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Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Federal Department of Economic Affairs,
Education and Research EAER
State Secretariat for Economic Affairs SECO

Eco-Industrial Parks in Egypt - Workshop

Urban - Industrial Symbiosis (IS)

Contents

1. What is Industrial Symbiosis (IS)
2. International Examples
3. International Case Studies
4. Stats on IS matches in Zone from 2018
5. Egyptian Sample IS Case Studies
6. Quick Interactive Session – Q&A

1. What is industrial symbiosis?

1.1 What is industrial symbiosis?

- "Industrial symbiosis is the use by one company or sector of underutilised resources broadly defined (including waste, by-products, residues, energy, water, logistics, capacity, expertise, equipment and materials) from another, with the result of keeping resources in productive use for longer."
- **CEN Workshop Agreement – CWA 17354:2018**

Reducing use of virgin materials and associated cost and carbon implications

Moving resources through the waste hierarchy and increasing beneficial use

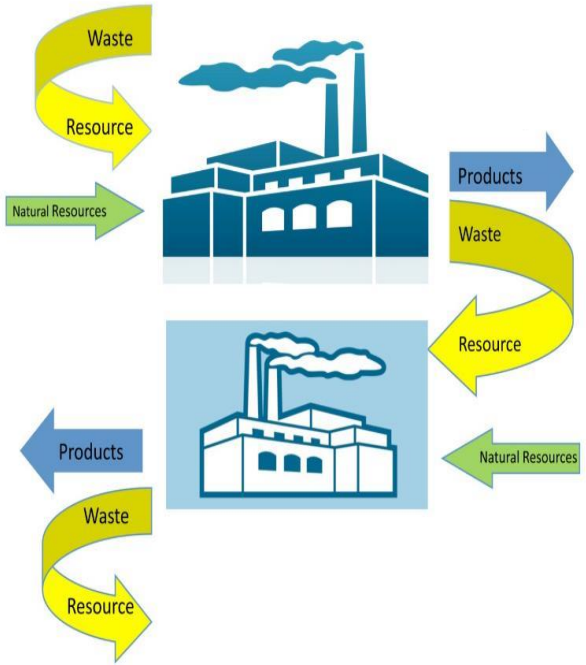
Promoting good practise and communication between industries

