Green and Circular Economy for the Future of Manufacturing and International Trade in the Food and Lifestyle Industry Sectors

Green Economy

Circular Economy

23 March 2022

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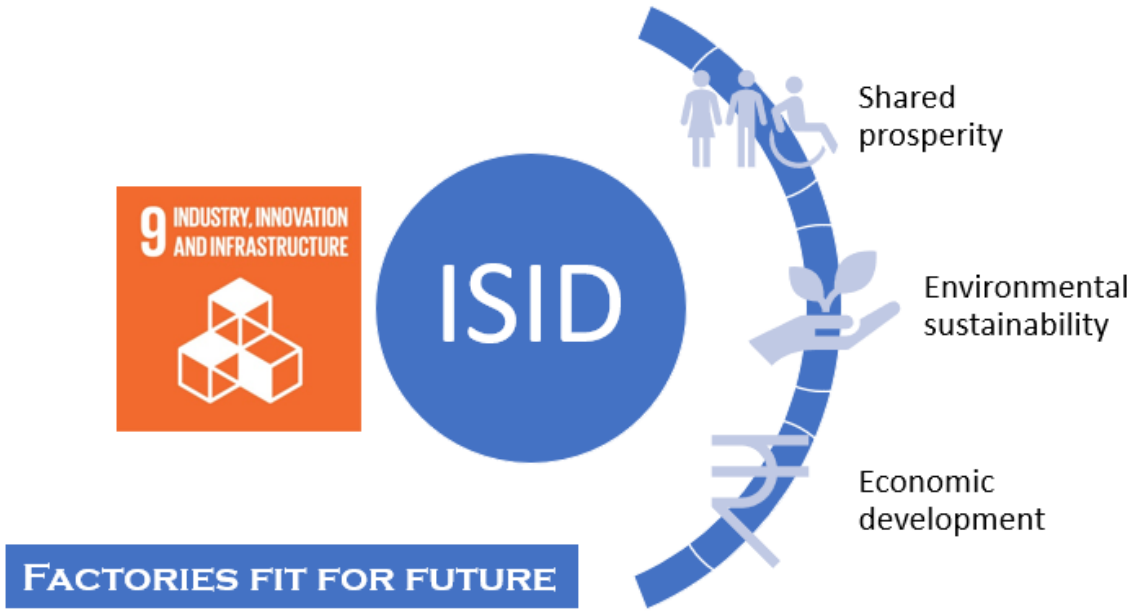
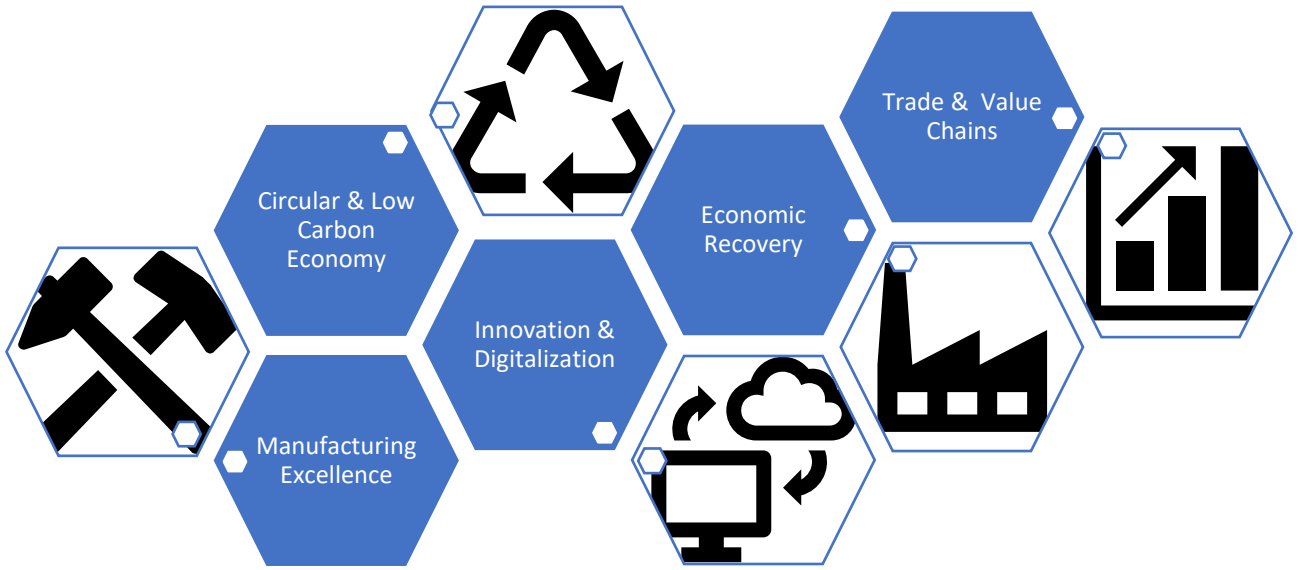
United Nations Industrial Development Organisation

Inclusive and Sustainable Industrial Development (ISID)

