

The VinyLoop® Case

How to shape LCA tools
to promote the use of recycled PVC

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1. Introduction VinyLoop®



The VinyLoop® Eco-Advantage

VinyLoop® a high Quality R-PVC

- Mechanical Recycling of complex PVC wastes
 - mainly cable wastes
 - composite structures need to contain at least 70% of PVC
- Separation of the PVC compound from other materials and contamination
 - by selective dissolution and filtration
- A new step of a centrifuge decanter was recently added to the process to ensure a higher purity of VinyLoop®
- Regenerated PVC compound
 - Higher and consistent level of quality compared to traditional R-PVC
 - which can be processed by extrusion, injection or calendaring





2. The environmental advantage of VinyLoop®



Eco-Advantage

- Vinyloop® contributes to a sustainable development
 - It is part of a lifecycle supporting the idea of cradle to cradle
- Support of the EU ‘Lead Markets Initiative for Europe’
 - The Lead Market Initiative is the European policy for 6 important sectors that are supported by actions to lower barriers. One of these is the development of new recycling technologies.
- VinyLoop® is part of the VinylPlus Voluntary Commitment
 - which aims to achieve an ambitious increase of recycling
 - Level of 800kt/a of recycled PVC to be reached by 2020



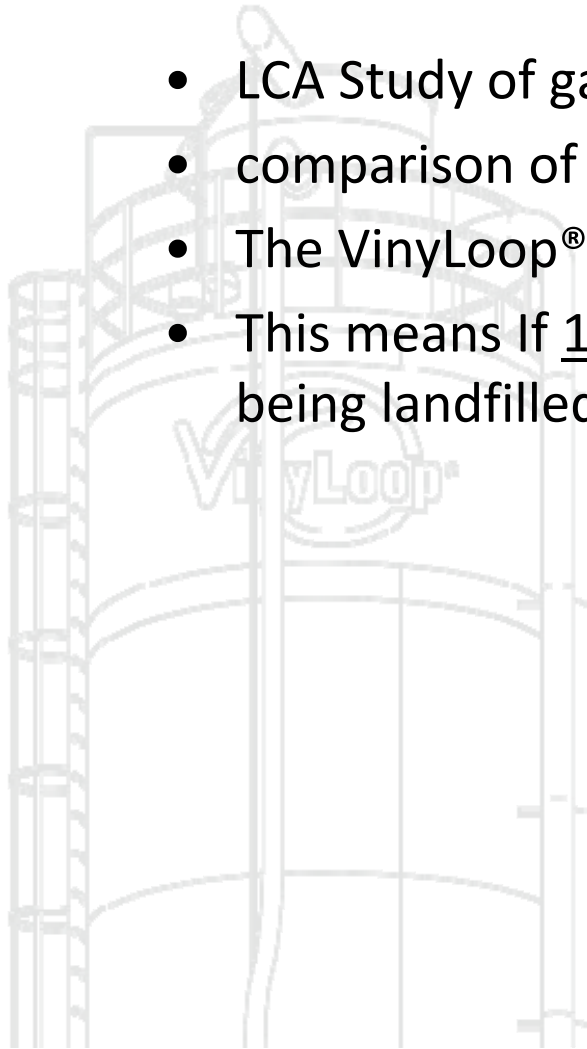
The Environmental Advantage of VinyLoop®

- VinyLoop® is based on the concept to extend the lifecycle of a product:
 - Saves valuable resources.
 - Prevents valuable plastics being disposed to landfill or incineration.
 - Supports Cradle to Cradle
 - the “end” of one product life cycle is automatically the “birth” of a new product, no waste is generated.
- Lower environmental footprint than virgin PVC compound
 - Proofed by an Eco-Footprint Study
 - Being reviewed by Dekra

