



**CIECTI**

Centro Interdisciplinario  
de Estudios en Ciencia,  
Tecnología e Innovación

CIECTI / **SEMINARIO INTERNACIONAL**



**RECURSOS NATURALES Y DESARROLLO:  
DESAFÍOS PARA LA CTI EN EL SIGLO XXI**

CENTRO CULTURAL DE LA CIENCIA (C3)

Godoy Cruz 2270

CABA

# **What kind of innovations are required for a global circular economy?**

Ernesto Hartikainen

Circular Economy Specialist



SITRA



# 5 key facts about Sitra

1. A gift from Parliament to the 50-year-old Finland.
2. An independent foresight agency: futurologist, researcher, visionary, developer, experimentalist, partner, trainer, networker.
3. Funded by returns on endowment capital and capital investments.
4. Envisages Finland as a successful pioneer in sustainable well-being.
5. Its vision is supported by three themes, six focus areas and dozens of projects.

## +1

Building our future  
together



SITRA

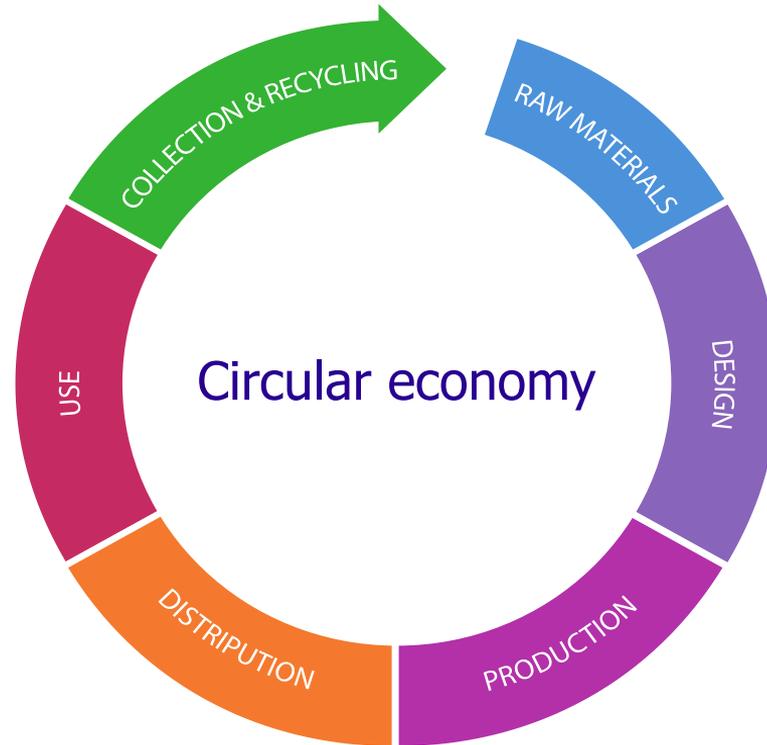
VISION

Finland will succeed as a  
pioneer of sustainable  
well-being.