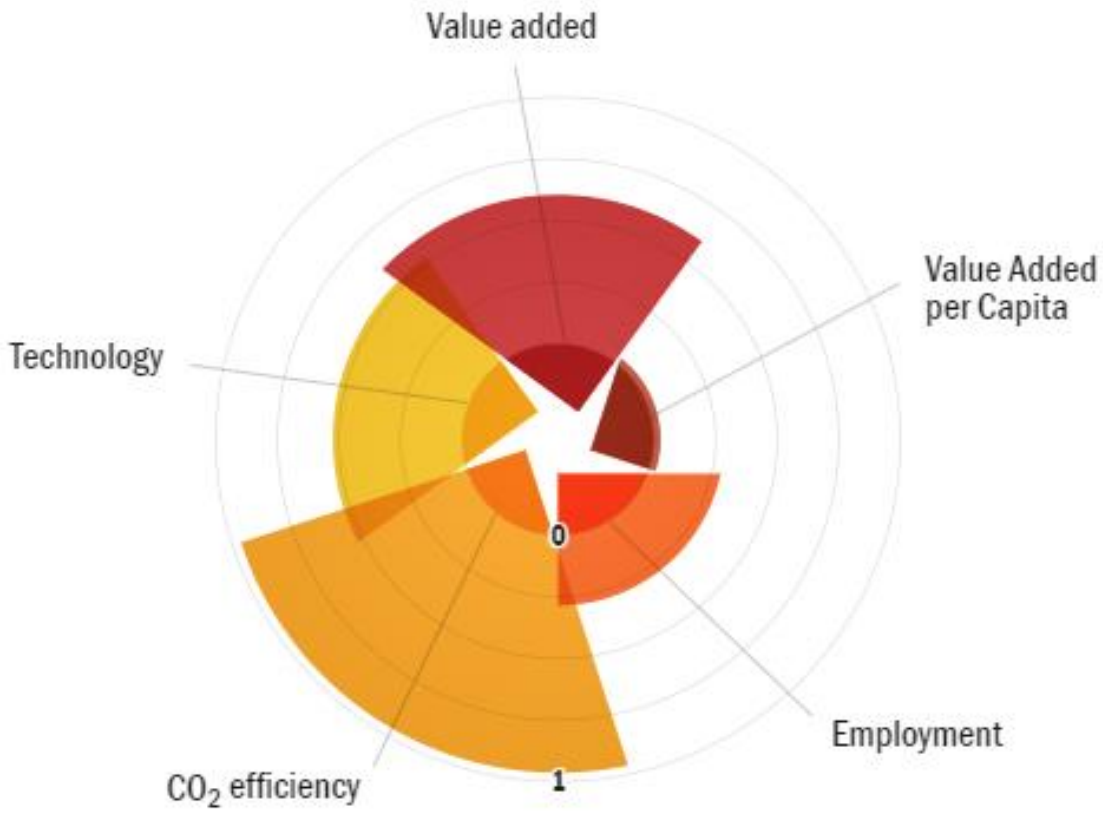




SDG-9 Industry Index

↑ 51st

Tracker >



China (15th)
Malaysia (18th)
Thailand (23rd)
Indonesia (45th)
Philippines (51st)
Vietnam (61st)
India (75th)
Sri Lanka (77th)
Bangladesh (87th)
Pakistan (91st)

(out of 131 tracked)

IAP. UNIDO.ORG
INDUSTRIAL ANALYTICS PLATFORM

https://iap.unido.org/data/sdg-9-industry?p=PHL

Triple planetary crisis

- Climate change, biodiversity loss and pollution add up to three ***self-inflicted planetary crises*** that are closely interconnected and put the well-being of current and future generations at unacceptable risk.
- ***Piecemeal and uncoordinated action*** on climate change, biodiversity loss and pollution is falling far short of what is needed to prevent environmental decline. That failure is threatening humanity's future and putting the Sustainable Development Goals out of reach.

