

Radici Group & Sustainability



SUSTAINABLE DEVELOPMENT TO US

1997: GLOBAL THINKING, LOCAL ACTION

2003: RESPONSIBLE CARE PROTOCOL

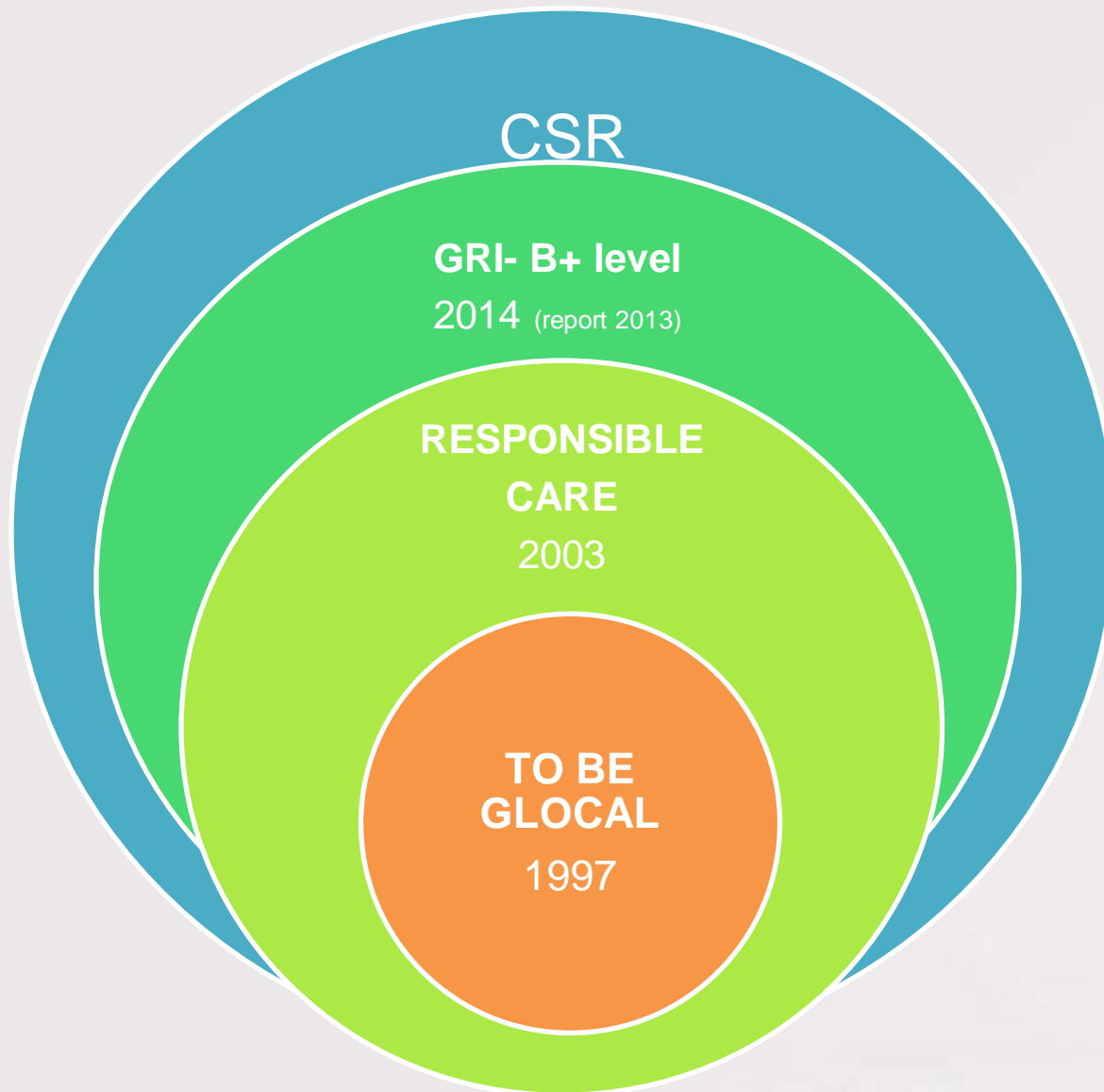
2004: 1° PUBLISHED SUSTAINABILITY REPORT

2010: RADICIGROUP FOR SUSTAINABILITY PLAN

2011-2013: GLOBAL REPORTING INITIATIVE
LIFE CYCLE ASSESSMENTS
PRODUCT CATEGORY RULES

2013-2014: PCR and ENVIRONMENTAL
PRODUCT DECLARATION

TOWARDS CORPORATE SOCIAL RESPONSIBILITY (CSR)



SUSTAINABILITY STEPS



ORGANIZATION MODELS

ISO 9001, ISO-TS 16949, ISO 14001, OHSAS 18001



- GLOBAL REPORTING INITIATIVE



KYOTO PROTOCOL PRINCIPLES (20-20-20+20% recycled)