1.2 IS engages all

All sectors

All resources

Profitable transactions



Lombardi & Laybourn, 2012, Journal of Industrial Ecology 16(1):28-37

1.3 The waste hierarchy

Most favoured option

Least favoured option

Prevention / remove

Reduce

Reuse

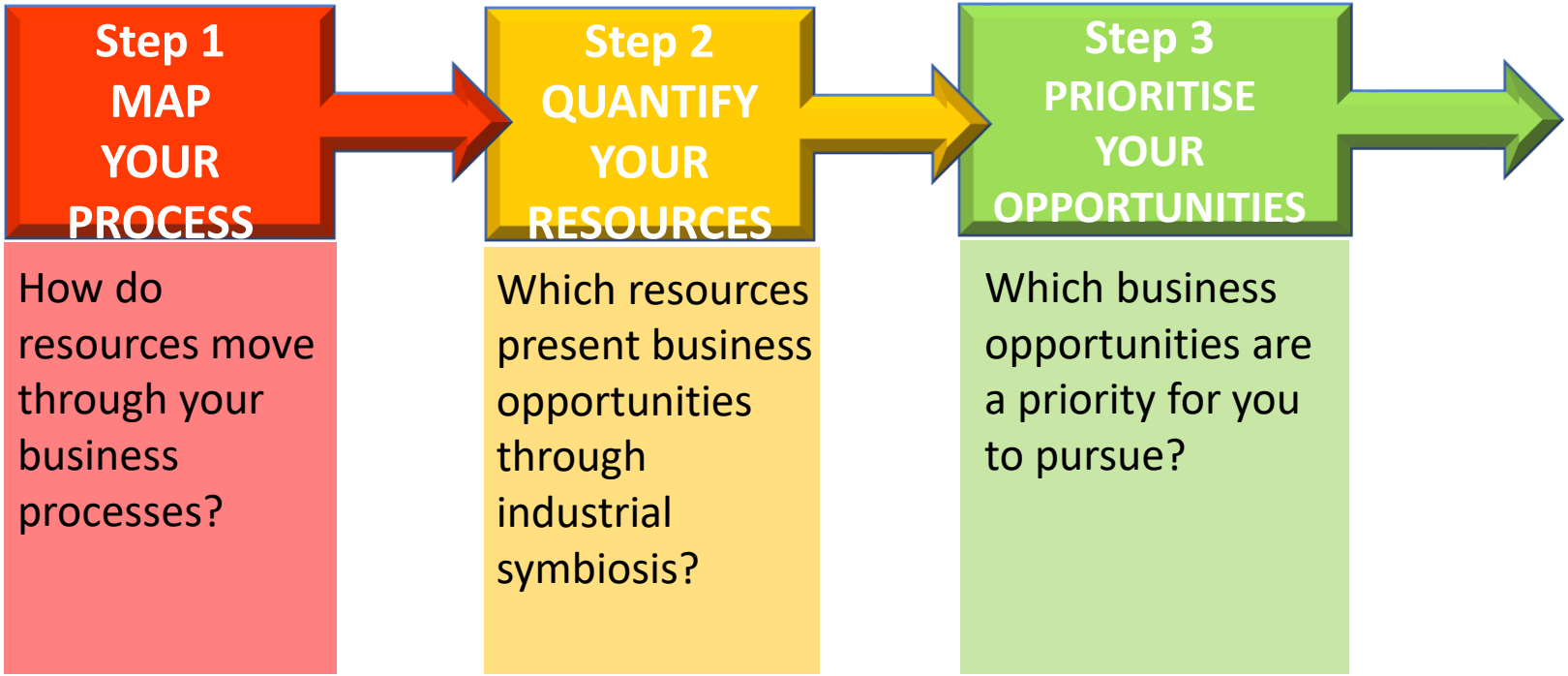
Recycling

Energy recovery

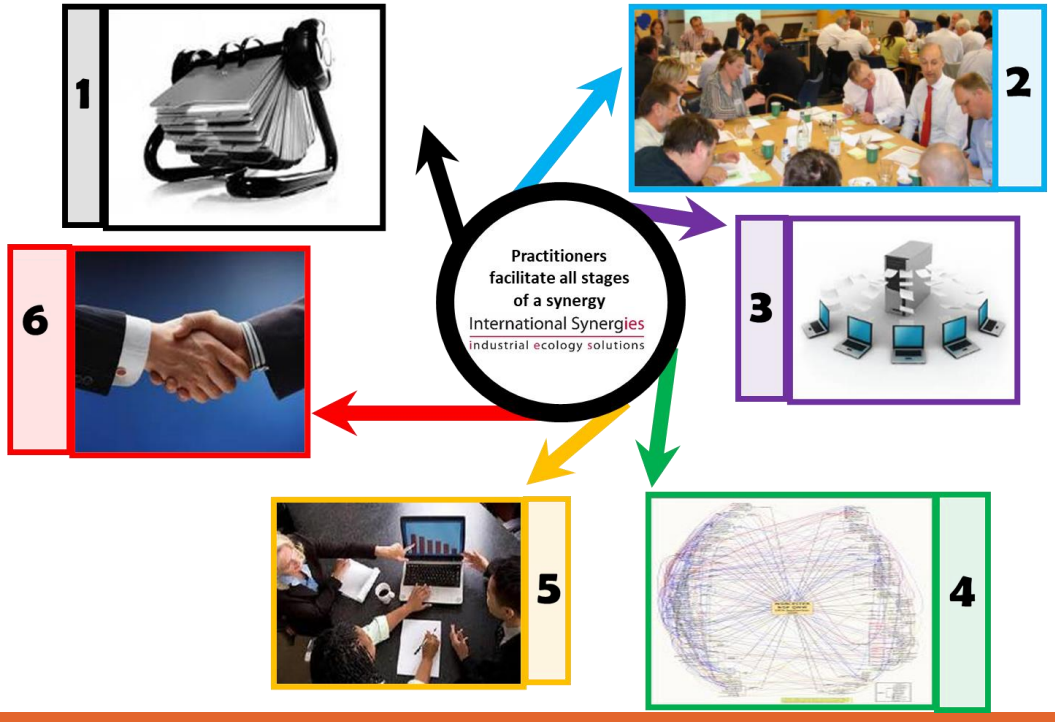
Disposal

The higher the level, **the greater the cost saving**

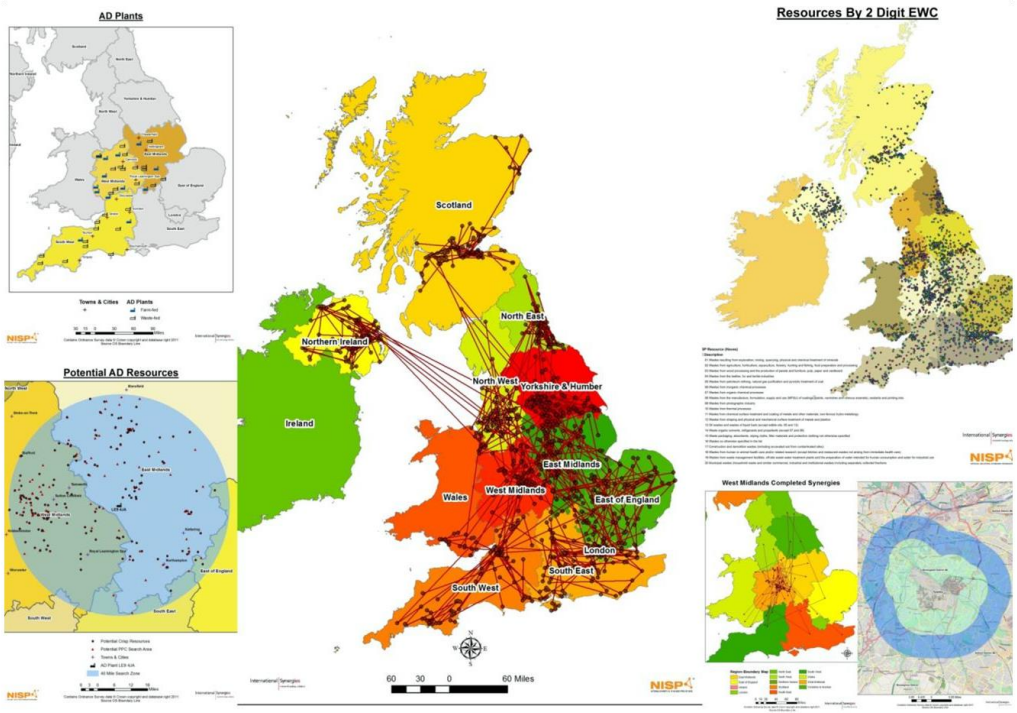
1.4 Self delivery of IS



1.5 A facilitated programme



1.6 Data allows analysis



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1.7 Benefits from NISP®

Business Engagement

£330million
Private Investment

Economic Benefits

£1billion
Additional Revenue

£1billion
Cost Savings

Environmental Benefits

42million tonnes
CO_2e Reduction

72million tonnes
Industrial Water Saved

47million tonnes
Diverted From Landfill

60million tonnes
Virgin Resources Saved

Social Benefits

+ 10,000
Jobs Created Or Safeguarded

1.8 Success factors

Practitioners

- Industrial expertise
- Long term relationship building & facilitation
- Marrying data & expert knowledge
- Working with the regulator and technology providers to ‘enable’ IS activity

Engagement Model

- Extensive, diverse network
- Business opportunity programme
- History of exemplary performance
- Demand pull on innovation