UNEP, 2021

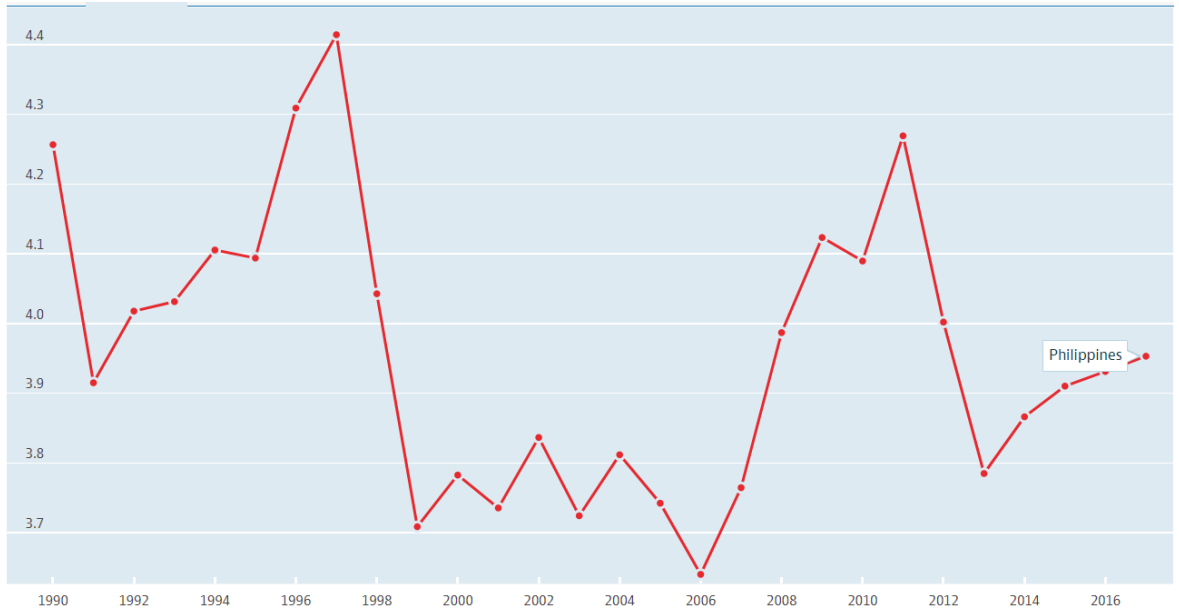
Policy and market responses

Transformative change of production and consumption systems

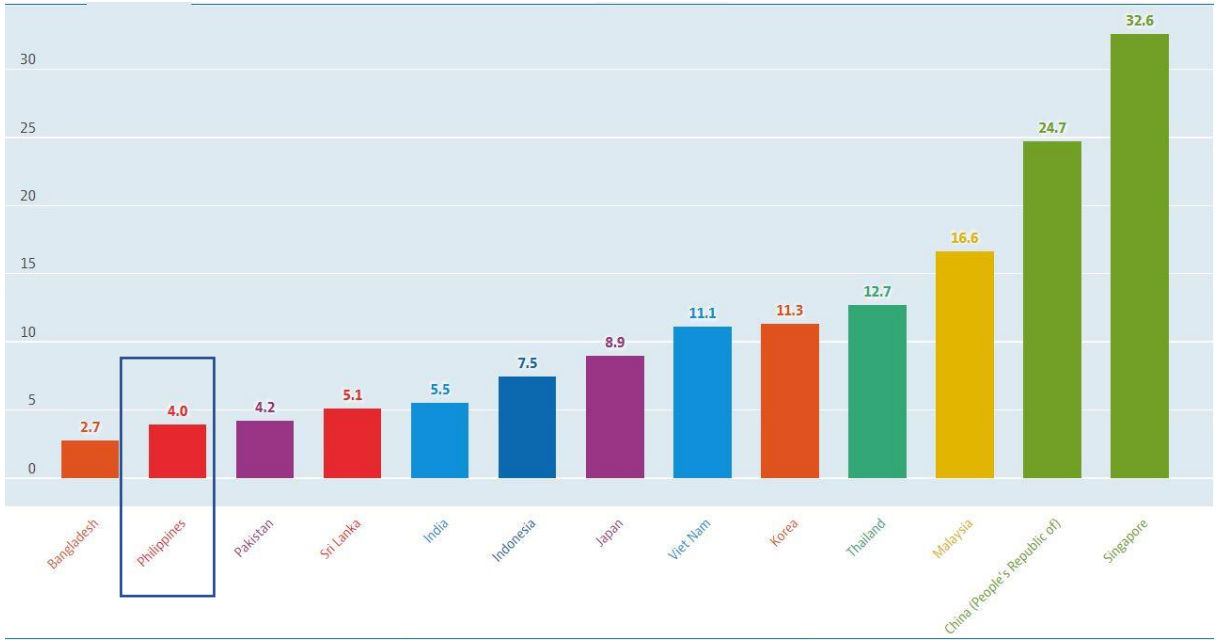
UNEP, 2021

- The interconnected nature of climate change, loss of biodiversity, land degradation, and air and water pollution means they must be addressed together to maximize the benefits and minimize trade-offs.
- Extraction, and processing of natural resource materials - including metals, minerals, fossil fuels and biomass - causes around 90% of land-related biodiversity loss and water stress, 50% of global climate change, as well as one-third of global air pollution [IRP]
- Ambitious and coordinated action by governments, businesses and people around the world required to achieve resource efficiency and circular economy.

Materials consumption
(ton/capita.year)



10% reduction in per capita materials consumption in Philippines since 1990

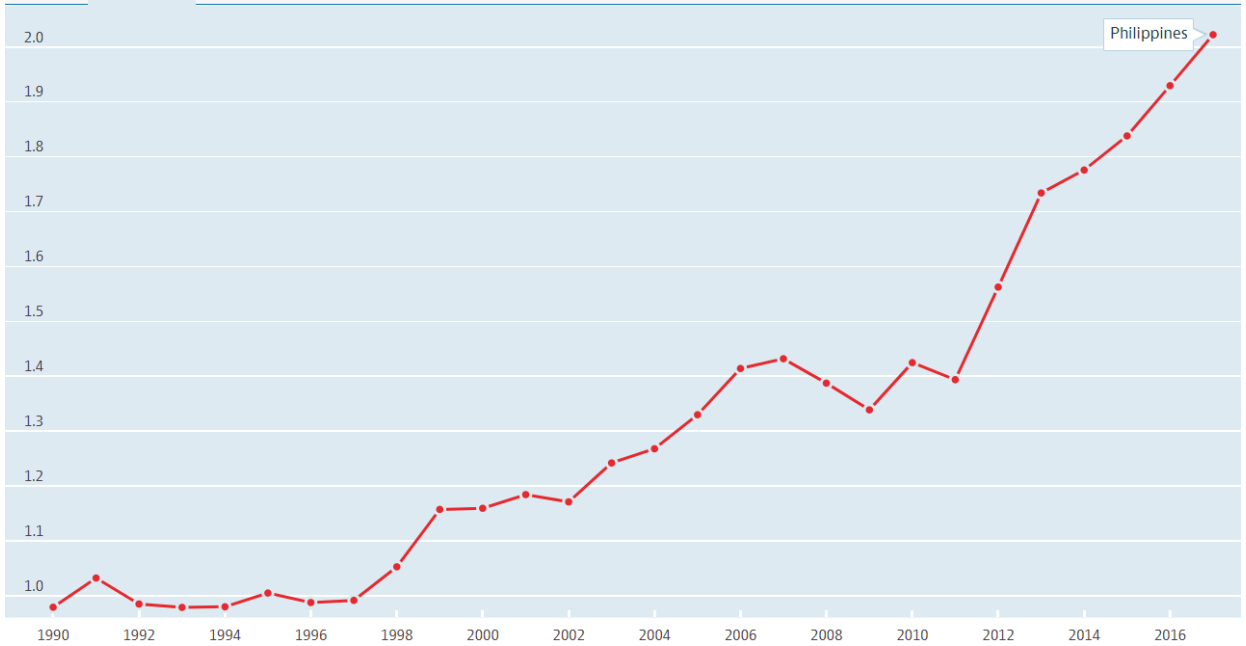


Per capita materials consumption in Philippines remains relatively low compared to Asian middle and high income manufacturing economies