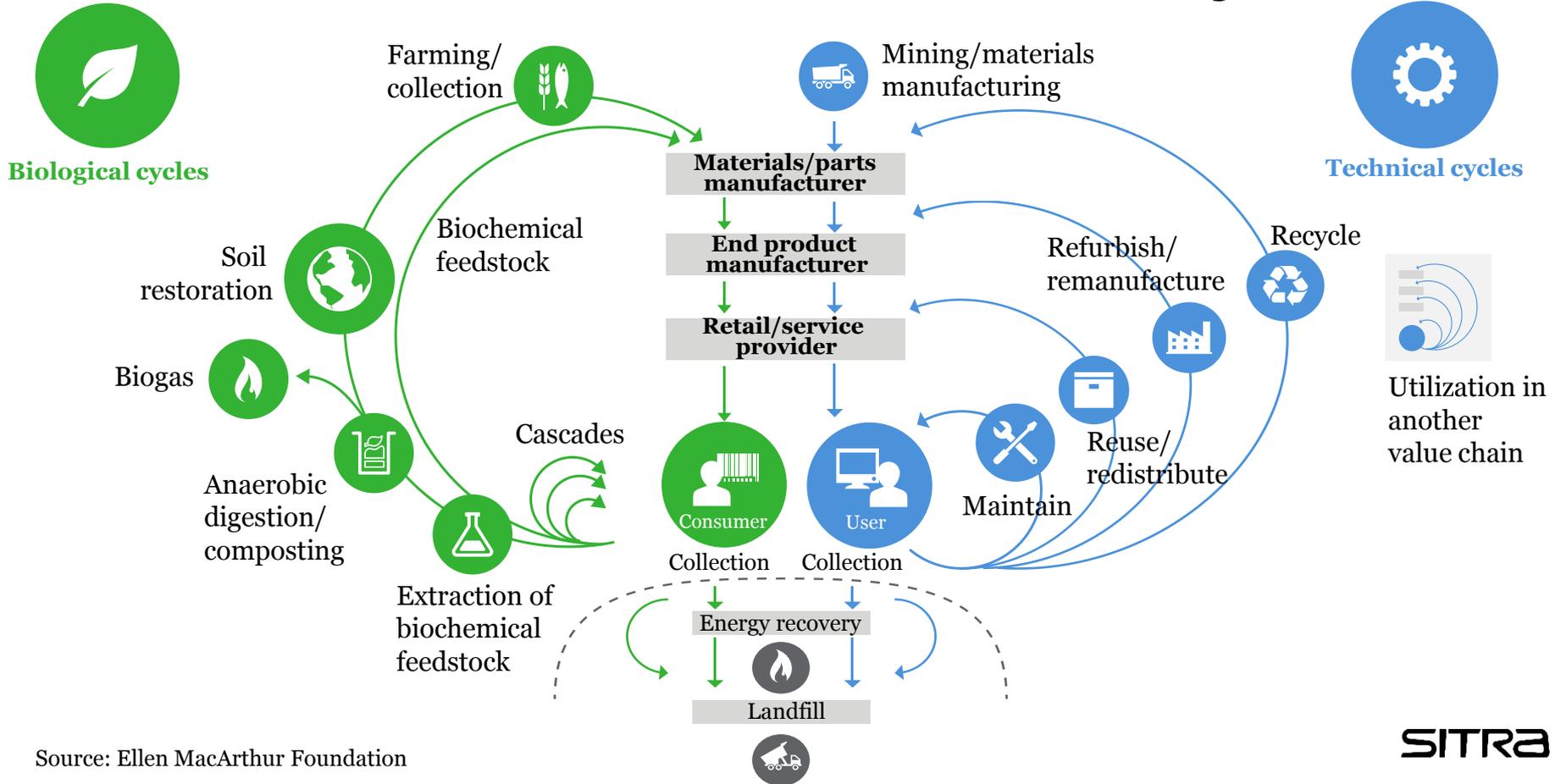


SITRA

# Linear economy



# A system restorative by design retains more volume and value within the economy



# Estimations about the business potential of the Circular Economy

Additional global economic output by 2030:

**\$4.5 trillion**

By 2050:

**\$25 trillion**

(Accenture 2015)

Yearly business potential in Finland by 2030:

**€2-3 billion**

(Sitra, McKinsey, Gaia)

Net benefit for Europe by 2030:

**\$1.8 trillion**

(Ellen MacArthur Foundation 2015)

Savings for EU businesses:

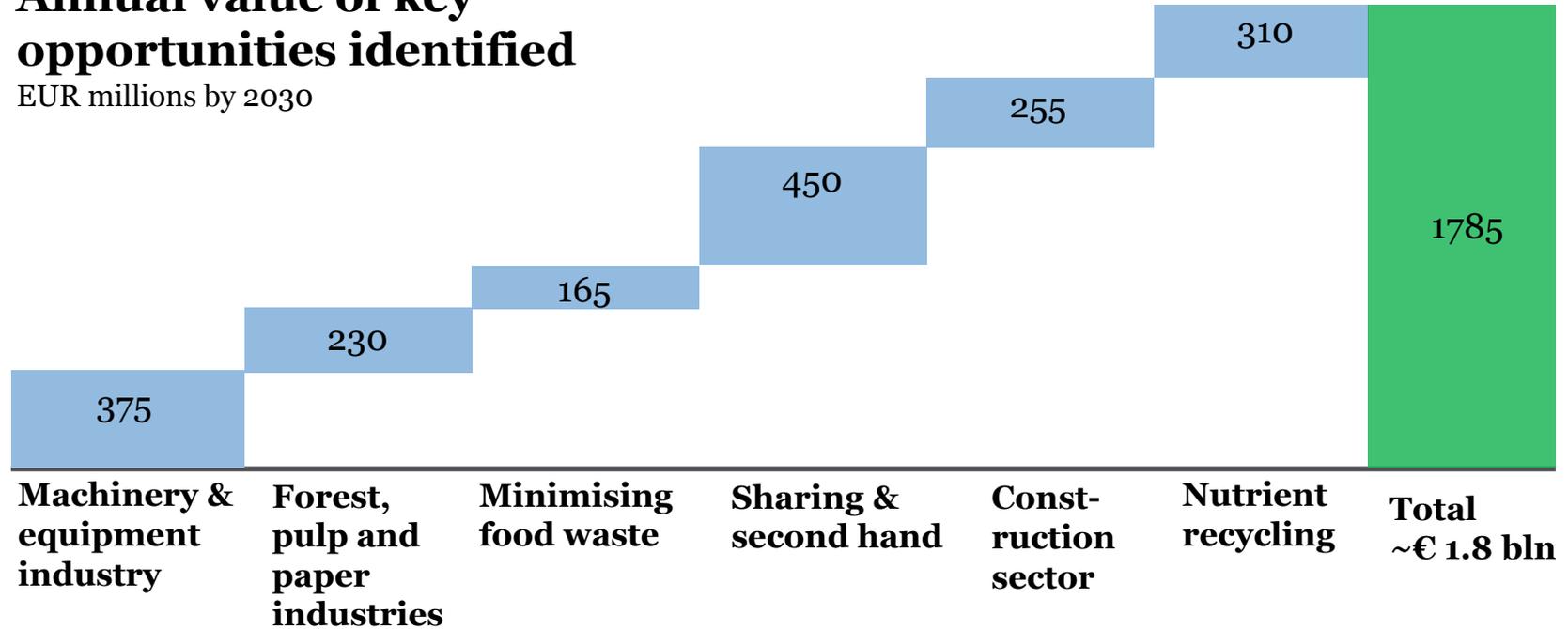
**€ 600 billion**

(European Commission)

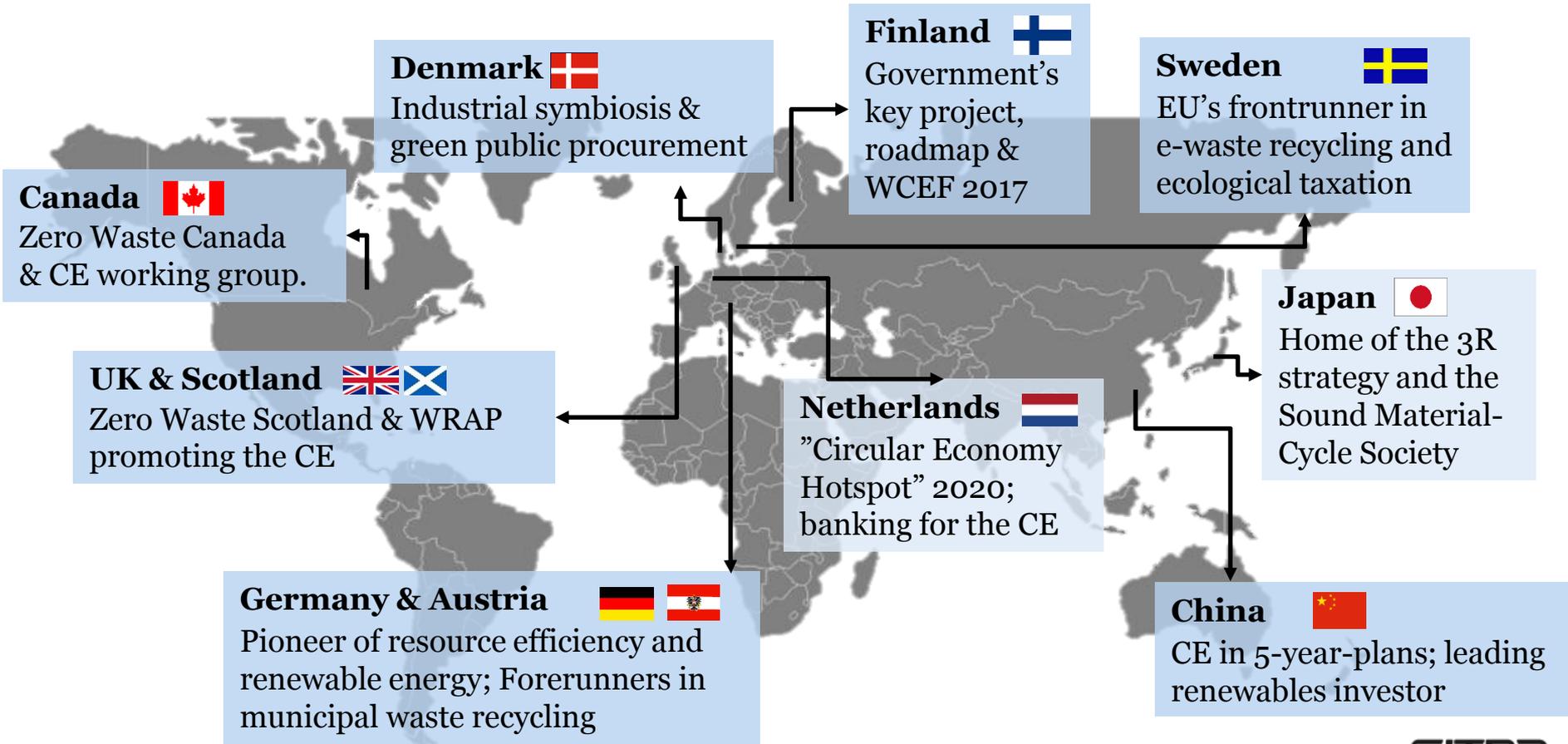
# Some Circular Economy opportunities for Finland