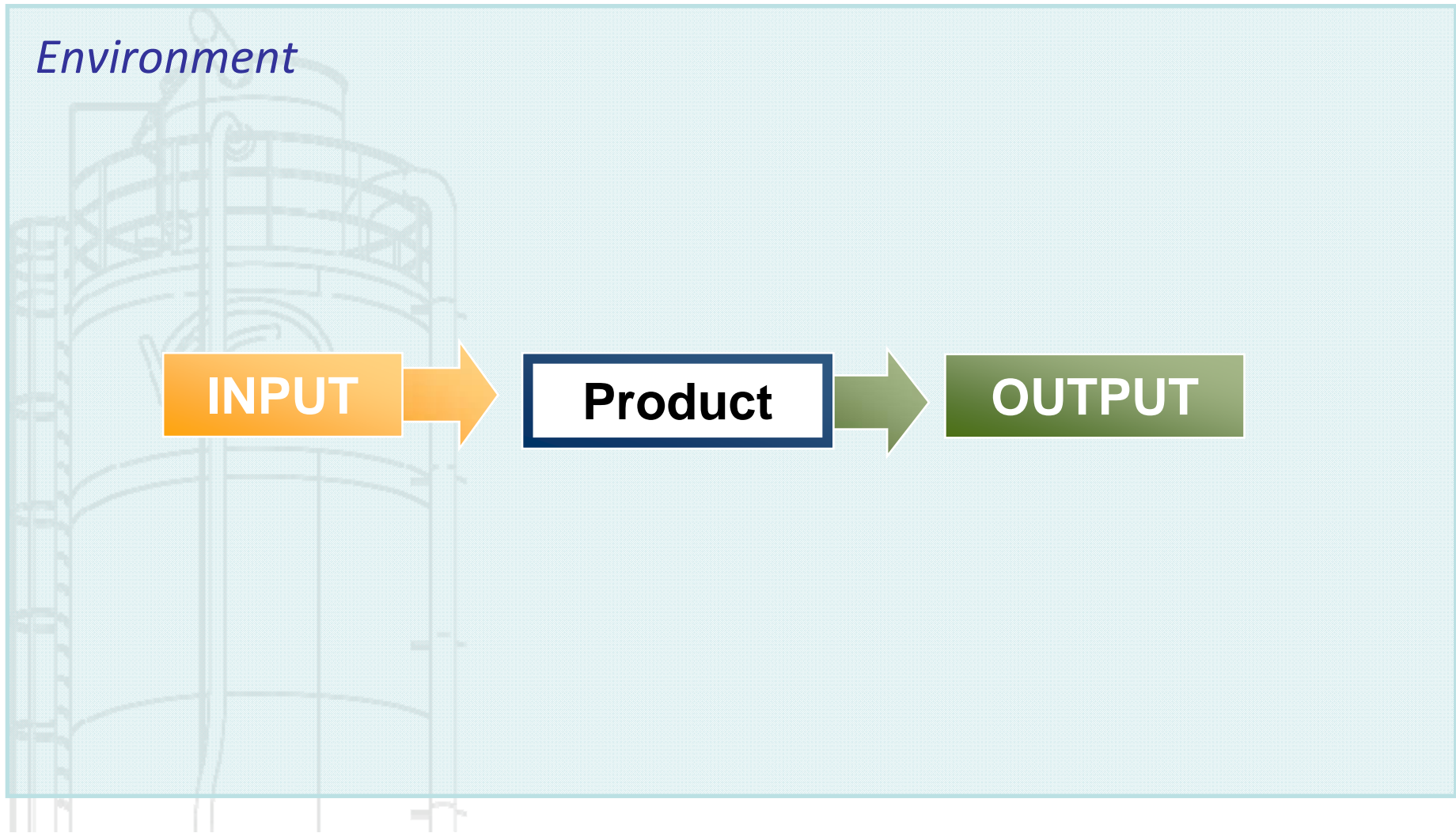


The VinyLoop Eco-Footprint Study

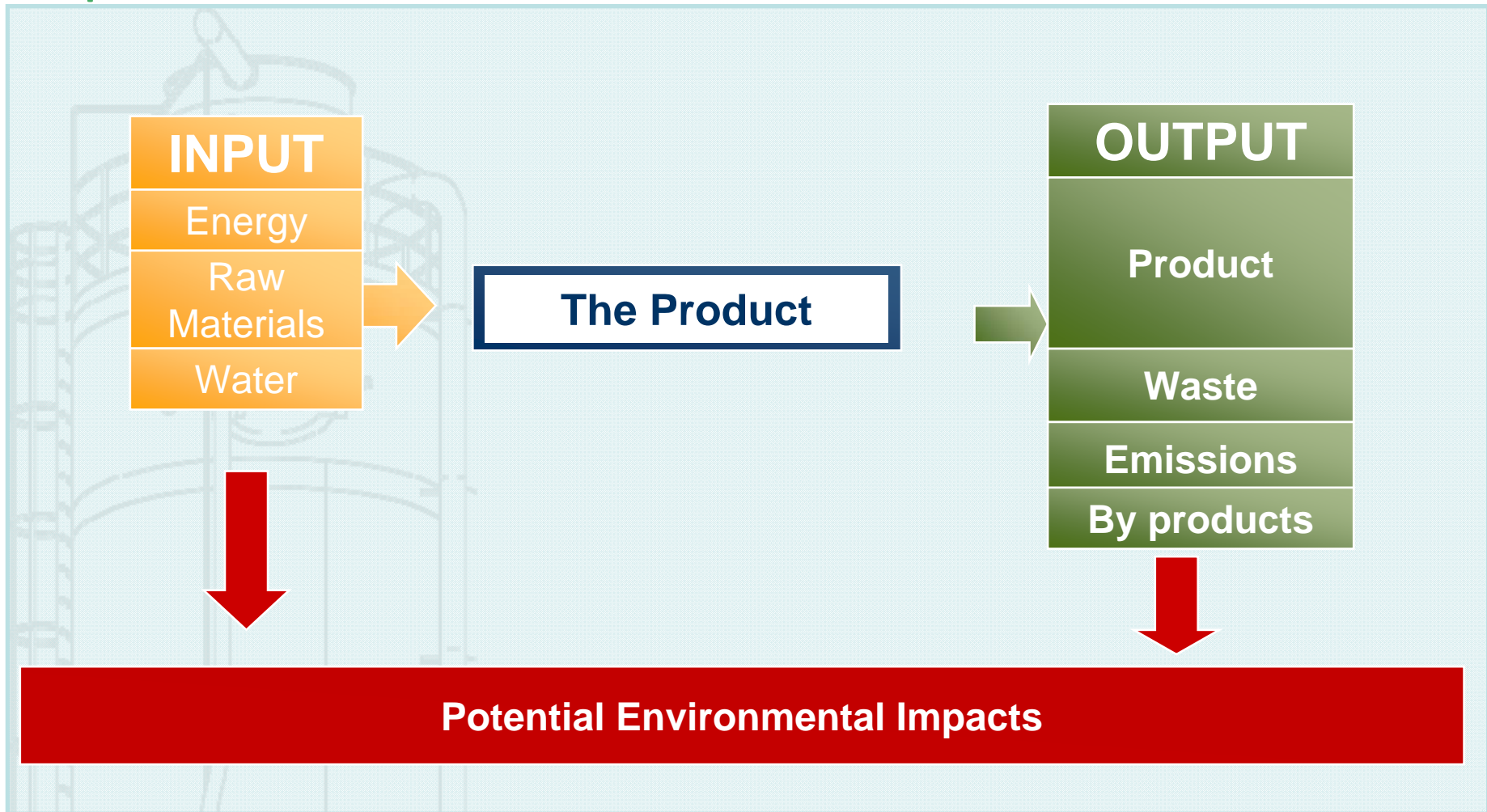
- LCA Study of gate to gate process
- comparison of VinyLoop® with virgin PVC
- The VinyLoop® is 100% post consumer grade
- This means If 1 ton of PVC is recycled; 1 ton of PVC is not being landfilled or incinerated