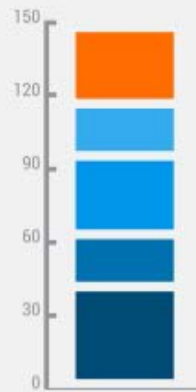


PRODUCT CERTIFICATIONS

- EPD Process Certification



Our Sustainability Reports, certified by independent organizations, are based on globally-recognized standards set by GRI (Global Reporting Initiative)



RADICIGROUP FOR SUSTAINABILITY REPORT KEY ELEMENTS



***We cooperate with
international associations to
measure and report the
environmental impact of
products***



Eco-profiles and Environmental Product Declarations of the European Plastics Manufacturers

Polyamide 6.6 (PA6.6)
PlasticsEurope
February 2014

PlasticsEurope
Association of Plastic Manufacturers

Producer Description

PlasticsEurope Eco-profiles and EPDs represent European industry average as the issuing trade federation. Hence they are not attributed to any single plastics industry as represented by PlasticsEurope's membership and the Eco-profile data collection. The following companies contributed data to

- BASF
- DuPont
- Radici
- Solvay



operation twenty⁴

*We promote BAT and
plant efficiency...*

RadiciGroup sustainable development strategy for 2010-2012

-20%



A reduction in greenhouse
gas emissions of at least
20% below 1990 levels.

+20%



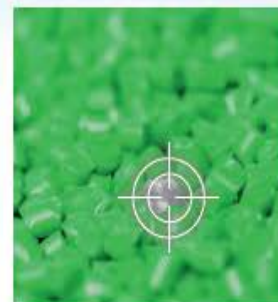
20% of energy
consumption to come
from renewable sources.

-20%



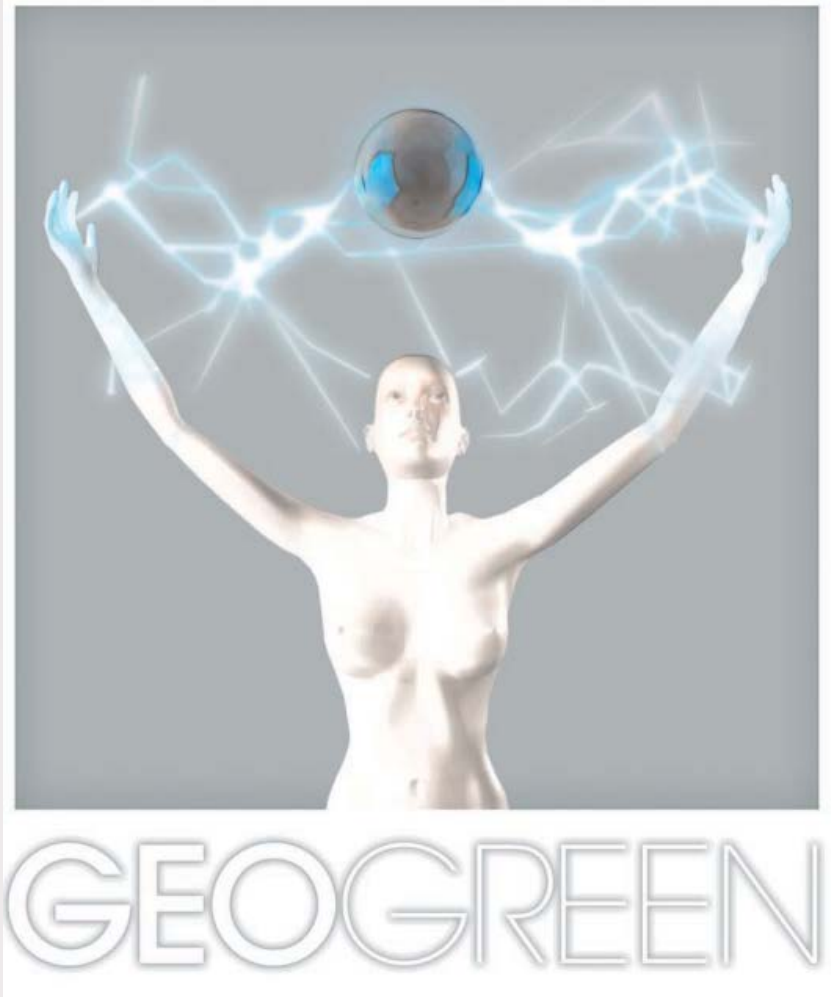
A 20% reduction in primary
energy use compared with
projected levels.

+20%



A 20% increment
in recycled materials.

.....
***...investing in hydropower
to supply energy from
renewable sources to the
manufacturing plants of
Radici Group***



operation twenty⁴

We promote BAT and plant efficiency...