Data

- SYNERGie®4.0, Quality NISP® data & access to regulatory data

Legal Framework & Regulatory Liaison

2. International Examples

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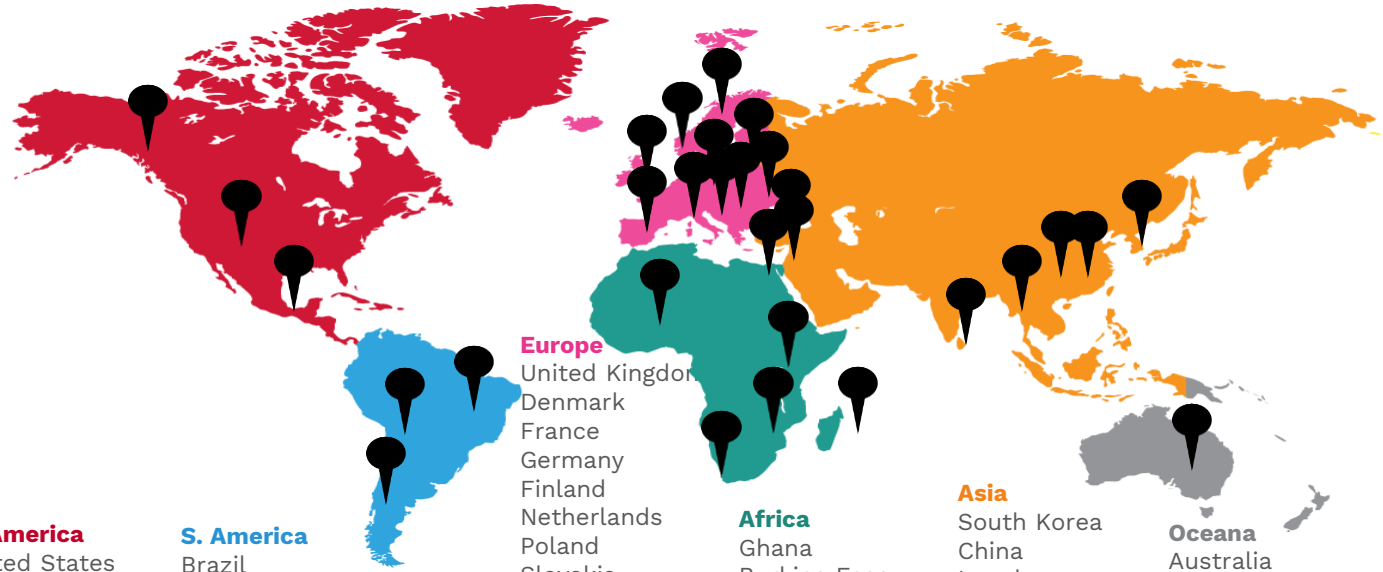
2.1 IS enabling global resource efficiency



N. America
United States
Canada
Mexico

S. America
Brazil
Peru
Chile

Europe
United Kingdom
Denmark
France
Germany
Finland
Netherlands
Poland
Slovakia
Belgium
Romania
Hungary
Italy
Spain

Africa
Ghana
Burkina Faso
Mauritius
Kenya
Uganda
South Africa
Egypt

Asia
South Korea
China
Israel
Sri Lanka
Taiwan
Turkey
Bangladesh

Oceana
Australia

2.2 Progression of European policy

- European **Waste Framework Directive** (2009)*
- Roadmap to **Resource Efficient** Europe – exemplar (2011)*
- DG Regions: Connecting **Smart and Sustainable Growth** through Smart Specialisation – exemplar (2012)*
- DG Enterprise: Communique on Green **Entrepreneurship** (2013)
- European Resource Efficiency Platform – **short-term recommendation** (2014)
- DG **Innovation & Research**: Short guide to assessing environmental impacts of research and innovation policy (2014)*
- **Circular Economy** Package (2015)
- European **Environment Agency**, Circular economy in Europe (2016)*
- DG Energy **Strategic Energy Technology** Plan (2018)
- And finally in 2018 …

2.3 Progression of European policy

- "Waste management in the [EU] should be improved and transformed into **sustainable material management** … **promoting the principles of the circular economy** … in a way that preserves resources and **closes loops**"

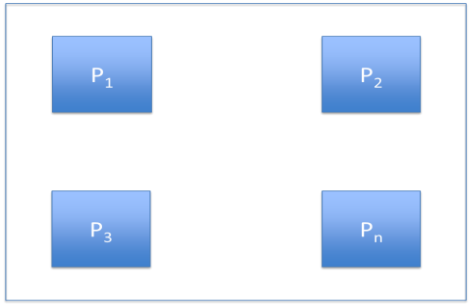
- "… the Commission should be empowered to adopt implementing acts in order to establish detailed criteria … **prioritising replicable practices of industrial symbiosis**."

- *Official Journal of the EU L150 Vol 61*

2.4 DG Grow report (2018)

- **Cooperation Fostering Industrial Symbiosis**
- TNO, Technopolis, Trinomics, International Synergies, UCL
- **€73 billion** estimated across EU on cost reduction alone
- Public sector supported **facilitated industrial symbiosis is best model** to address market failures
- **No evidence of operative fully commercial facilitation** (of industrial symbiosis) in Europe
- Success of industrial symbiosis initiatives is largely dependent on the **policy environment**