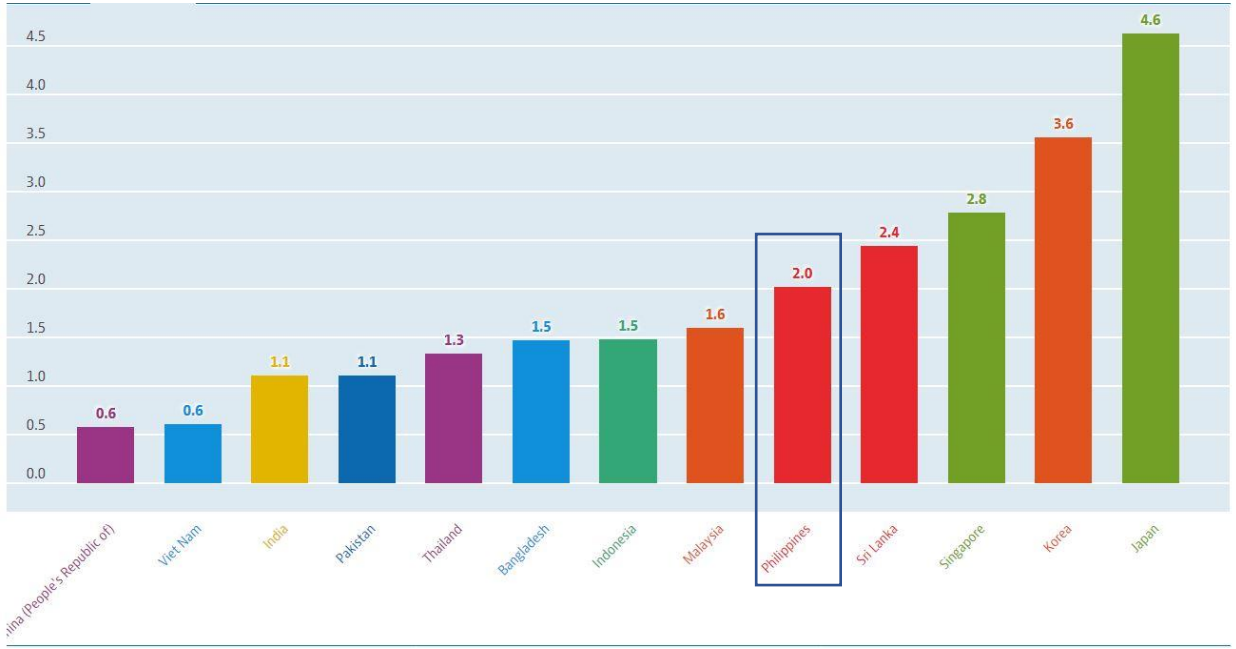
OECD 60 YEARS Data

https://data.oecd.org/materials/material-consumption.htm#indicator-chart

Material productivity
(2010 USD/ton)



Material productivity more than doubled in Philippines since 1990



Material productivity in Philippines is among highest of Asian middle income countries

OECD | 60 YEARS | Data

https://data.oecd.org/materials/material-productivity.htm#indicator-chart

An economy that aims at reducing environmental risks and ecological scarcities, and that aims for sustainable development without degrading the environment

Green Economy

Circular Economy

Model of production and consumption which involves sharing, leasing, reusing, repairing, refurbishing and recycling existing materials and products as long as possible.

WIKIPEDIA
The Free Encyclopedia

Circular economy

Environment

- Looking beyond the current "take, make and dispose" extractive industrial model, the circular economy is *restorative* and *regenerative* by design.
- Relying on system-wide innovation, it aims to redefine products and services to design waste out, while minimising negative impacts.
- Underpinned by a transition to renewable energy sources, the circular model builds economic, natural and social capital

Business

- Circular Economy is a new way of looking at the relationships between markets, customers and natural resources.
- It leverages new business models and disruptive technologies to transform the linear economic model

ELLEN MACARTHUR FOUNDATION

wbcsd

Circular ~~= Recycling~~

3R

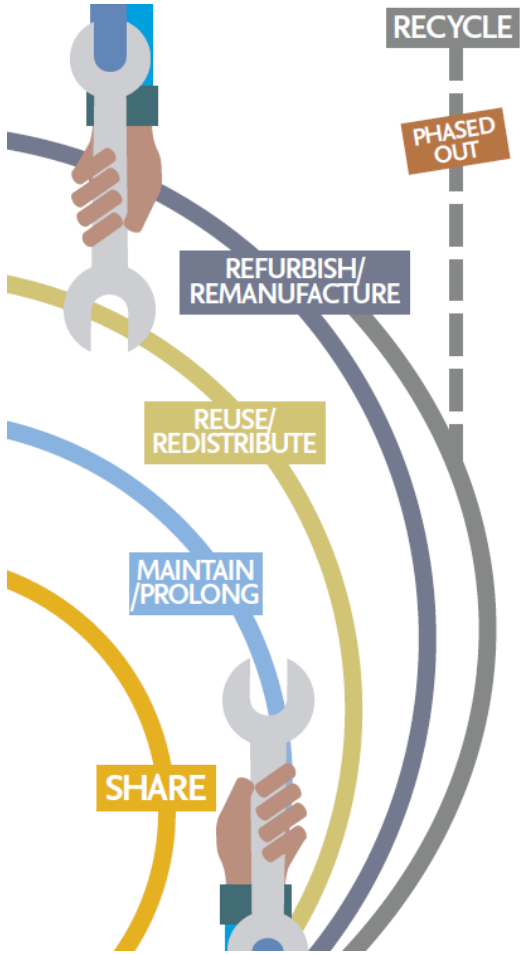
Reduce
Reuse
Recycle

6R

Rethink
Refuse
Reduce
Reuse
Repair
Recycle

12R

Reduce
Reuse
Recycle/reclaim
Repair
Refurbish/recondition
Remanufacture
Repurpose
Redesign
Research/develop
Reskill
Reverse (logistics)
Re-vision (production)