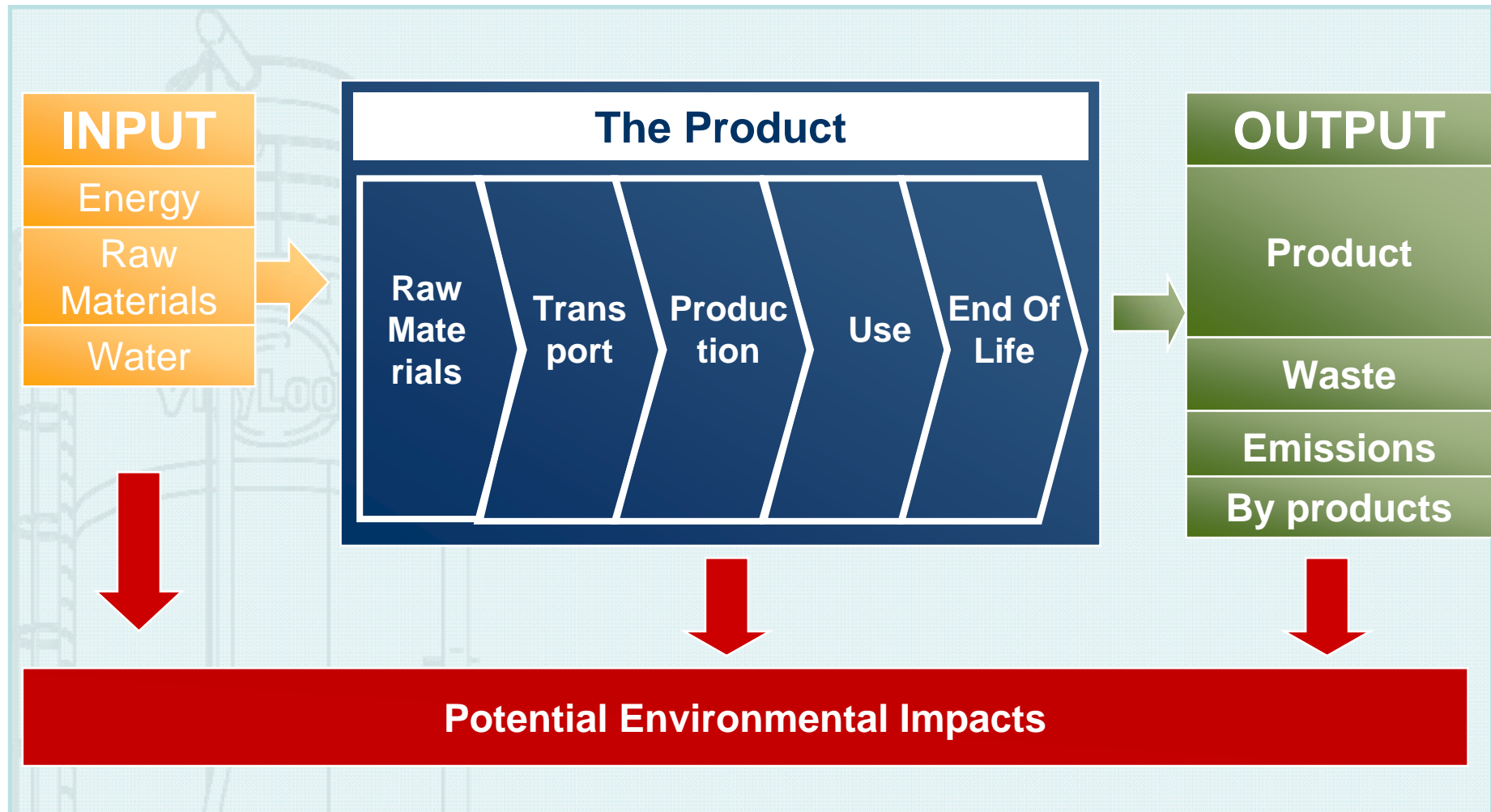
What is Life Cycle Assessment?