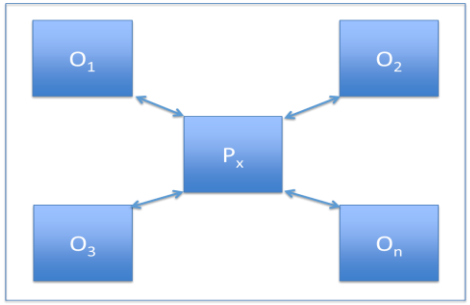
2.5 Different delivery models



P = IS Programme

China 2007,
2010, 2013
Brazil 2010
Poland 2012

Independent

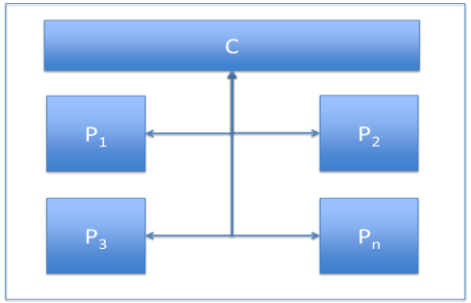


P = IS Programme
O = Organisation

Romania 2009

Belgium 2013

Collaboration



P = IS Programme
C = Coordinator

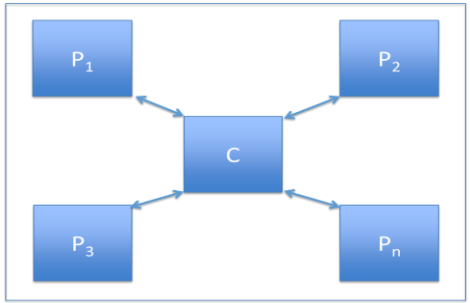
Mexico 2008

Hungary 2010
Turkey 2011

Italy 2013

Netherlands 2013

Single delivery body



P = IS Programme
C = Coordinator

Early NISP 2005

Central co-ordination body

3. International Case Studies

3.1 Potential for aggregation

- Problem: 20 wood producers
  Main wastes: Sawdust / Wood chips / Boards from trunk trimming

- Solution: Wastes collected as each site cleared
  Changed economics to make collection from multi sites viable
  Used to produce Medium Density Fibreboard

- Result:

Total resources– 446 100 tonnes
  Virgin forest saved – 2,558 Hectares

3.2 New policies create new opportunities

- Problem: A new policy in China banning the disposal of sewage sludge to landfill
- Solution: A professional sludge treatment company, whose core technology is extracting protein from sludge for the manufacturing of protein products
- Results:

- Cost reduction:464 000 Yuan per year
- Reduction in CO_2: 1.533 T
- Additional sales: 70,000 Yuan per year
- Reduction in landfill: 180 T per year
- Reduction in virgin material use: 180 T per year

3.3 innovation in materials

- Problem: Hazardous dust from production of air conditioning units needed an alternative solution to landfill

- Solution: The dust was reprocessed and used by Mil-Ver metals in their manufacturing process

- Results:

- Reduction in costs: 45,000 € per year
- Hazardous waste eliminated: 15 tonnes per year
- Reduction in CO_2: 242 tonnes per year

3.4 Use what is available

Sewage sludge - dried by solar and air in large warehouses - solids between 80-95%

High calorific value - used as coal replacement

Overall net carbon saving
7,000 tonnes sewage sludge per year
Net CO2 saving 9,500 tonnes per year

SPIRE-06-2015
Grant Agreement no. **680843**

3.5 Investment/process opportunities

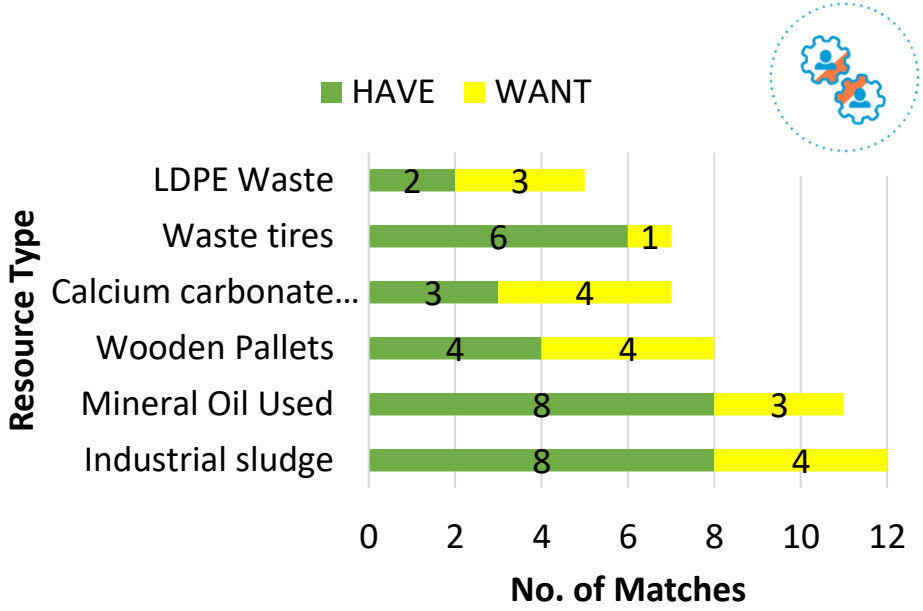
- Initially, no treatment, discharged to sewer - problems at receiving sewage treatment works
- Identified partner for use of material
- Invested in separation and washing facilities
- Now used in animal feed