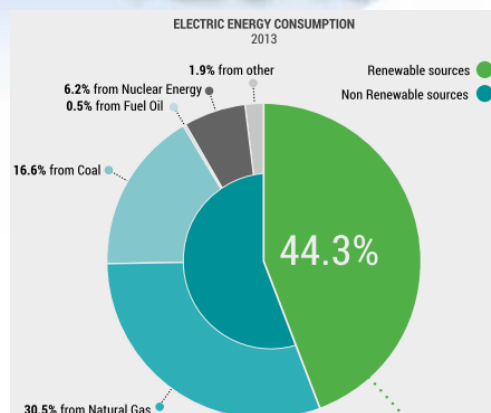
RadiciGroup sustainable development strategy for 2010-2012

-20%



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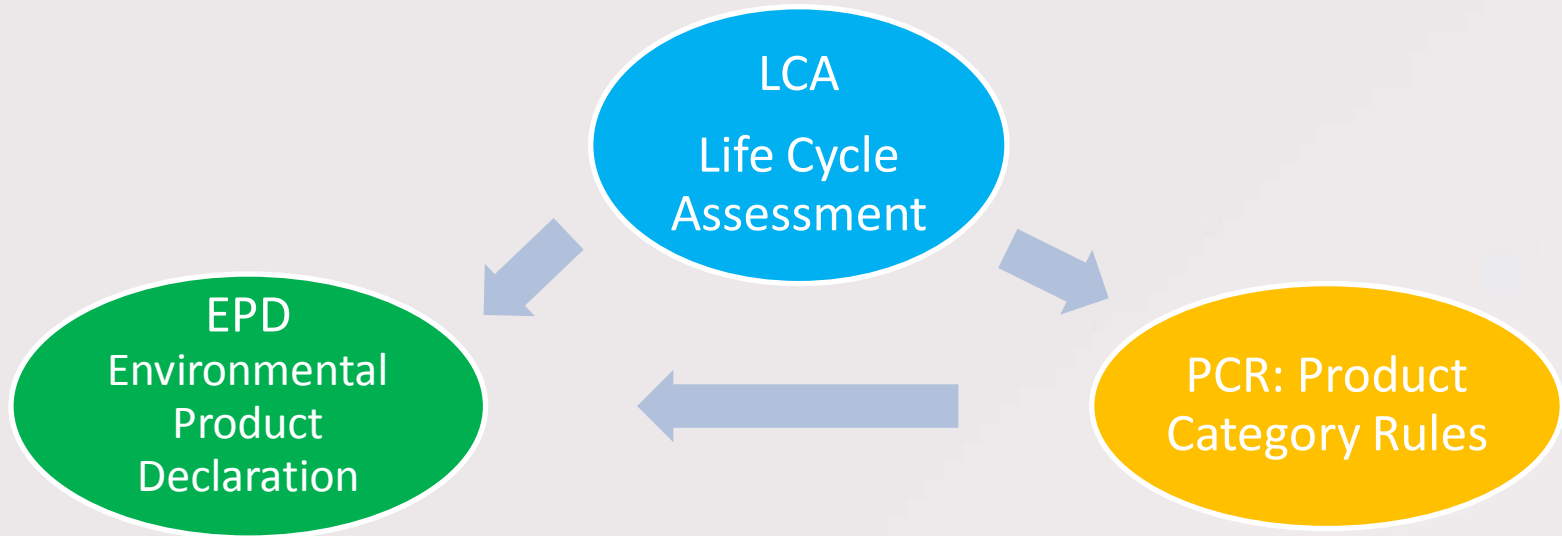
***How to put all that
together***



"GREEN" labels ?