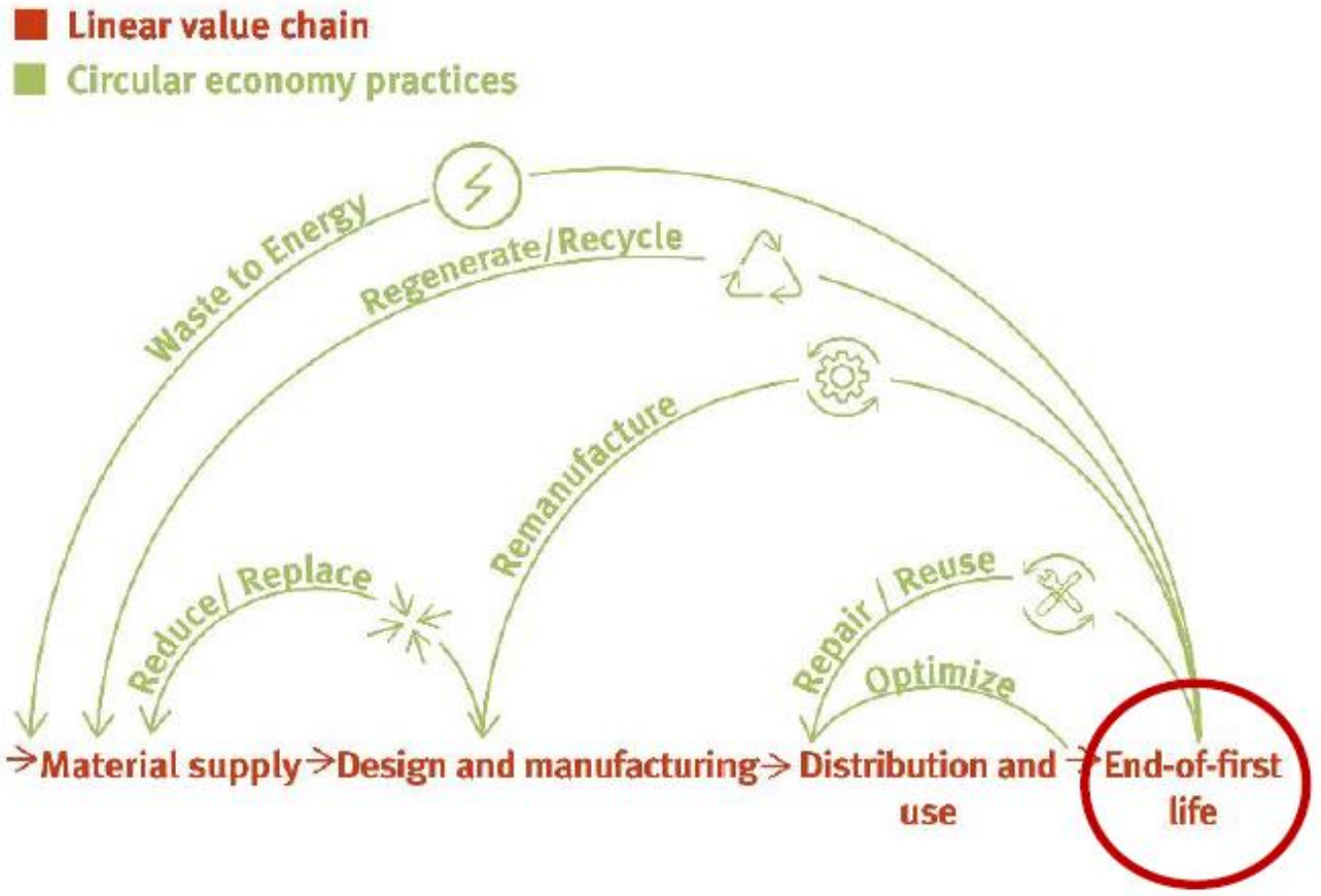


A Zsakay, 2020

Circular Economy

- Is an *"industrial economy"* that
  - Returns products, parts and materials into use several times along value chains
  - Adopts principles that
    - Products are designed to last
    - Value is maintained for as long as possible
    - Generation of waste and pollution is minimized
    - Renewable energy is used as much as possible

UNIDO 2020



Circular *industrial* economy

Innovation

- Products, materials & technologies
- Business models
- Consumption patterns/ lifestyle

Elaborated from Van Berkel et al 2020 and ETC, 2021

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Life Cycle Stages

- Materials
- Design
- Production & distribution
- Use
- End of life

Elaborated from Van Berkel et al 2020 and ETC, 2021

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Enablers
- Education & behavioral change
- Public policy
- Markets

Elaborated from Van Berkel et al 2020 and ETC, 2021

Circular *industrial* economy

Circular Strategies

- Resource Circularity
- Resource Efficiency
- Resource Switch

Innovation

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Elaborate
2020 and ETC, 2021