SPIRE-06-2015
Grant Agreement no. **680843**

4. Stats on IS Matches in the Zone from 2018

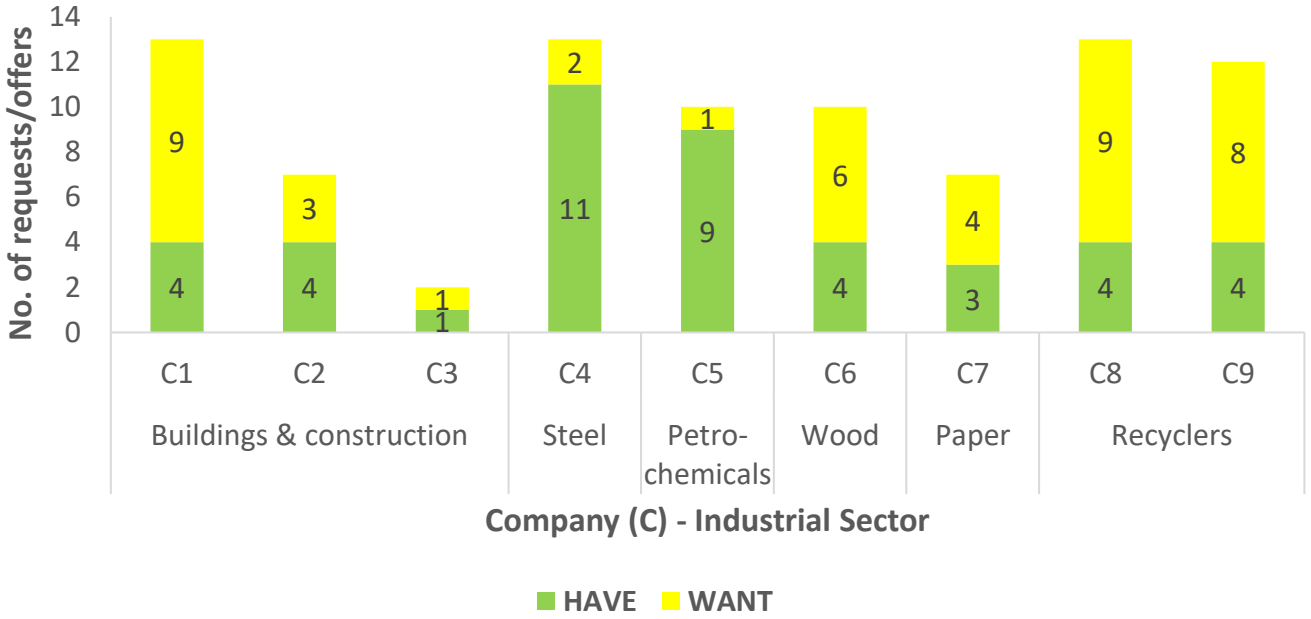
4.1 IS Matches Sample in the Zone (2018)

- An example for successful alternative for industrial waste
- Increased added value and profitability through buying and selling waste



4.1 IS Matches Sample in the Zone (2018)

- A real example for IS in action
- Imagine how many potential deals per each company and sector!