Environmental Accounting of Products and EPDs

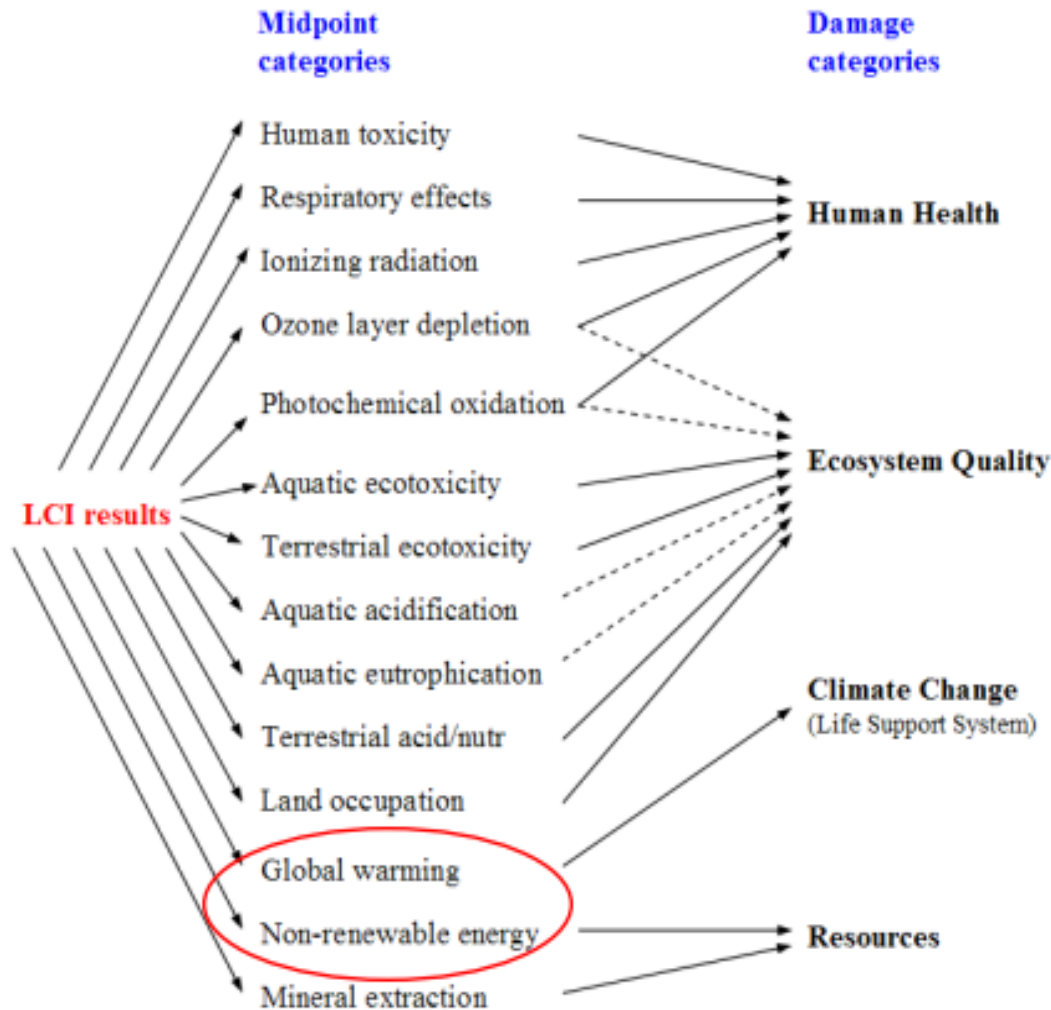


Life Cycle Assessment-LCA (ISO 14040 series) a methodology/tool for the analysis of the environmental burden of products

PCRs -Product Category Rules: a set of rules for developing EPDs, representing the product and the production process. General Programme Instruction to draw up **PCRs are issued by an independent Operator** who administers the system.

EPD - Environmental Product Declaration, a “Type III” product environmental label (**Third-party check – ISO 14025**)

Key word : LCA Life Cycle Assessment



*A scientific tool:
Life Cycle
Assessment (LCA)*

LCA assess the **environmental burden** of products.

In **comparative Life Cycle** studies it is **not the products themselves** that form the basis for comparison **but the function provided** by these products.

Different products, with **similar technical performance**, that can be used for the same application will then be **compared** according to **LCA metrics**

Key word : PCR - Product Category Rules

RadiciGroup, through the Sweden-based **International EPD System**, hasdefined internationally accepted **PCRs** (Product category Rules), **an international reference point and model for any company in the industry that wants to measure the environmental impact performance of its production chain products.**

This was a significant achievement for RadiciGroup. Indeed, the Group was the first multinational to present and propose the concept **of a production chain PCR.**

RADICIGROUP COOPERATE TO :

- PCR CPC 8942 “NON METAL WASTE AND SCRAP RECOVERY (RECYCLING) SERVICES”
- PCR CPC 347 “PLASTICS IN PRIMARY FORMS”
- PCR CPC 355 “MAN MADE FIBRES - FILAMENT OR STAPLE”