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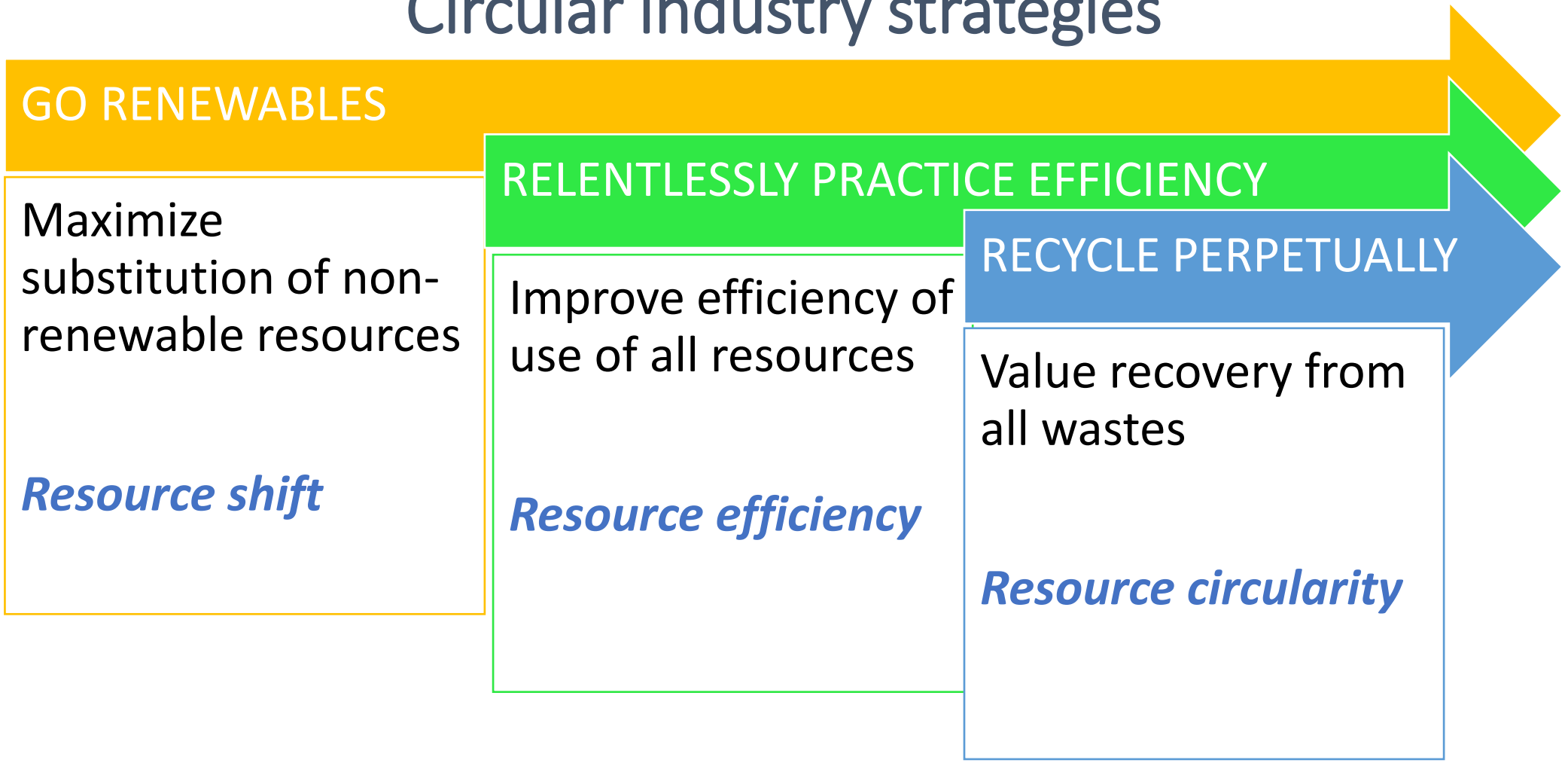
Elaborated from Van Berkel et al 2020 and ETC, 2021