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4.2 IS Matches – General Waste

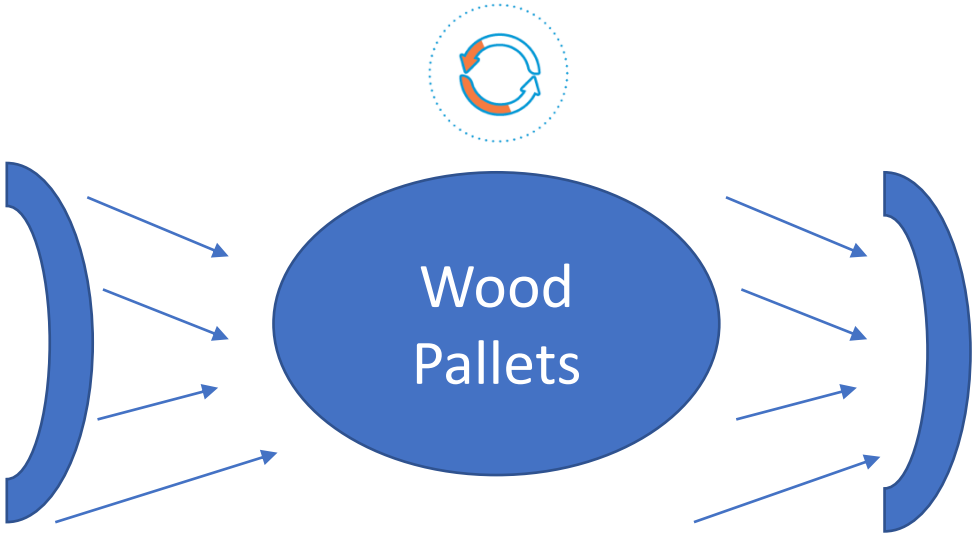
Sectors Have

Construction & building

Engineering

Plastics

Chemicals



Sectors Want

Recyclers

Wood

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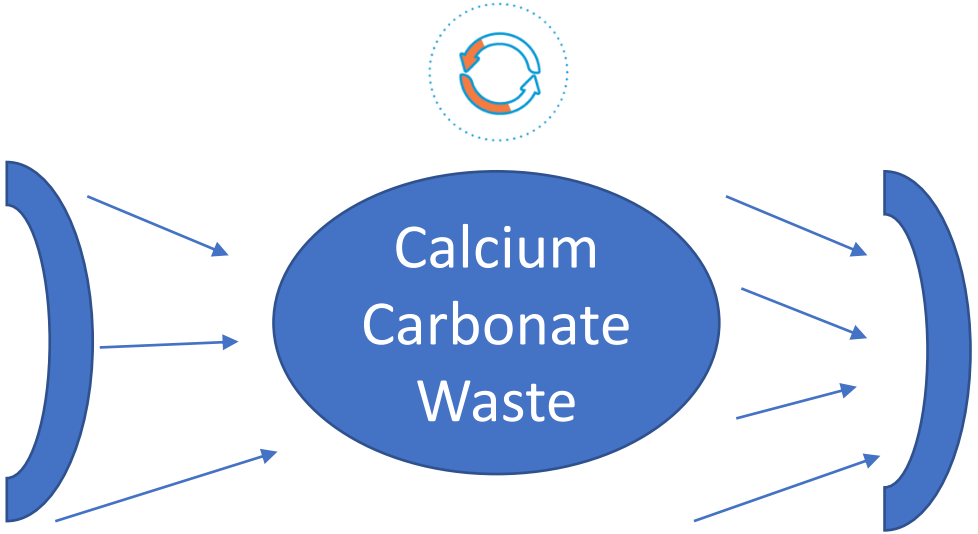
4.3 IS Matches – Specific Waste

