# **Circular economy as a response to climate change: Morocco case**

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#### Contents

- I Climate crisis context
- **II What is Circular Economy ?**
- **III Key Characteristics**
- **IV Enabling Factors**
- **V Some Morrocan models**



Our ' Take – Make – Waste ' linear economy is heavily extractive , resource intensive and produces greenhouse gases (GHGs) that are causing the climate crisis.

#### Global GHGs emissions by economic sector per year



Source : IPCC, « IPCC's Fifth Assessment Report (AR5) »

- ✓ There is an urgent need for climate action : The global GHG emissions is not yet bending
- ✓ The world is still not close to being on track to the temperature rise to 1.5°C in 2100
- ✓ Current emissions show no sign of peaking any time soon and are instead leading to an increase of 3°C by 2100, or even 4°C with an unchanged energy system















Urgent coordinated action and far-reaching transformations will be needed :

- ✓ Nations have to increase their ambitions fivefold to meet the emission targets consistent with the 1.5°C scenario
- ✓ Decarbonisation of the energy system is necessary and needs to accelerate. ( Renewable energy and energy efficency are the key)
- ✓ A transformation is also needed in the way goods are produced and used.





#### II – What is circular economy?

**Circular economy** is an economic development designed to decouple growth from finite resource consumption.

An economic approach designed to benefit businesses, society and Environement **PROFIT** 



#### **II – What is circular economy ?**

**Circular economy relies on 3 principles** 

**Design out** waste and pollution

Keep products, components and materials at their highest value and in use

**Regenerate** natural systems



**II – What is circular economy ?** 

#### What are the benefits ?

**Economic benefits** : opportunities for economic Growth and innovation

**Social benefits** : sustainable consumer behaviour and job Opportunities

**Resource benefits** : improving resource security and decreasing import dependancy

**Environemental benefits**: less negative environemental impact, **less emissions** 



II – What is circular economy?

#### *How does the circular economy reduce GHG emissions ?*



#### A road map towards the SDG







1. Less Input and use of natural resources

2. Increased share of renewable and recyclable resources and energy

- **3.** Reduced emissions
- **4.** Fewer material losses/ residuals

 Keeping the value of products, components and materials in economy

#### **1.** Less input and use of natural resources

- Minimised and optimised exploitation of raw materials, while delivering more value from fewer materials
- ✓ Reduced import dependence on natural resources
- Efficient use of all natural resources
- Minimised overall energy and water use



Efficient use of resources and materials

**2.** Increased Share of renewable and recyclable resources and energy

- ✓ Non- renewable resources replaced with renewable ones within sustainable levels of supply
- Increased share of recyclable and recycled materials that can use replace the use of virgin materials
- Closure of material loops
- sustainably sourced raw materials



#### **3. Reduced Emissions**

- Reduced emissions throughout the full material cycle by using less raw material and sustainable sourcing
- ✓ Less pollution through clean material cycles



- 4. Fewer material losses / residuals
- ✓ Build up of waste minimised
- Incineration and landfill limited to a minimum
- Dissipative losses of valuable resources minimised



**5.** Keeping the value of products, components and materials in economy

- extended product lifetime keeping the value of products in use
- ✓ Reuse of components
- ✓ value of materials preserved in the economy through high-quality recycling



- ✓ Eco-design & Eco-Innovation
- Repair, refurbishement and remanufacture
- ✓ Recycling
- Business models
- ✓ Governance, Skills and knowledge

#### Factor 1: Eco-design & Eco-innovation

- ✓ Reuse of components products designed for a longer life
- ✓ product design based on the sustainable and minimal use of resources
- high-quality recycling of materials at the end of a product's life
- technological innovation
- organisational innovation



#### Factor 2: Repair, refurbishement and remanufacture

 repair, refurbishement and remanufacture given priority, enabling reuse of products and components

#### **Factor 3: Recycling**

- ✓ High-quality recycling of as much waste as possible
- Use of recycled materials as secondary raw materials
- Well-functionning markets for secondary raw materials



**Factor 4: Business Models** 

- focus on offering product-service systems rather than product ownership,
- ✓ collaborative consumption
- industrial symbiosis : collaboration between companies whereby the wastes – by products of one become a resource for another

Factor 5: Governance, skills and knowledge

- awareness raising about changing lifestyles and priorities in consumption patterns
- ✓ participation, stakeholder interaction and exchange of experience
- ✓ Education
- ✓ Data, monitoring and indicators

#### On the way of a circular economy process

For a territory

- Building a contextual and systemic approach
- Life cycle Management of products and activities
- Identifying waste mapping
- Identifying the stakeholders

Territory : Local Community – City – Industrial zone – a group of companies ...

### **Circular Economy**

### What about Morocco



#### Stratégie Nationale de l'Environnement et du <u>Développement Durable : Les 7 enjeux prioritaires</u>



## Crushed Wooden pallets : 5000 t/year



#### **ECONOMIE CIRCULAIRE ENERGIE: SCHÉMA ZERO CO2**

### **CARBONE ZÉRO**



- 98% d'émissions de CO<sub>2</sub> évitées par rapport à une usine équivalente
- +2% d'émissions de CO<sub>2</sub> compensées

MAINTENANCE CENTRALE & DÉVELOPPEMENT DURABLE

**GROUPE RENAULT** 

#### Fès City is enlightened using BIOGAS Energy produced from waste



**Public Lighting for Fes using BIOGAS** 



Décharge contrôlée ONE

#### **25% CLEAN and RENEWABLE ENERGY**

For 1 300 000 residents



#### **GROUPE ECOMED**









#### **Controlled Landfill of Laayoune City Electric energy produced by Biogas**





### **KILIMANJARO ENVIRONNEMENT**

Kilimajaro Environnement transforms waste to energy, using technology to bridge two worlds the waste generators and the energy users.

An integrated business Model protecting the environnement, creating sustainable jobs and fostering the local economy.



Transforming Waste Into Value





**SORT - RECYCLE - CELEBRATE** 

ETCO-GEST

### COLLABORATIVE INTEGRATED PLATFORM

FOR HOUSEHOLDS WASTE MANAGEMENT AND RECYCLING

### Mobile Apps for and Innovation as a Major Competitive Advantage

#### **Eko-Geste Pro for Professionals Eko-Geste Dari for Households**







#### **Some References**

- Ellen MacArthur Foundation, Completing the picture : How the Circular Economy Tackles Climate Change (2019)
   www.ellenmacarthurfoundation.org/publications
- Circular economy in Europe, developing the knowledge base.
  European Environment Agency. N°2/2016.
- www.ecomed.ma
- https://ekogeste.com/

### Thank you for your attention !

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