

# Sustainable Engineering – an approach

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# What is sustainability?

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What is  
sustainability?

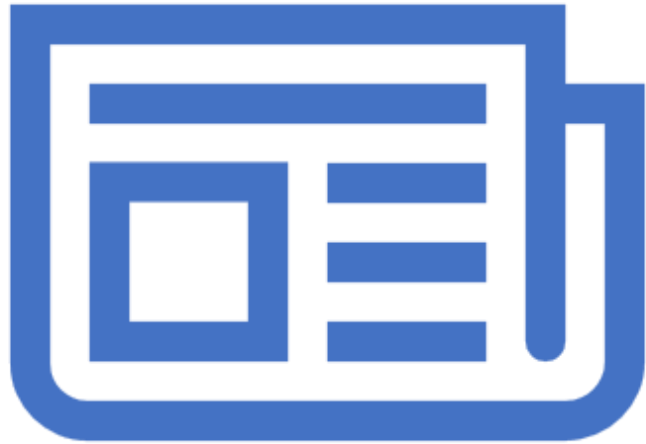
Sustainability is a concept that promotes the ability to meet the needs of the present generation while protecting the ability of future generations to meet their own needs

The triple  
bottom line!

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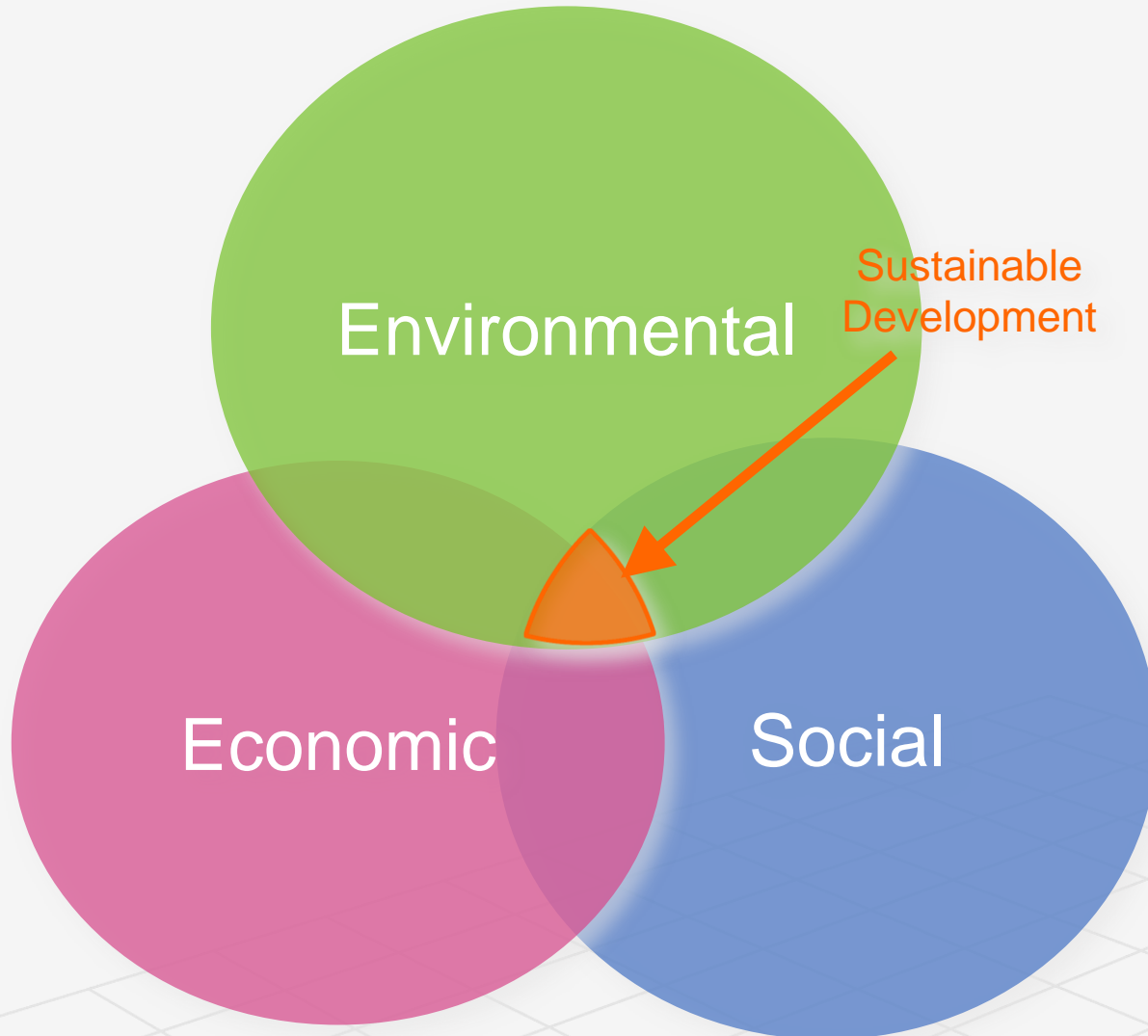