Key word : PCR - Product Category Rules

PRODUCT CATEGORY RULES ACCORDING TO ISO 14025:2006
DATE 2014-02-21



PRODUCT GROUP: UN CPC 8942
PLASTIC WASTE AND SCRAP RECOVERY (RECYCLING) SERVICES

2013:08
VERSION 1.0

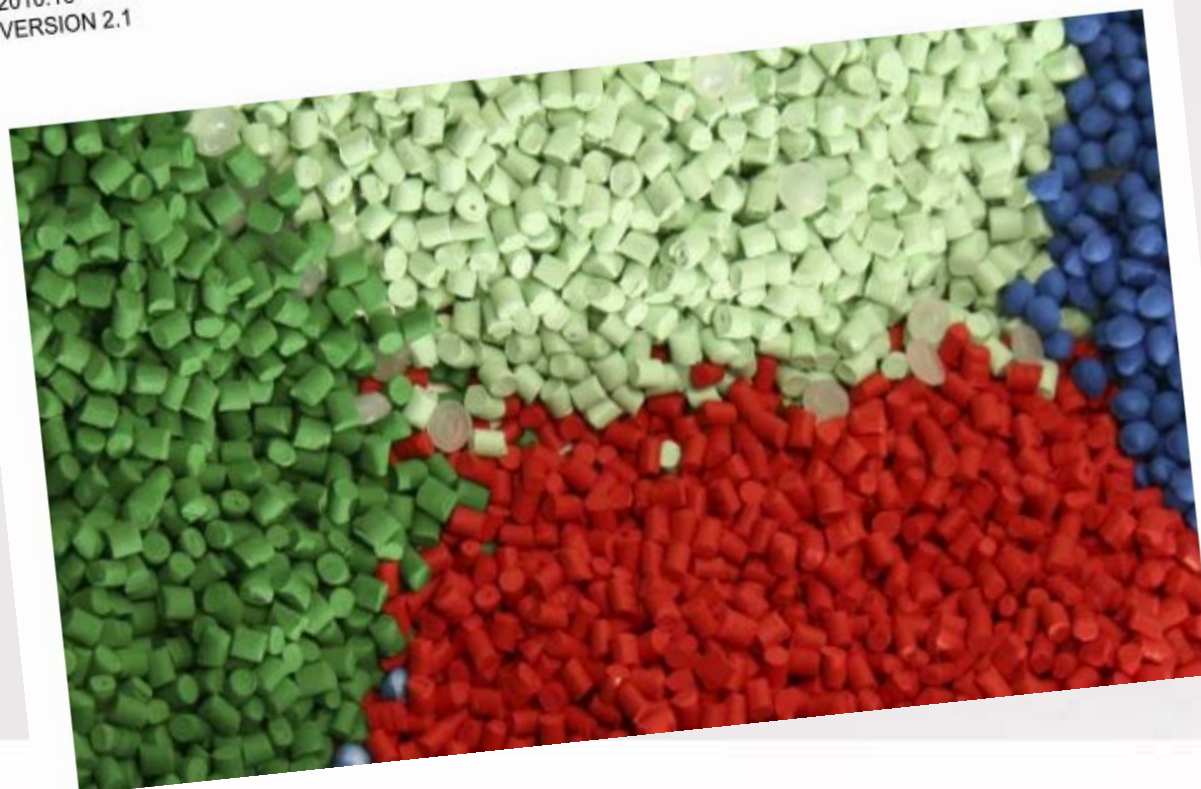


VALID I

PRODUCT CATEGORY RULES
DATE 2013-10-30

UN CPC 347
PLASTICS IN PRIMARY FORMS

2010:16
VERSION 2.1



*We cooperate to
set the standard
rules that are now
used to make
effective
comparisons...*



Key word : PCR - Product Category Rules

Mandatory Information (properties characterizing polymers)

Technical specification	Test method
Density	ISO 1183-2:2004
Melt Flow Rate	ISO 1133-1:2011 ISO 1133-2:2011
Mechanical properties: Tensile	ISO 527-1-2: 2012
Melting temperature (or glass transition temperature for amorphous polymers)	ISO 11357-1:2009 ISO 11357-2:1999 ISO 11357-5:2011
Deflection Temperature under load	ISO 75f:2004

Voluntary Information (characteristic properties of the application field)


Technical specification	Test method
Mechanical properties: Impact	ISO 179: 2010
Vicat softening temperature	ISO 306:2004
Thermal conductivity	ISO 22007-1:2009
Volume resistivity	IEC 60093 ed.2 (1980-01)
Flame behaviour	UL 94 (rev.2006)

..by choosing which typical property of product **shall** be reported on the Environmental Declaration to make fair comparison among similar products

Key word : EPD - Environmental Product Declaration


Environmental Product Declaration EPD

.....
“The overall goal of an Environmental Product Declaration, EPD®, is to provide relevant, verified and comparable information about the environmental impact of goods and services”



EPD®

RADILON® S (PA6)
RADILON® A (PA6.6)



Revision	No. 0, 30 April 2014
Registration	No. S-P-00554
Valid until	30 April 2017
CPC Code	347
PCR	2010:16 ver. 2.1



ISTITUTO DI CERTIFICAZIONE DELLA QUALITÀ

ATTESTATO DI CONVALIDA
DICHIARAZIONE AMBIENTALE DI PRODOTTO
ENVIRONMENTAL PRODUCT DECLARATION
P2148

RILASCIATO A
ISSUED TO

Radici Novacips SpA
Via Bedeschi, 20
24040 Chignolo d'Isola (BG)

Per la capacità di gestione del processo di emissione e verifica interna delle dichiarazioni ambientali relative al seguente ambito

UN CPC 34 BASIC CHEMICALS



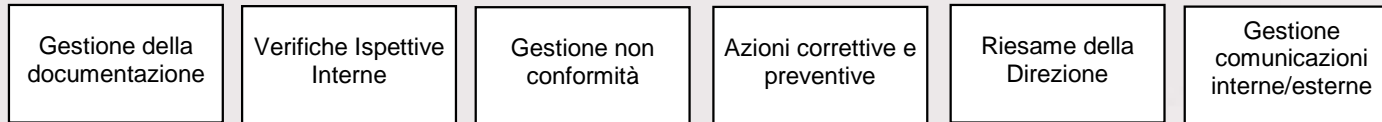
Key word: EPD - Process Certification

.....
A managerial system, third party verified, to:

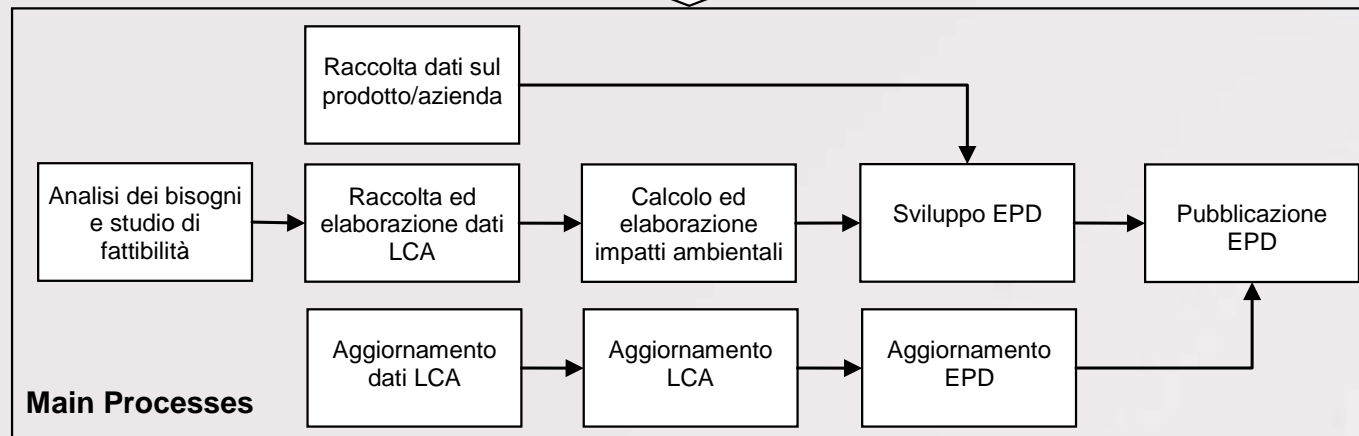
- **Drawing the process** and writing procedures to be collected in a reliable system applying General Programme Instruction,
- **Surveying the elementary flows** to be accounted in the Life Cycle Inventory (basis for LCA) ,
- **Evaluating and drafting the inputs**, in order to check the compliance to PCR
- **Create the EPD** of some of our best known products

EPD Process: the system

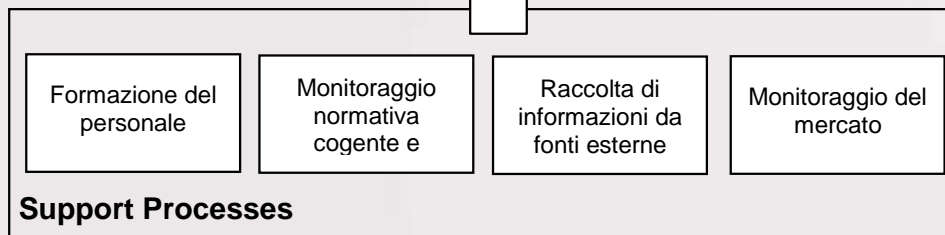
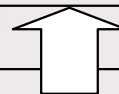
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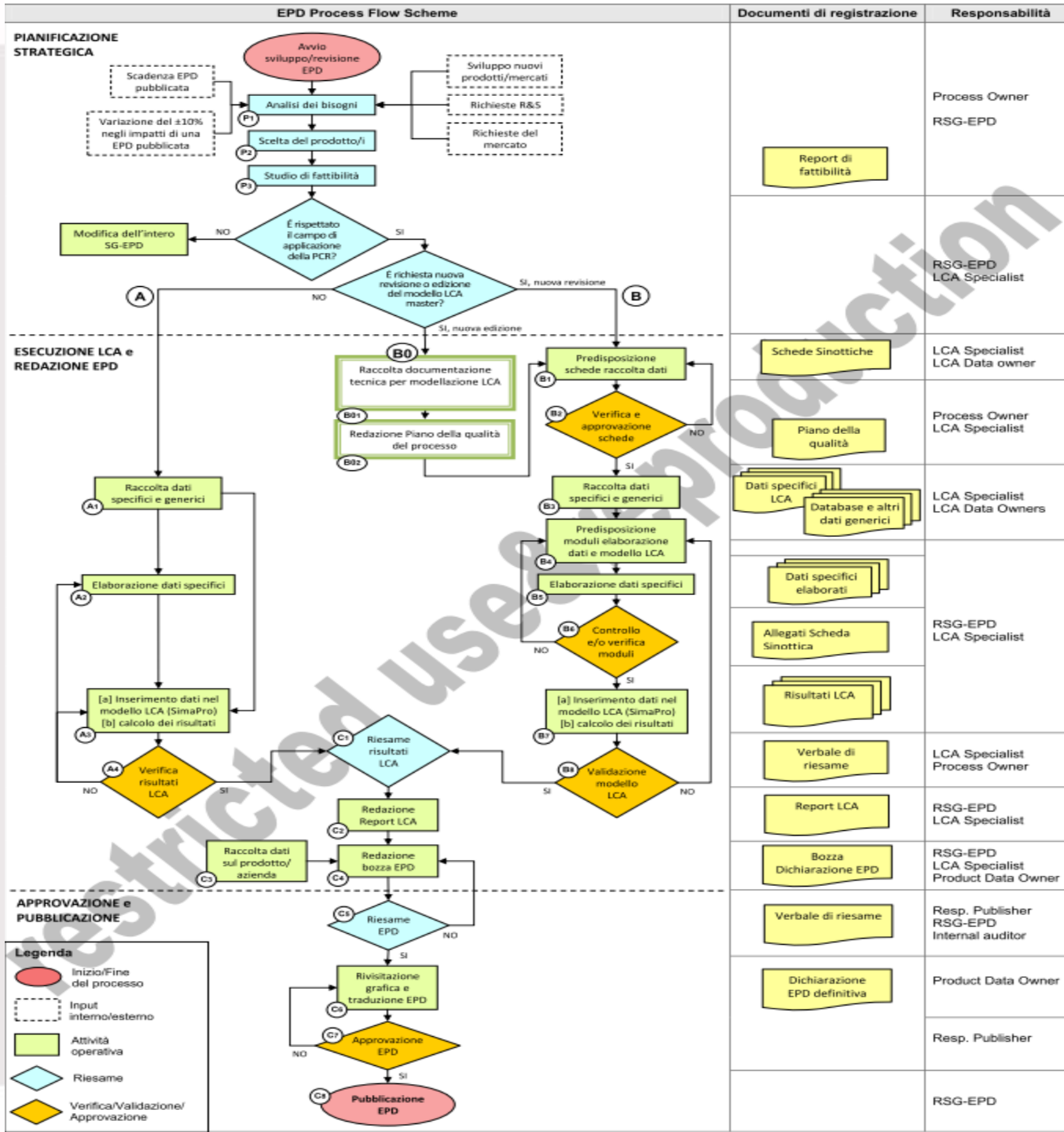