Circular industry strategies

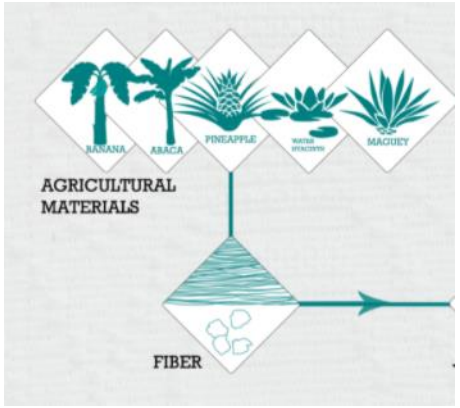


Van Berkel & Fadeeva, 2020

Provided by Nature

Resourced from nature

Alternative textile fibers



Solar process heating & cooling

Inspired by nature

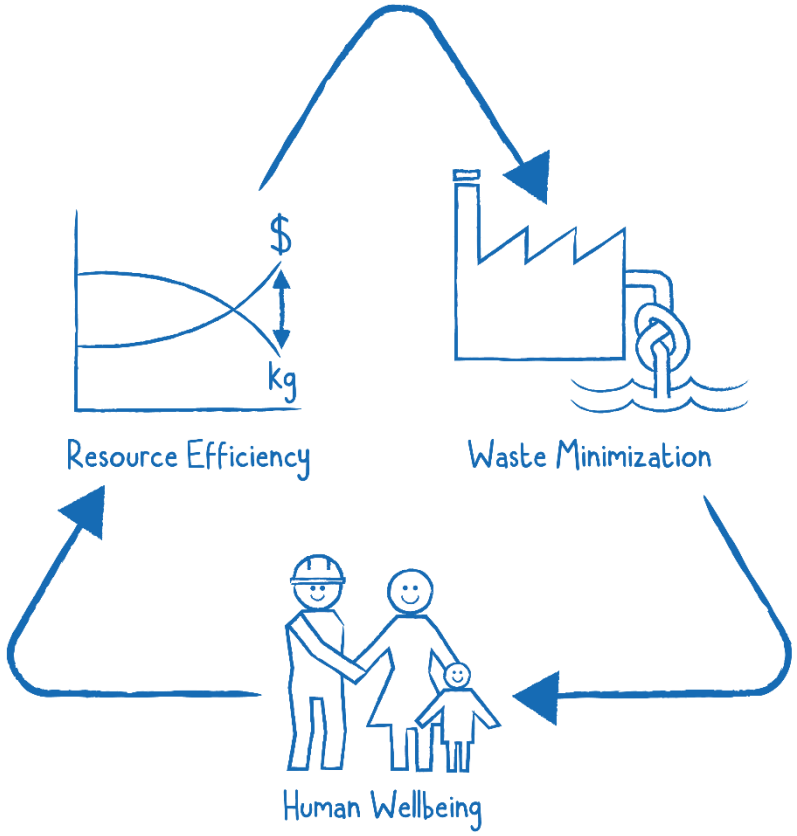
Industrial applications of enzymes

Flow chemistry continuous reactors

FLCTD
Promoting Innovation and Deployment of Low Carbon Technologies

Resource SHIFT

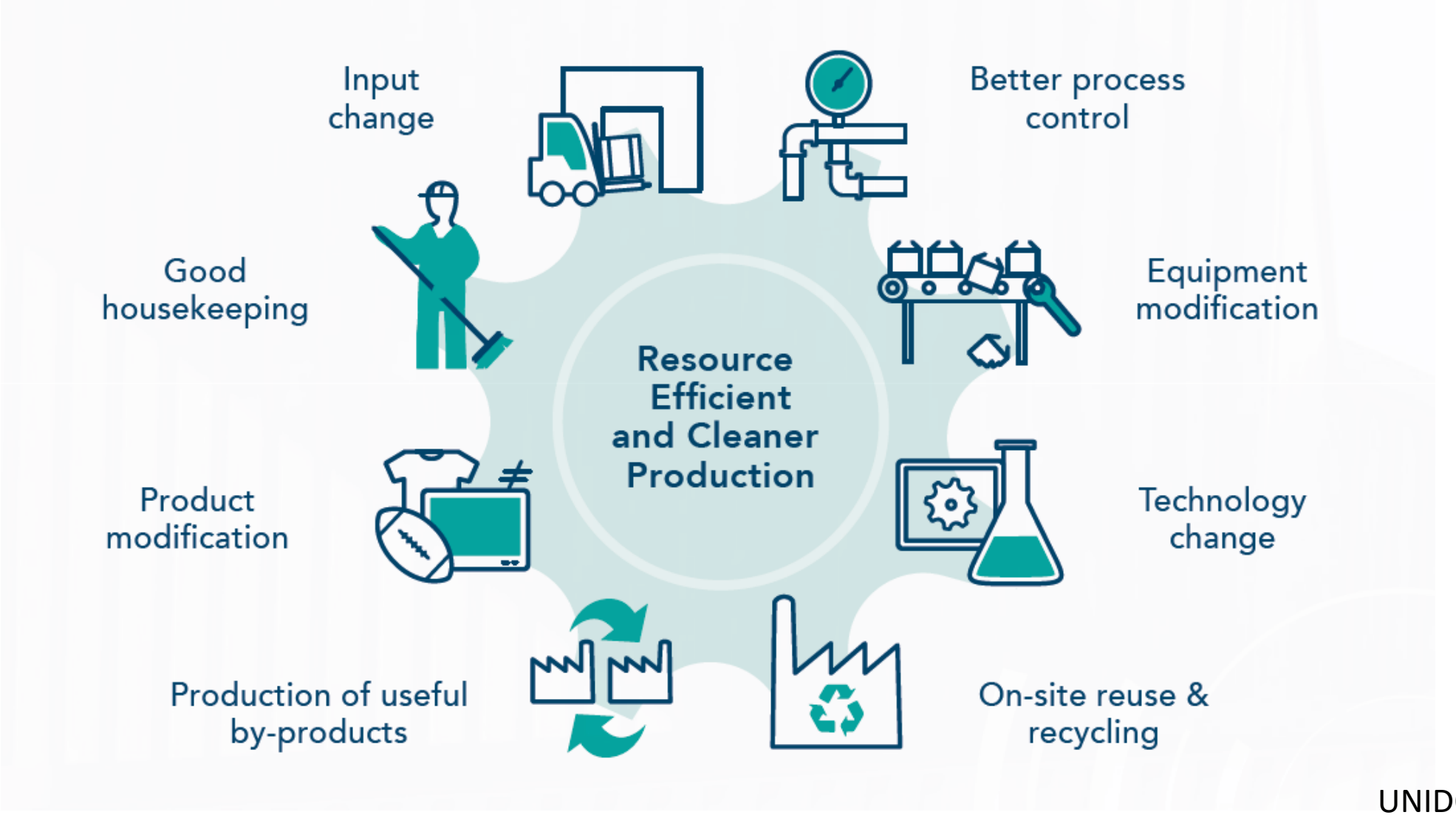
Resource Efficient and Cleaner Production



- Improve efficiency of use of materials, water and energy
  - Thereby
- Minimize the generation of wastes, effluents and emissions
  - Thereby
- Improve occupation and community health and wellbeing
  - Thereby
    - Improve productivity etc.

Resource EFFICIENCY

Resource EFFICIENCY



UNIDO, 2015

RECP food sector in Indonesia

- Pagottan Sugar Mill
  - RECP measures
    - Installation of cooling tower
    - Installation of vapor line juice heater
  - Results
    - Energy conservation:7.6%
    - Water conservation: 3.9%
    - GHG reduction: 4.8%
    - Invested: USD115,500
    - Annual savings: USD 102,500

- Wahyu Pradana Binamulia
  - Fish and seafood processing
  - RECP measures
    - Scheduled and regular preventive maintenance
    - Access restrictions to cold storage, blast freezer and machine room
    - First In First Out freezer management
    - Reuse of second washing water for initial washing
  - Results
    - Energy conservation: 59%
    - Water consumption: 38%
    - GHG reduction: 52%
    - Invested: nihil
    - Annual savings: USD98.770

Resource EFFICIENCY

Resource Efficient and Cleaner Production INDONESIA

www.recpindonesia.org

RECP textile sector in Indonesia

Indicator	Superbtex (spinning mill)	Argo Pantes (integrated mill)	Saudaratex (garment factory)	Tiara Utama (garment laundry)
Specific Energy Consumption	-4%	-42%	Power -20% Coal -25%	Power -9% Coal -43%
Specific Water Consumption	n/a	-6%	-24%	-39%
Specific Pollution/Effluent Load	n/a	-33%	-24%	-39%
Chemical Consumption	n/a	-23%	n/a	n/a
GHG emissions	-4%	-9%	-25%	-42%
Annual cost savings	USD 47,000	USD 1.08 million	USD 538,000	USD143,00