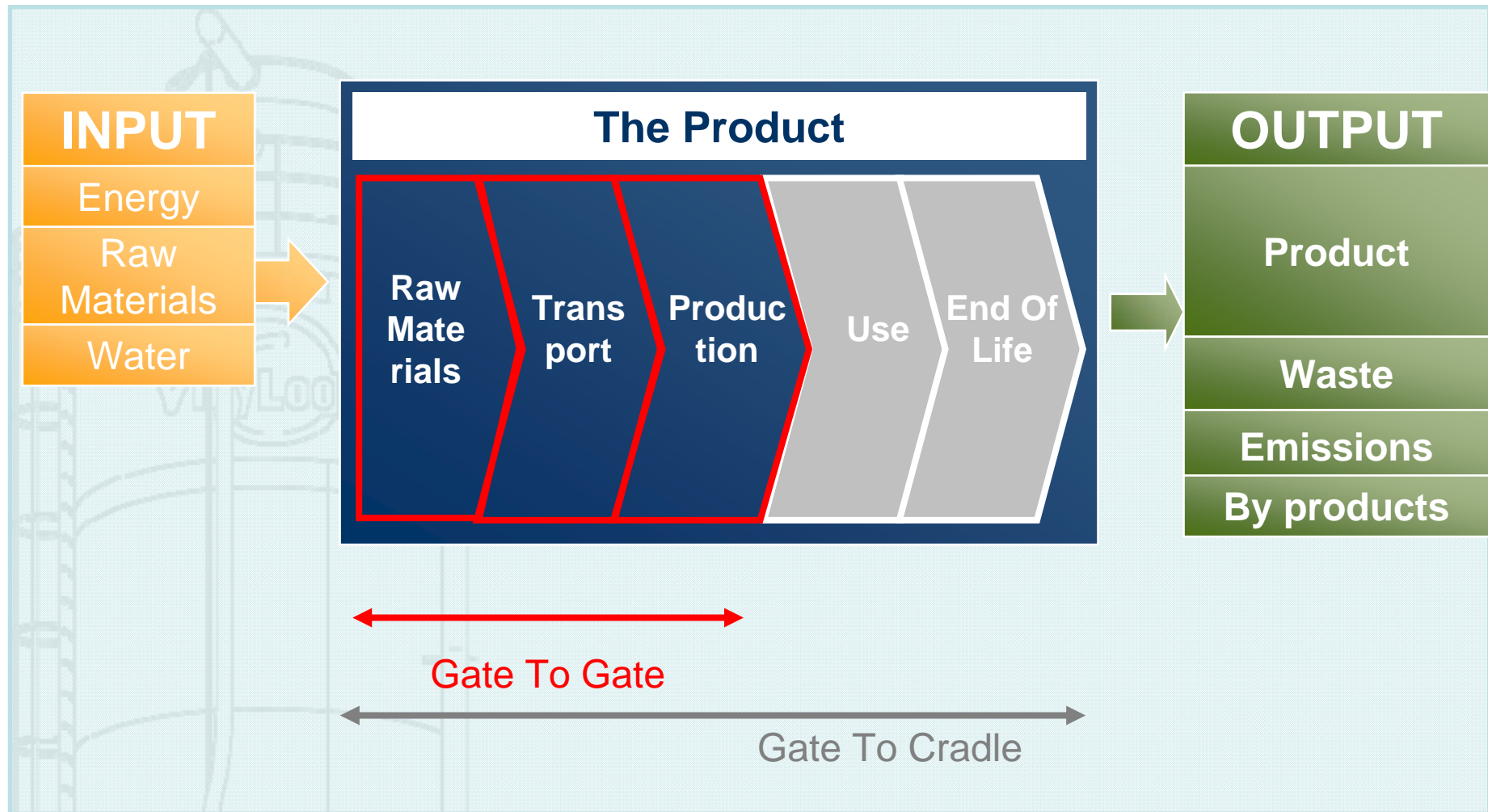
Life Cycle Assessment - assess environmental impacts



Life Cycle Assessment - assess environmental impacts associated with all stages of a products life



Gate To Gate Analysis





3. The Challenges of LCA: how to Communicate in a B2B & B2C environment?

Life Cycle Assessment offers a holistic set of impact categories:

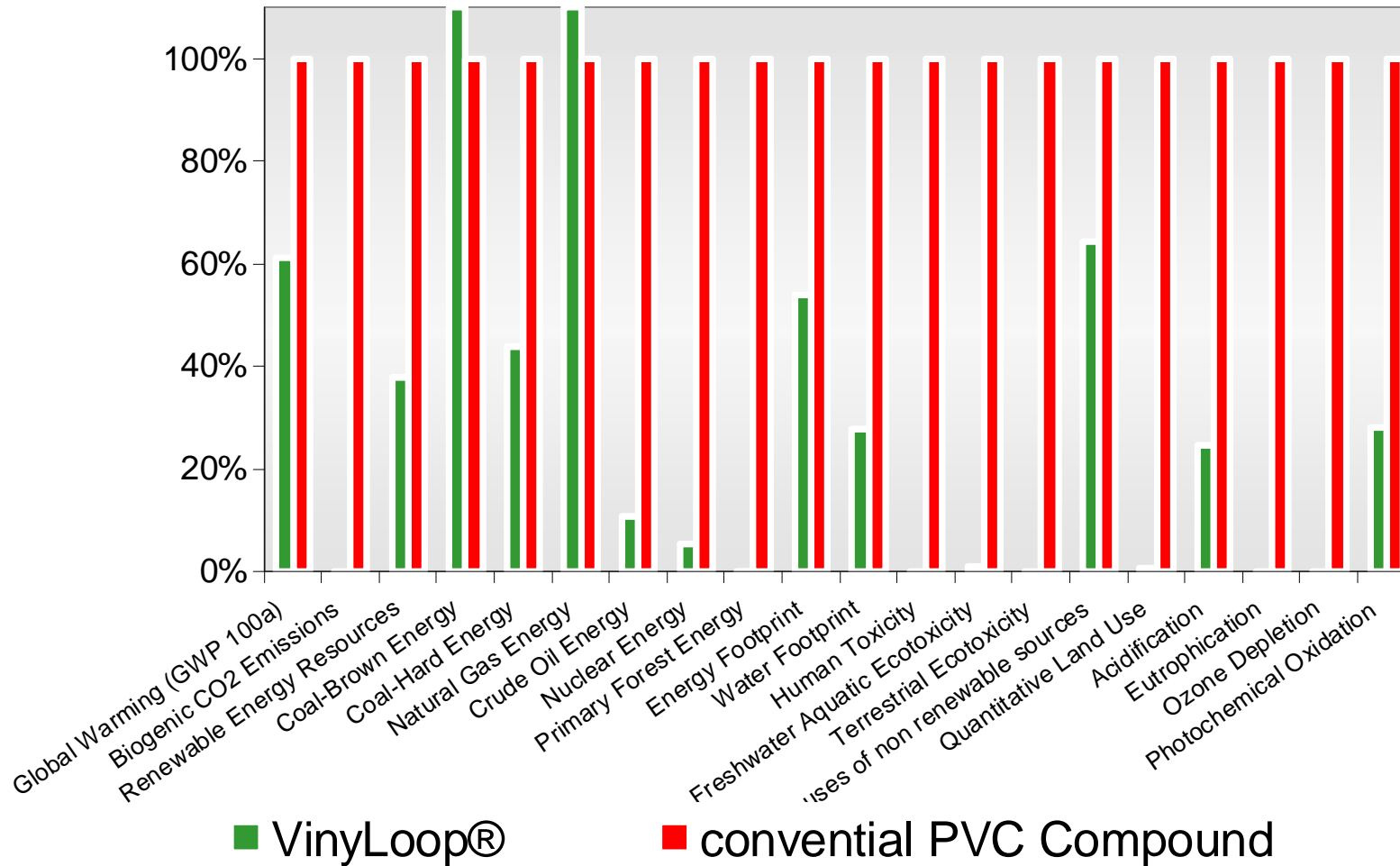
- GWP 100a
- Biogenic CO2 Emissions
- Renewable Energy Resources
- Coal-Brown Energy
- Coal-Hard Energy
- Natural Gas Energy
- Crude Oil Energy
- Nuclear Energy
- Primary Forest Energy
- Ozone Depletion
- Photochemical Oxidation
- All Energy Resources
- Water Consumption
- Human Toxicity
- Freshwater Aquatic Ecotoxicity
- Terrestrial Ecotoxicity
- Environmental Toxicity
- Depletion of abiotic resources
- Quantitative Land Use
- Acidification
- Eutrophication
- ... and much more

Variety of Evaluation tools and methodologies

- Some impact assessment methods:

- ReCiPe
- Eco-indicator 99
- CML 2 (2000)
- EDIP/UMIP
- EPS 2000
- Ecopoints 97
- Impact 2002+
- ... and much more

Environmental Footprint Comparison of VinyLoop vs. Conventional PVC compound



The Challenge

- Convert Data from scientific expert level into a marketing instrument!
- How to transform data into a message which can be understood by end-consumers?
- Which impact categories are important for which application and industry?



Transform LCA into a Business Proposal



Create added Value to our customer



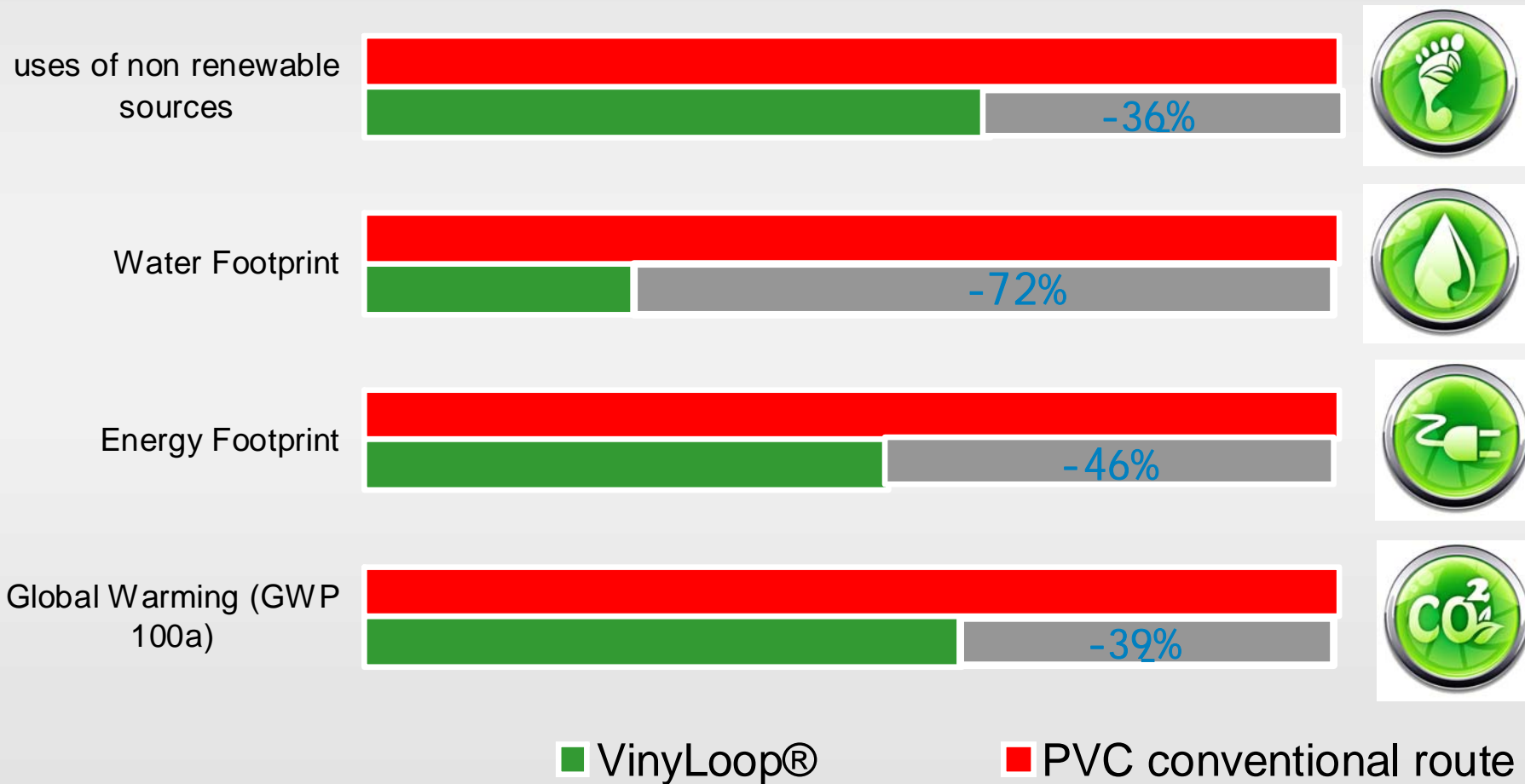
4. The Solution: adaptation and Eco- Consultancy