# The 3 Pillars



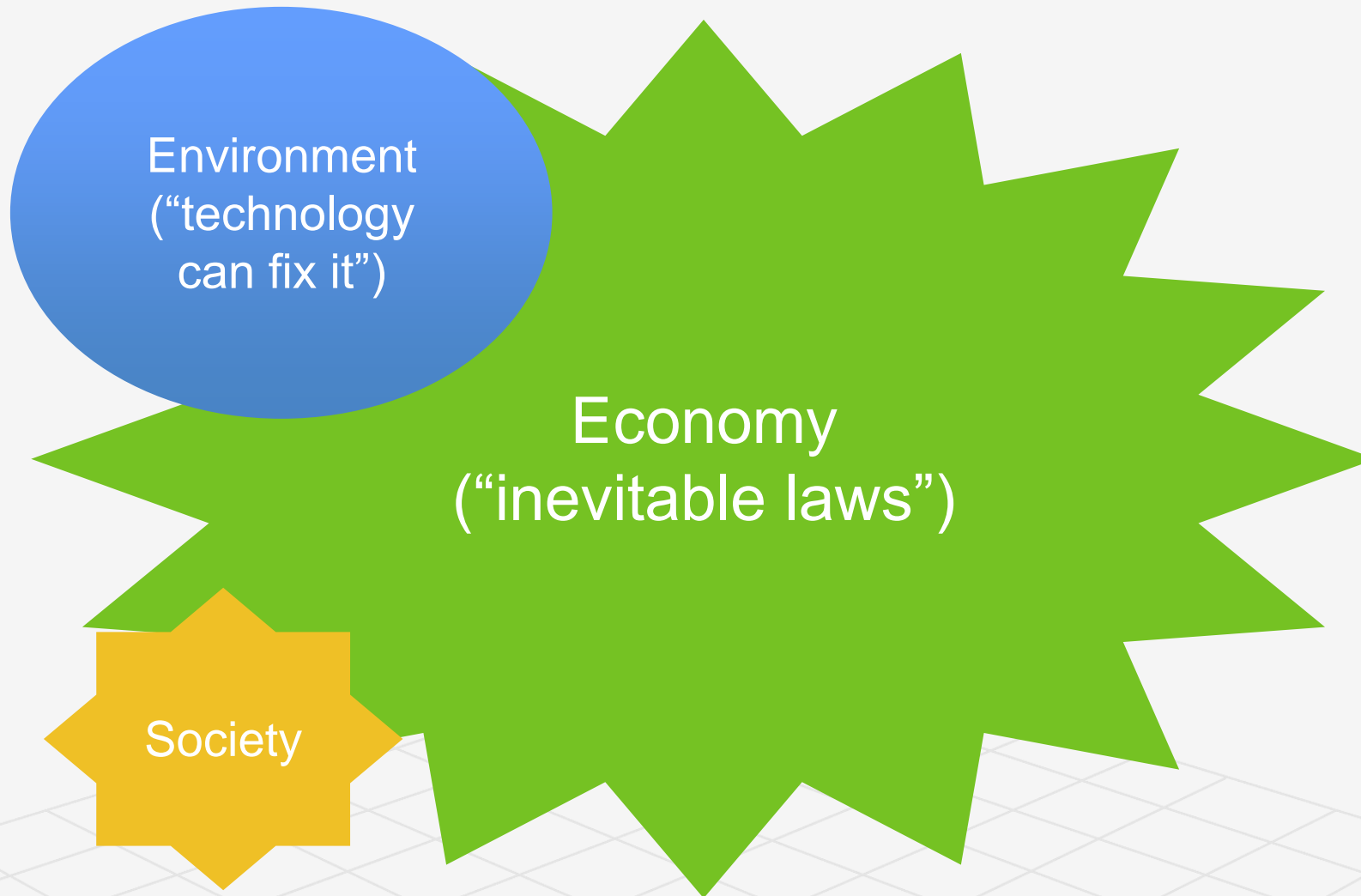
- **People**
  - Fair practices for all people and does not exploit interest of separate parties based on money, status or growth.
- **Planet**
  - Management of renewable and non renewable resources while reducing waste.
- **Profit**
  - Financial benefit enjoyed by the majority of society.

