Product Label – for converters

The VinylPlus® Supplier Certificates – for additives producers and compounders

THE VINYLPLUS SUSTAINABILITY CERTIFICATIONS
COMMUNITY CONTINUES TO EXPAND



> **500** products
and product systems
manufactured at



18
companies certified



29
European sites



Engaging with Stakeholders - examples

- VinylPlus - an observer organisation to the United Nations Environment Programme (UNEP)
- VinylPlus - participant in the work of the **Third** and **Fourth sessions of the Intergovernmental Negotiating Committee** to develop an international legally binding instrument on plastic pollution (INC-3 and INC-4) in Nairobi, Kenya, November 2023 and in Ottawa, Canada, in April 2024.
- VinylPlus - partner of the Plastic Pavilion at the **World Congress of Architects 2023**, in Copenhagen (DK)



Intergovernmental Negotiating Committee on Plastic Pollution



Partnering for Circularity



FROM SINGLE-USE MEDICAL DEVICES TO DURABLE HOSPITAL WALL COVERING

Single-use medical device



Collection after use



High-quality regrind



Wall covering for healthcare



29 HOSPITALS
35 ON WAITING LIST





Engaging with Stakeholders

- ↓ The **12th VinylPlus Sustainability Forum – *Together Towards Higher Ambitions*** – took place in Cologne, Germany, on 23 May 2024.
- The event gathered over 195 delegates from 22 countries.
- The **VSF2024** debated how the European PVC industry works jointly with policymakers and industry partners **towards meeting EU and global ambitions**. The discussion also put the spotlight on the PVC value chain's efforts to find solutions **towards advancing circularity ambitions** and **towards minimising its environmental footprint**.

VSF 2025 – 21-22 MAY in PARIS



Progress Report 2024

To know more on
VinylPlus, go to
vinylplus.eu





 www.vinylplus.eu

 info@vinylplus.eu

 [vinylplus_eu](https://twitter.com/vinylplus_eu)

 [vinylplus](https://www.linkedin.com/company/vinylplus)

 [vinylplus](https://www.youtube.com/vinylplus)