Business Case: B2B



- The solution for Business to Business: tailor made Eco-Footprint Analysis by application and industry.
- According to industry needs develop a tool based on different impact categories:
- Three examples for three sectors:
 - General B2B communication
 - Gardening
 - Automotive

Environmental Footprint for B2B Comparison of VinyLoop vs. Virgin PVC

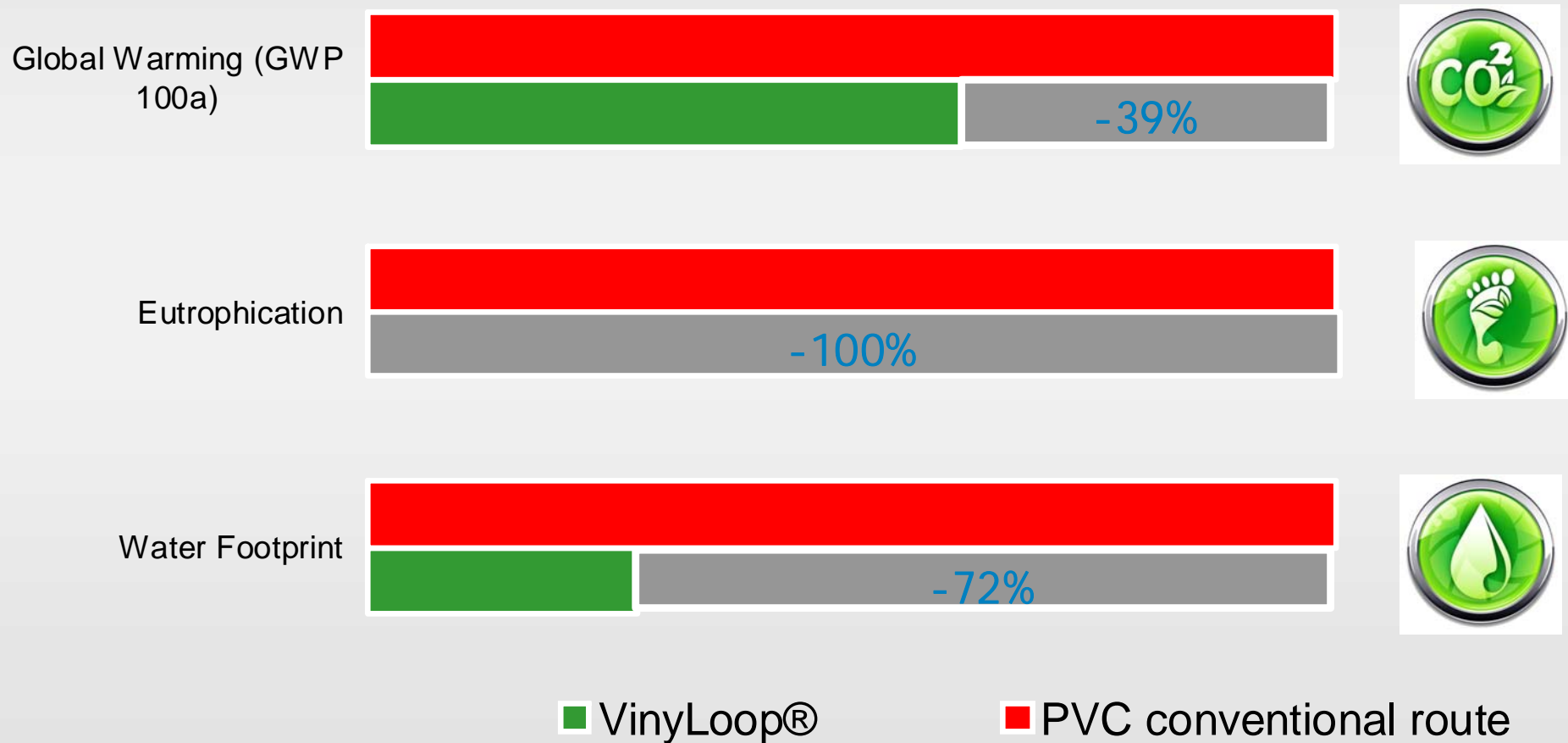


Business Case: Gardening



- Different impact categories:
- Water footprint
 - **Blue water footprint:** volume of water used that doesn't return to the water source from which it came
 - **Grey water footprint:** volume of polluted water = volume of water needed to dilute the pollutants released into the water system
- Eutrophication
 - Through the addition of e.g. fertilizers or sewage, plant biomass is increasing in an aquatic system. It is the "bloom" of plankton in a water, which effects the depletion of oxygen in the water.
- Global Warming Potential
 - relative measure of how much heat a greenhouse gas is released in the atmosphere, calculated over a specific time interval e.g. 100years