# Engineering Sustainable Development aims to balance the three elements



- **Economic:** what things cost - and how to make a business out of providing infrastructure, goods or services
- **Environmental:** what impact those things have on nature and the earth's support systems - which are finite
- **Social:** how those things serve the needs and quality of life of people and their communities

# The current world view - relative importance?



# Traditional Vs Sustainable Engineering

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## **Traditional Engineering**

**Considers the object or process**

**Focuses on technical issues**

**Solves the immediate problem**

**Considers the local context**

**Assumes others will deal with political, ethical, and societal issues**

## **Sustainable Engineering**

Considers the whole system in which the object or process will be used

Considers both technical and non-technical issues synergistically

Strives to solve the problem for infinite future

Considers the global context

Acknowledges the need to interact the experts in other disciplines related to the problem



# Engineers' designs have a critical sustainability impact

- “by the time the **design** for most human artefacts is completed....80-90% of their life-cycle economic and ecological costs have already been made **inevitable**”
- Or, in design: “All the really important mistakes are made on the first day”

“Natural Capitalism” - 1999

***So: to lead sustainable development, engineers must think differently - use a different design mentality - from that first day***



Engineers are part of the problem






Engineers are also part of the solution





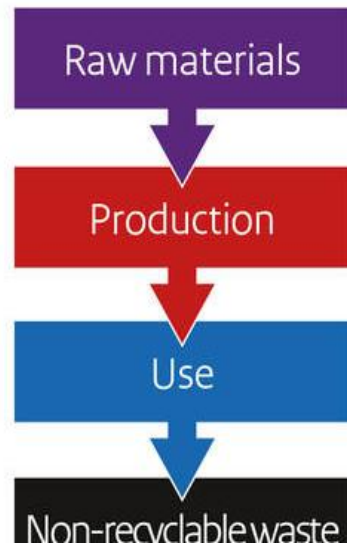
# Group work

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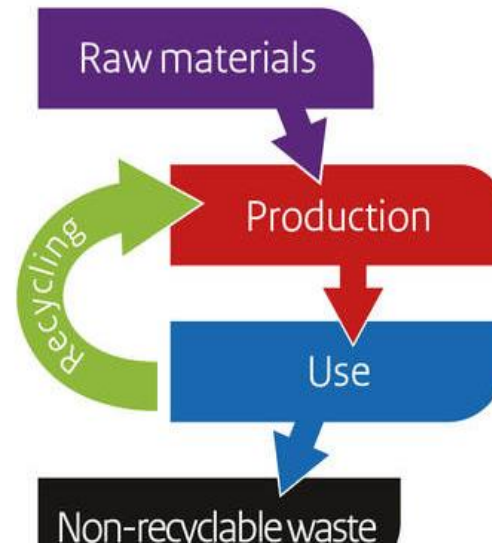
- Time – 30 min ( use of innovative way to present ideas)
  - Knowledge carousel – 5 min per presentation
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# Circular Economy

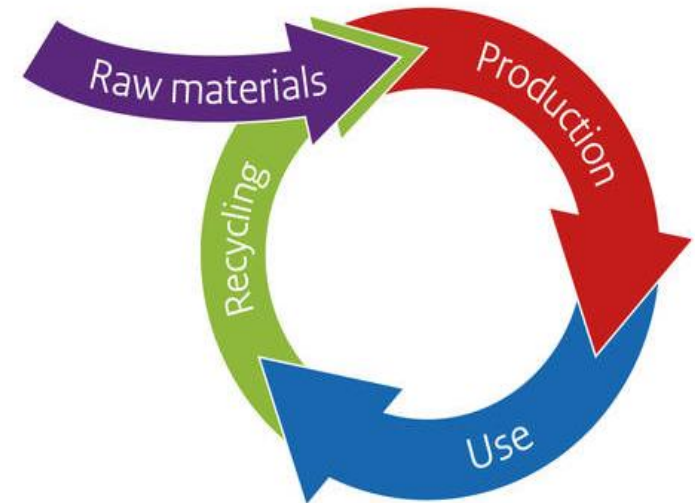
Linear economy



Reuse economy



Circular economy



# What is a circular economy?



Looking beyond the current take-make-waste extractive industrial model, a circular economy aims to redefine growth, focusing on positive society-wide benefits.



It is based on three principles



Design out waste and pollution



Keep products and materials in use



Regenerate natural systems