## Annual value of key opportunities identified

EUR millions by 2030



# Circular Economy advances across the globe



# **WHAT IS THE ROLE OF INNOVATION FOR A CIRCULAR ECONOMY?**

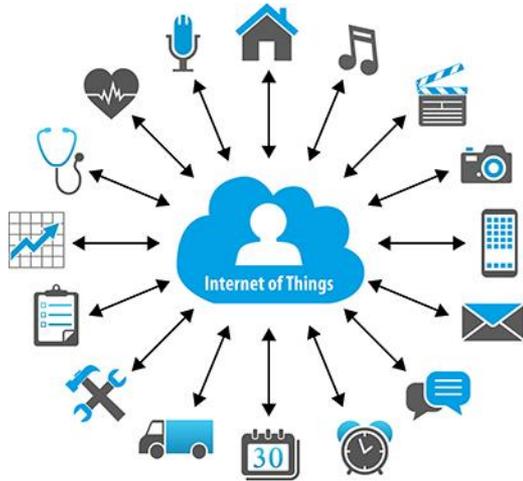
# Innovation

- “Innovation is: production or adoption, assimilation, and exploitation of a value-added novelty in economic and social spheres; renewal and enlargement of products, services, and markets; development of new methods of production; and establishment of new management systems. It is both a process and an outcome.”

Crossan and Apaydin (2010)

# **TECHNOLOGY INNOVATION**

# Circular technologies



# **BUSINESS INNOVATION**

# Five business models for the circular economy



## **Product-life extension**

Products are used according to their original purpose for as long as possible or repaired and refurbished for multiple re-uses, thus reducing the need for purchasing and manufacturing new products.



## **Product as a service**

The customer pays for certain functions or performance and avoids the risks of ownership. The total costs of ownership remain with the service provider, with revenue being earned by means of, for example, a leasing or rental agreement.



## **Sharing platforms**

Digital-based platforms are used to promote the increased use of goods and resources and the extension of their life cycle, such as by renting, selling, sharing and re-use.



## **Renewability**

Renewable, recyclable and biodegradable materials, as well as the principles of eco-design, are preferred for products and their design. Fossil fuels are replaced by renewable energy.



## **Resource efficiency and recycling**

Technological development enhances resource efficiency in value chains, processes and products, and allows for more effective recycling. Side-streams are valuable raw materials for recycled products and materials.