Management Processes



Main Processes





EPD Process : Manual and procedures

	Manuale del Sistema di Gestione EPD (MG-EPD)
	Titolo
MG-EPD 0	Frontespizio
MG-EPD 01	Introduzione
MG-EPD 02	Riferimenti normativi
MG-EPD 03	Termini e definizioni
MG-EPD 04	Sistema di Gestione EPD (EPD Process)
MG-EPD 05	Assicurazione dell'EPD Process

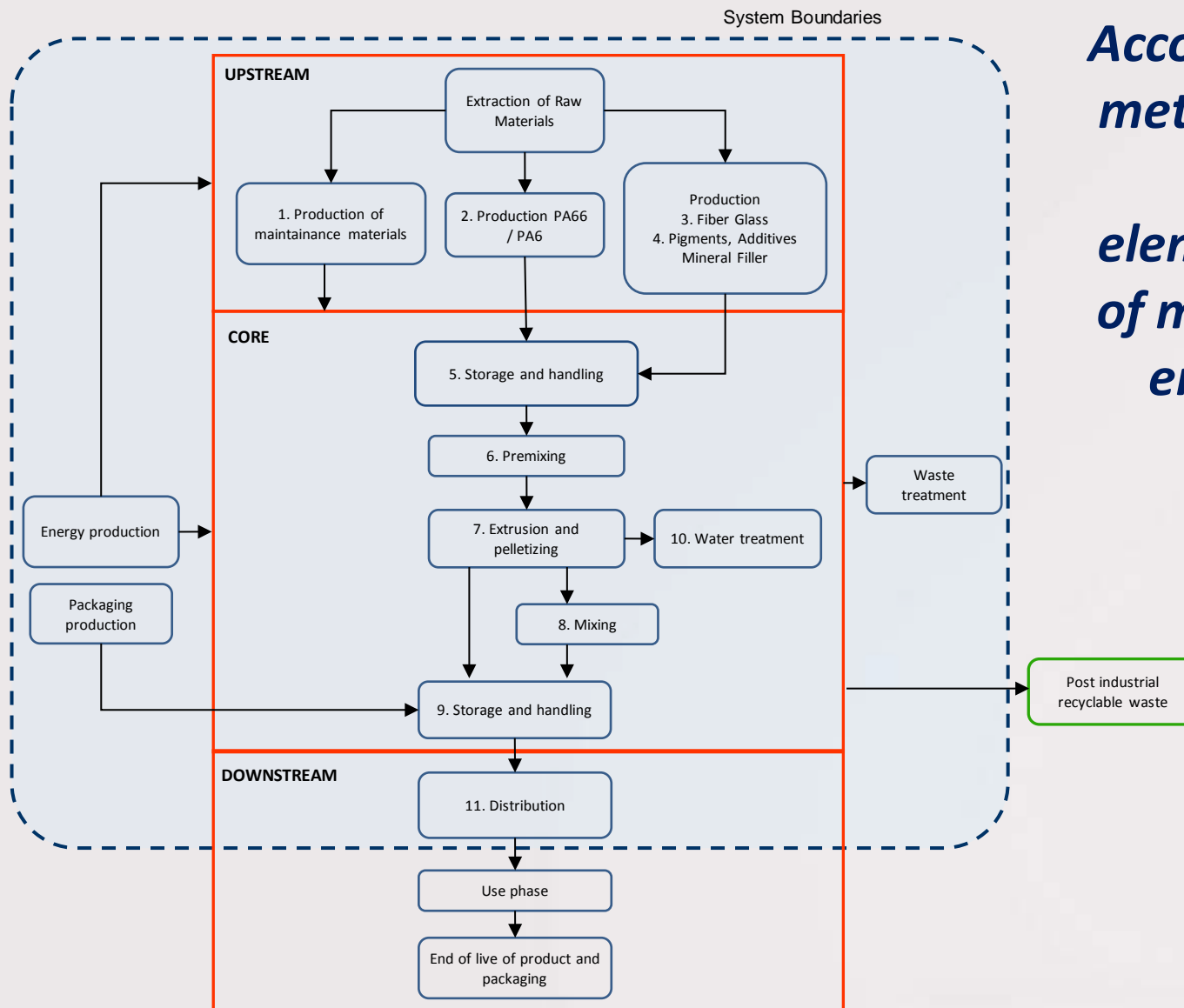
Procedure specifiche del Sistema di Gestione EF	
Titolo	
P-EPD 42.1	Controllo della documentazione e registrazioni
P-EPD 461.1	Raccolta, elaborazione e aggiornamento dei dati
P-EPD 471.1	Sviluppo e aggiornamento LCA
P-EPD 472.1	Sviluppo e aggiornamento EPD
P-EPD 48.1	Comunicazioni interne ed esterne
P-EPD 5.1.1	Verifiche Ispettive Interne
P-EPD 5.2.1	Riesame della Direzione
P-EPD 5.3.1	Gestione delle non conformità e Azioni correttive e preventive
P-EPD E 32.1	Comunicazione e Uso del Logo