Resource EFFICIENCY

Resource Efficient and Cleaner Production INDONESIA

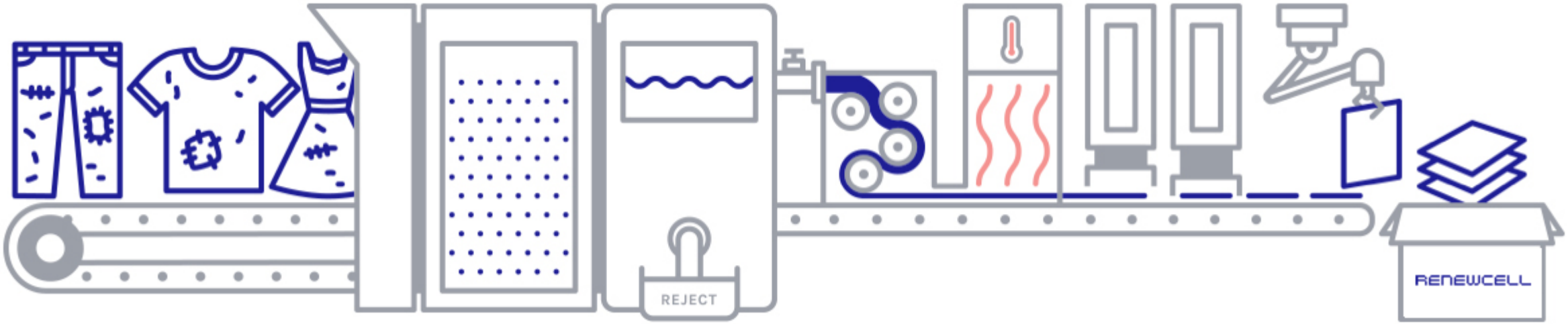
www.recpindonesia.org

Circular innovation: recycled polyester

www.ecohike.in

Resource CIRCULARITY

Circular innovation: chemical recycling of viscose



Cleans, decolors and repulps high cotton and viscose waste garments in circular viscose

RENEWCELL

www.renewcell.com

Resource CIRCULARITY

Circular innovation: mechanically regenerated denim

www.bossa.com.tr

Resource CIRCULARITY

Circular innovation: water-efficient solution dyeing

- Reduction of water consumption by 80%
- Fewer chemicals and CO2 emissions
- Lower energy consumption
- Long-lasting color as the fabrics fade less

www.burton.com

Resource CIRCULARITY

Circular innovation: waterless CO_2 dyeing

NO COMPROMISE

DyeCoo

Zero water
Zero waste water

Zero process chemicals
98% dye uptake

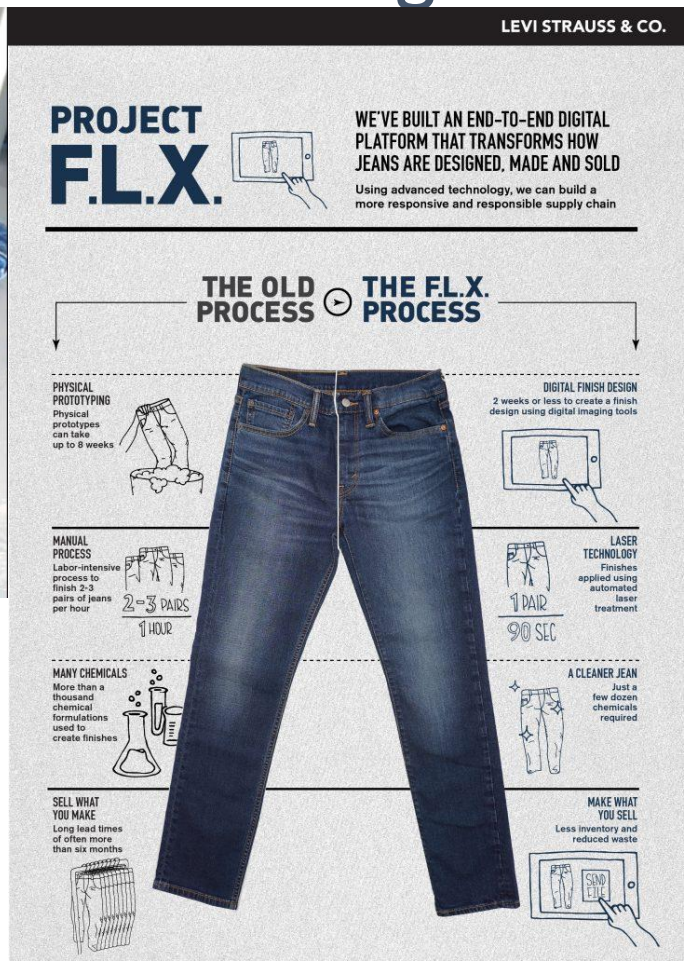
Vibrant colours
1/4th floorspace
40% faster
63% lower energy

Suitable for virtually all synthetic fabrics and yarn. From woven to non-woven and knits, CO_2 dyes various fabric constructions and types of permeability
12 machines in commercial operation in Taiwan, Vietnam and Thailand

www.dyecoo.com
www.nike.com

Resource CIRCULARITY

Circular innovation: waterless denim finishing



www.levistraus.com

Resource CIRCULARITY

In Closing

- Circular and green economy
  - Can mean different things to different people, yet goes much beyond recycling
    - Circular – physical products and value chains with perpetual materials and resource flows
    - Economy – business models that create and retain value
  - Are designed in and provide a new lens for business, product and process innovation
  - Is achievable through
- *Industrialization* of
  - Resource switch
  - Resource efficiency
  - Resource circularity

Thank you

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