Environmental Footprint of Garden Hoses Raw Material Comparison of VinyLoop vs. Virgin PVC

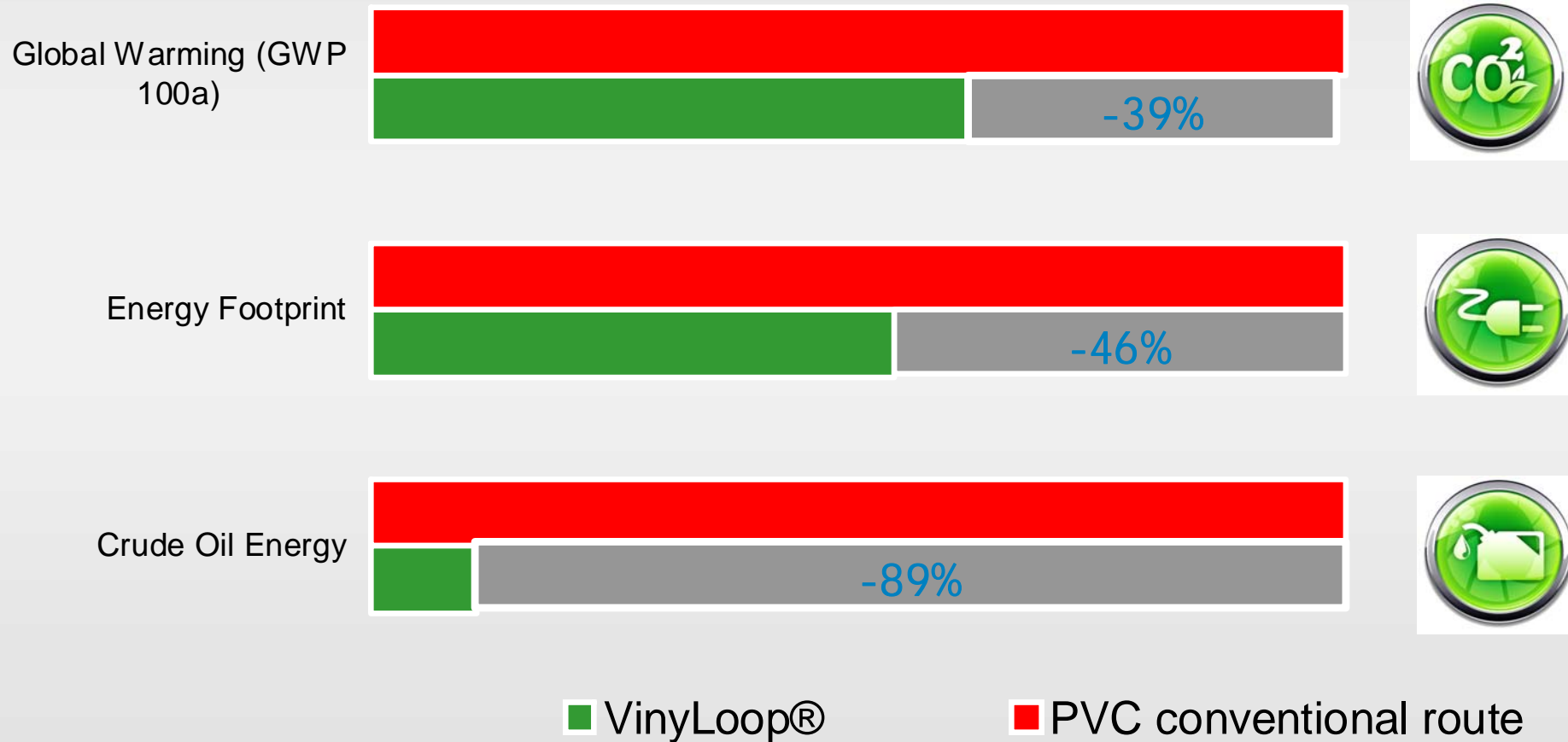


Business Case: Automotive



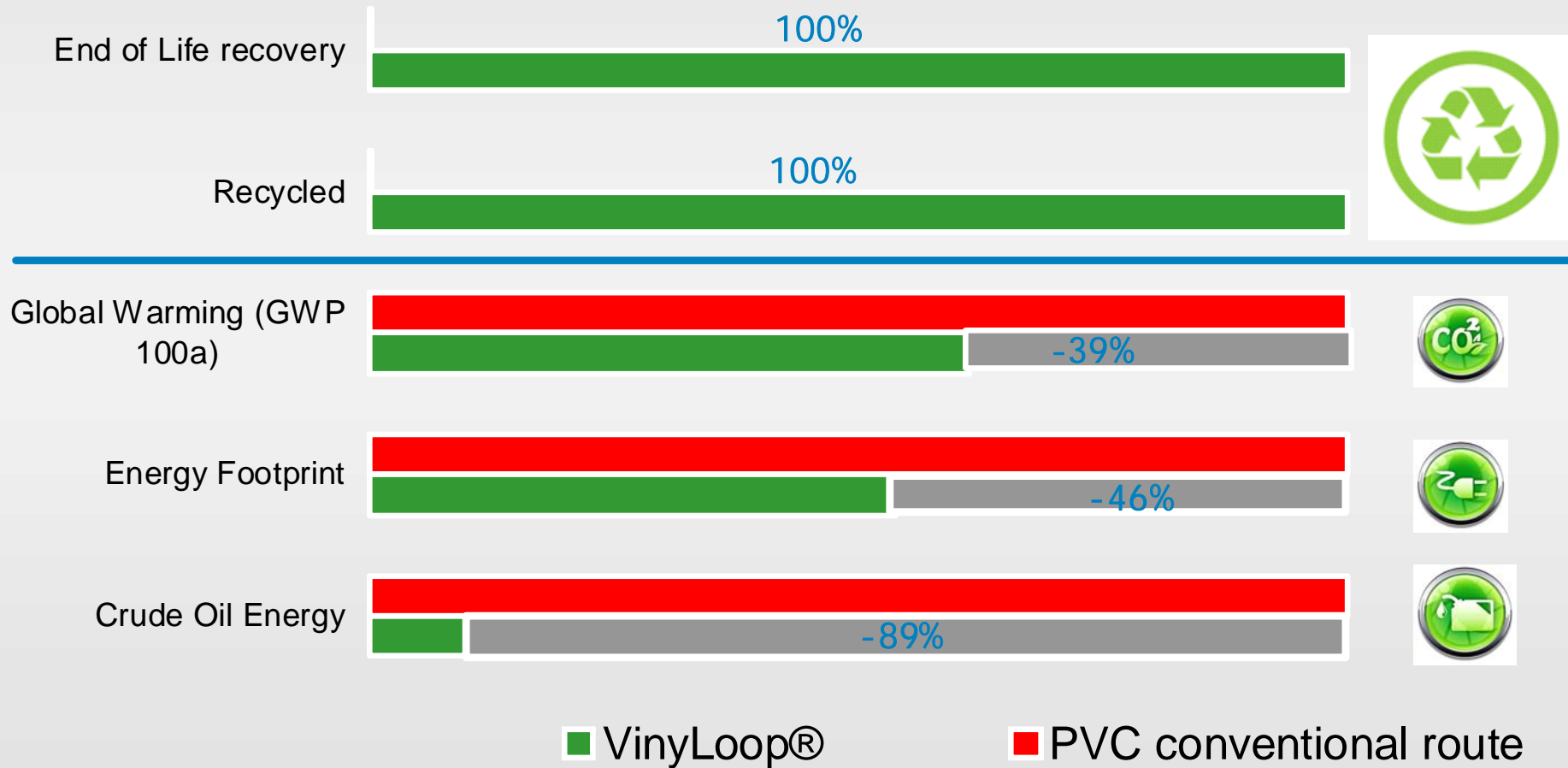
- 2015 EU End of Life Vehicle Directive
 - 95% of materials should be recycled
- E.g. Renault eco² car line
 - Min 5% Recycled content
 - Min 95% Recyclable
- E.g. Toyota Green Program
 - Zero Waste to Landfill
- Impact Categories
- Global Warming
- Energy footprint
- Crude Oil Energy Footprint

Environmental Footprint of Automotive Raw Material Comparison of VinyLoop vs. Virgin PVC



