Circular Economy means sustainable use

2020-21 Executive Training for Policymakers on the 2030 Agenda and the SDGs, Incheon City, 24 March 2021

Dr h.c.mult. Walter R. Stahel
Full Member of the Club of Rome,
Visiting Professor, Fac of Engineering, University of Surrey
www.product-life.org, wrstahel2014@gmail.com
Shower economics – consumer goods

inflow measured (GDP)

Production

in-FLOW

Consumption

outflow estimated

“waste” management

food and fodder, energy, water, drinks

out-FLOW
Bath-tub (circular) economics – durable goods

Production

water in-FLOW
quantity & quality

Use

STOCK
quality & quantity

outflow
estimated

“waste”
management

water outFLOW

measured
(GDP)

stock and
use time
unknown

outflow
estimated
The origins of Circularity:

1. **Nature**: water, wood, wool, leather, food, stones, minerals.

2. **Infrastructure**: designed for durability

3. **Good husbandry** (poverty, scarcity): use it up, wear it out, make it do or do without.
Nature

Nature is circular by evolution. There is no waste in Nature, used resources become food for other organisms.

Therefore: all waste is man-made.
Infrastructure

- functional design for durability,
- often in public ownership,
- operation and maintenance often neglected to “save money”,
- may become part of cultural heritage,
- are local and immobile.
Early man-made objects

- are made to last from natural materials like wood, wool, leather, stones, minerals,
- their use is governed by good husbandry and often poverty, scarcity: use it up, wear it out, make it do or do without.
- discarded objects are within Nature’s circularity, but absorption capacity?
The circular economy’s **bio-cycles** need sustainable production and consumption.

**Shower economy of consumer goods** is

- based on a sustainable use of natural resources (soil, water, biodiversity) and an efficient harvest management,
- on waste prevention in food, fodder, energy, water and drinks production and distribution,
- smart consumption-management to prevent water, food, energy wastes in storage & use.
appropriate for rural areas

‘organic’ waste water treatment plants are low-cost (no ‘bricks’ or pumps), create biotopes and flood basins, have no sludge (waste) issue – but need space (4 m²/habitant).
Tata Steel has developed a mobile ‘canning line concept’, which enables farmers to process and can their produce on the farm.

Rent-a-factory reduces food waste at the source and gives farmers an additional revenue.
Anthropogenic objects and materials

Qualitatively:
the Anthropocene unleashed scientific progress

- **physics**: the nuclear bomb & civil uses (health),
- **chemistry**: synthetic materials, plastic, agrochemicals, pharmaceuticals, hormones,
- **metallurgy**: multitude of metal alloys.

These new materials are unknown to Nature.
Thus all synthetic materials are man-made and impose a man-made producer responsibility at the end of their use.
Turning point of overall material output of human activities to that of natural biomass

Quantitatively:

• in 2020, the human-made mass, referred to as the anthropogenic mass, surpassed all global living biomass of about 1.1 teratonnes
• the anthropogenic mass has recently doubled roughly every 20 years,
• for each person on the globe, anthropogenic mass equal to more than the average persons bodyweight is now produced weekly
• additional new production is unsustainable!
The solution? The sustainable use of materials and objects in the bath-tub
Circular Economy, whose tech-cycles maintain quantity and quality of stocks of:

- **natural** capital (EU bioeconomy: arable land, water, forests, fish stock, biodiversity),
- **human** capital (labour, skills, expertise, wisdom),
- **cultural** capital (monuments, landscapes, music),
- **financial** capital (investments, wealth),
- **manufactured capital** (materials, objects),
- **immaterial** assets (embodied water, CO$_2$; liability).
from end-of-life to as-pure-as-new resources (atoms)

the era of ‘D’

Point of end-of-service-life

production

Point of Sale or Service

product use

the era of ‘R’

the circular user economy maintaining value, quality & quantity of stock

novel systems materials, components

A mature bath-tub circular economy

spare less repairs, remanufacture better than new

A bath-tub Circular Economy is local, cultural and differs between regions

• developing countries must be able to create stocks of infrastructure and objects (*fill up the bath tub*),

• industrial countries must repair & upgrade qualitatively, not replace, the existing stocks,

All nations can develop circular sciences (circular energy, chemistry, metallurgy) and regional workshops to exploit local skill pools which create local jobs through virtuous loops.
understanding the underlying local issues – science and tradition
The Circular Economy is about using, not consuming, regional stocks

- extend the service-life of objects (e.g. reuse, repair, remanufacture, upgrade),
- exploit sufficiency to create ‘more from less’: e.g. green vineyards, waterless urinals, plus-energy buildings, ploughing at night.
Societal benefits of the Circular Economy micro-eco: product-life extension creates local jobs and prevents waste (substituting manpower for energy)
Policymakers’ motivation & actions

Why? stocks create resilience, demand caring!

• abolish labour taxes on workers active in maintaining natural, human, cultural and manufactured (infrastructure, objects) assets,
• favour public procurement of systems performance, not products (e.g. Incheon bridge),
• promote vocational training for repair and maintenance workers, and the creation of local repair and reuse shops,
• promote “circular legislation”, e.g. the right to repair, a full producer (take-back) liability.
Who takes decisions in the circular economy?

policymakers and owner-users,
More details in this guide, by Walter R. Stahel, June 2019, Routledge
thank you for listening

Dr h.c. Walter R. Stahel, Visiting Professor, University of Surrey
Founder-Director, The Product-Life Institute, Geneva
www.product-life.org, wrstahel2014@gmail.com