EPD Process : Forms

D-EPD 01	EPD Process Flow Scheme
D-EPD 02	Elenco della documentazione interna ed esterna
D-EPD 03	Report di fattibilità
D-EPD 04	Assegnazione responsabilità raccolta dati specifici
D-EPD 05	Verbale di riunione del riesame della direzione
D-EPD 06	Format EPD
D-EPD 07	Registro delle EPD e dei documenti correlati
D-EPD 08	Comunicazioni interne ed esterne
D-EPD 09	Registro Non Conformità, AC, AP
D-EPD 10	Report di controllo variazioni dati LCA
D-EPD 11	Verbale di riesame LCA-EPD
D-EPD 12	Rapporto di audit interno
D-EPD 13	Figure Chiave del Sistema di gestione EPD
D-EPD 14	Matrice delle competenze
D-EPD 15	Modello Master- Format LCA (SimaPro)
D-EPD 16	Schede Sinottiche (facsimile-esempio)
allegati	
Titolo	
ALL.01	Politica Ambientale di Prodotto
all.02	Organigramma
all.03	Liste di riscontro V.I.I



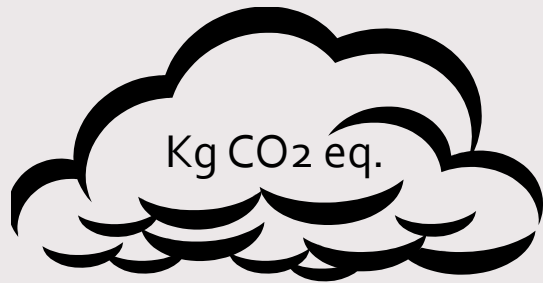
EPD Process: the boundaries



According to LCA methodology and PCR, each elementary flow of materials and energy used is accounted...

Key word : EPD- Environmental Product Declaration

.....
... and summed up in a certified final report



Global Warming Potential

- ***Acidification*** g SO₂ eq
- ***Eutrophication*** g PO₄³⁻
- ***Photochemical oxidant creation*** g C₂H₄ eq



Gross energy requirement

Key word : EPD- Environmental Product Declaration

PROFILO AMBIENTALE

RADILON® A RV 300

Categorie di impatto ambientale

CATEGORIA DI IMPATTO	UNITÀ DI MISURA	UPSTREAM PROCESSES	CORE PROCESSES	DOWNSTREAM PROCESSES	TOTALE
Riscaldamento globale	kg CO ₂ eq.	6,5069	0,1147	0,2030	6,8247
Riduzione dell'ozono	kg CFC-11 eq.	3,12E-08	7,15E-09	1,26E-08	5,10E-08
Formazione di ossidanti fotochimici	kg C ₂ H ₄ eq.	0,0050	0,0002	0,0003	0,0054
Acidificazione	kg SO ₂ eq.	0,0240	0,0009	0,0008	0,0256
Eutrofizzazione	kg PO ₄ ³⁻ eq.	0,0062	0,0002	0,0002	0,0066

GER - Gross Energy Requirements

GER	UNITÀ DI MISURA	UPSTREAM PROCESSES	CORE PROCESSES	DOWNSTREAM PROCESSES	TOTALE
Risorse non rinnovabili	MJ	104,133	1,766	3,261	109,159
Risorse rinnovabili	MJ	1,296	1,820	0,000	3,116



EPD Process : our goal

Contribute to Eco-Design of **products**

- Radici Group Plastics R&D now considers the **technical performance** linked with the **environmental performance** of our formulations already at **the early stage** of development
- We can choose the **formulation with lower impact**, and directly release its certified EPD
- We can **support our partners** in the selection of the best solution with respect to:
 - **Environmental impact;**
 - **Recyclability**
 - **Technical Performance**