The VinyLoop® Eco-Advantage

Environmental Footprint of Automotive Raw Material Comparison of VinyLoop vs. Virgin PVC



The VinyLoop® Eco-Advantage



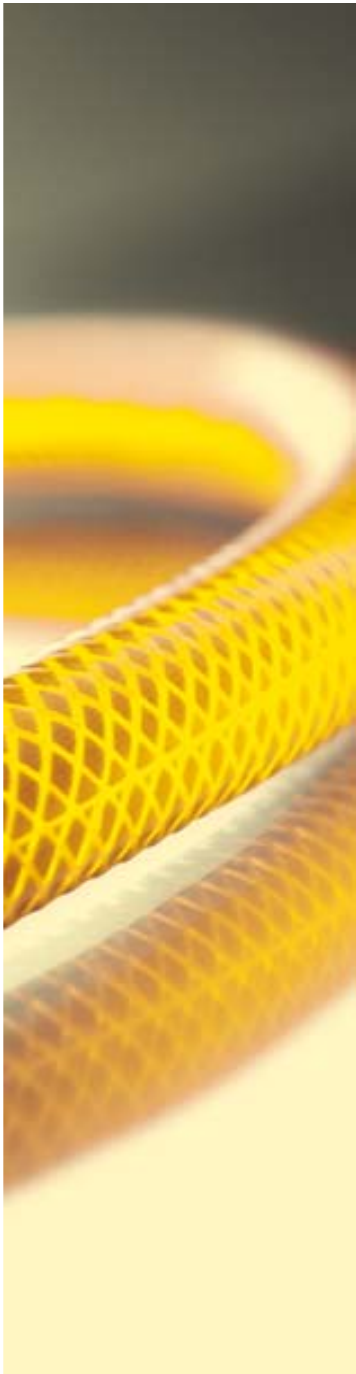
5. Outlook



Outlook

- Consumer awareness for Sustainable and Green Solutions will rise further
- The Megatrend 'Sustainability' will create demand up in the value chain
- Plastic Manufacturers and Recyclers who can answer this demand will profit
- Be Proactive, Think Sustainable and Innovative
- use Recycled Plastics!





www.vinyloop.com