# Example companies on the list



## **3 Step IT**

IT equipment  
life-cycle management

## **Lassila & Tikanoja**

Re-use  
of pallets

## **Valtra**

Remanufacturing  
of gearboxes



## **EkoRent**

Shared electric  
vehicle service

## **Enevo**

Optimisation  
of waste collection

## **Lindström**

Work uniforms  
as a service

## **RePack**

Reusable  
delivery packaging

## **Valtavalo**

LED lighting  
as a service



## **Shareit Blox Car**

Peer-to-peer car  
sharing service

## **Sharetribe**

Service for creating  
a marketplace website

## **Swap.com**

Innovative online  
consignment and thrift store



## **Kotkamills**

Easily recyclable  
consumer paperboard cups

## **Neste**

Renewable diesel  
made from waste and residues



## **Grano and TouchPoint**

New uses for advertising  
banners in business gifts  
through company co-operation

## **Eko-Expert**

Recycled blow-in  
insulation made  
from surplus  
mineral wool

## **Ekokem**

Used plastic  
as a recycled raw  
material

## **Rec Alkaline**

Recycled nutrients from  
alkaline batteries

## **Remake**

Designer clothing collection  
made from used clothes

# **SOCIAL INNOVATION**

Nations Unies

# Conférence sur les Changements Climatiques 2015

COP21/CMP11

Paris France



<p><b>1 NO POVERTY</b></p> 	<p>End poverty in all its forms everywhere for all people</p>	<p><b>2 ZERO HUNGER</b></p> 	<p>End hunger, achieve food security and improved nutrition and promote sustainable agriculture</p>	<p><b>3 GOOD HEALTH AND WELL-BEING</b></p> 	<p>Ensure healthy lives and promote well-being for all at all ages</p>	<p><b>4 QUALITY EDUCATION</b></p> 	<p>Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all</p>
<p><b>5 GENDER EQUALITY</b></p> 	<p>Achieve gender equality and empower all women and girls</p>	<p><b>6 CLEAN WATER AND SANITATION</b></p> 	<p>Ensure availability and sustainable management of water and sanitation for all</p>	<p><b>7 AFFORDABLE AND CLEAN ENERGY</b></p> 	<p>Ensure access to affordable, reliable, sustainable and modern energy for all</p>	<p><b>8 DECENT WORK AND ECONOMIC GROWTH</b></p> 	<p>Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all</p>
<p><b>9 INDUSTRY, INNOVATION AND INFRASTRUCTURE</b></p> 	<p>Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation</p>	<p><b>10 REDUCE INEQUALITIES</b></p> 	<p>Reduce inequality within and among countries</p>	<p><b>11 SUSTAINABLE CITIES AND COMMUNITIES</b></p> 	<p>Make cities and human settlements inclusive, safe, resilient and sustainable</p>	<p><b>12 RESPONSIBLE CONSUMPTION AND PRODUCTION</b></p> 	<p>Ensure sustainable consumption and production patterns</p>
<p><b>13 CLIMATE ACTION</b></p> 	<p>Take urgent action to combat climate change and its impacts*</p>	<p><b>14 LIFE BELOW WATER</b></p> 	<p>Conserve and sustainably use the oceans, seas and marine resources for sustainable development</p>	<p><b>15 LIFE ON LAND</b></p> 	<p>Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification</p>	<p><b>16 PEACE, JUSTICE AND STRONG INSTITUTIONS</b></p> 	<p>Promote peaceful and inclusive societies for sustainable development</p>
<p><b>17 PARTNERSHIPS FOR THE GOALS</b> </p> <p>Strengthen the means of implementation and revitalize the global partnership for sustainable development</p>							





**WHAT'S NEXT?**

# Future innovations for a global circular economy

- 1 Global pricing of externalities (e.g. taxing resource use, trade agreements)
- 2 New forms of financing the circular economy (e.g. impact investing)
- 3 Life-style changes and shifting consumption patterns (e.g. access over ownership)
- 4 Re-education and life-long learning (e.g. new skills for the circular economy)
- 5 A model for a socially fair circular economy (e.g. equitable distribution of benefits)



# RISE TO SHINE!



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**NOV 2017**