Sectors Have

Construction & building

Textile

Fertilizers



Sectors Want

Recyclers

Construction & building

Chemicals

Glass

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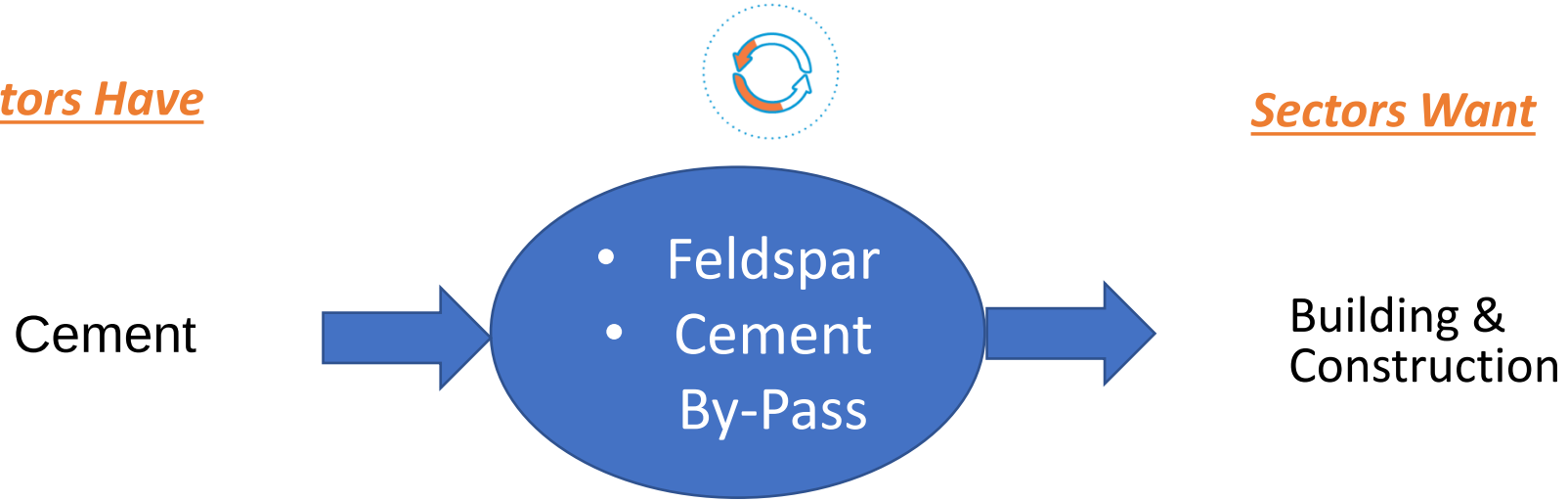
4.4 IS Successful Deals – Specific Waste

Sectors Have

Sectors Want



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4.5 IS Successful Deals – Specific Waste

Sectors Have

Sectors Want

Food

Recycler

5. Egyptian Sample IS Case Studies

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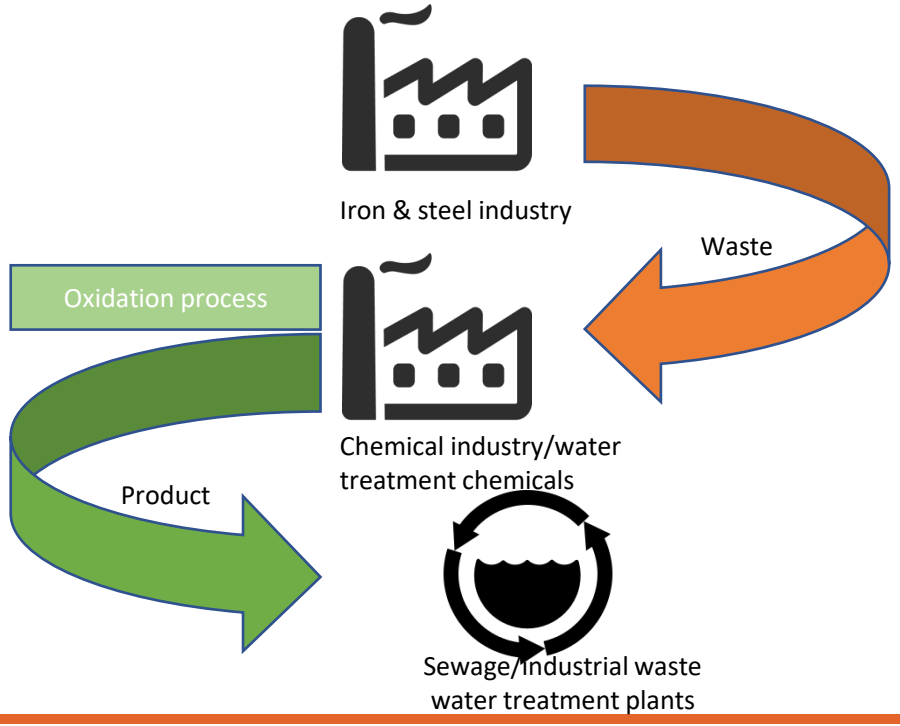
5.1 Spent Acid from Engineering Sector to Sewage Water Treatment



Ferrous Chloride – spent acid

Ferric Chloride – precipitating agent

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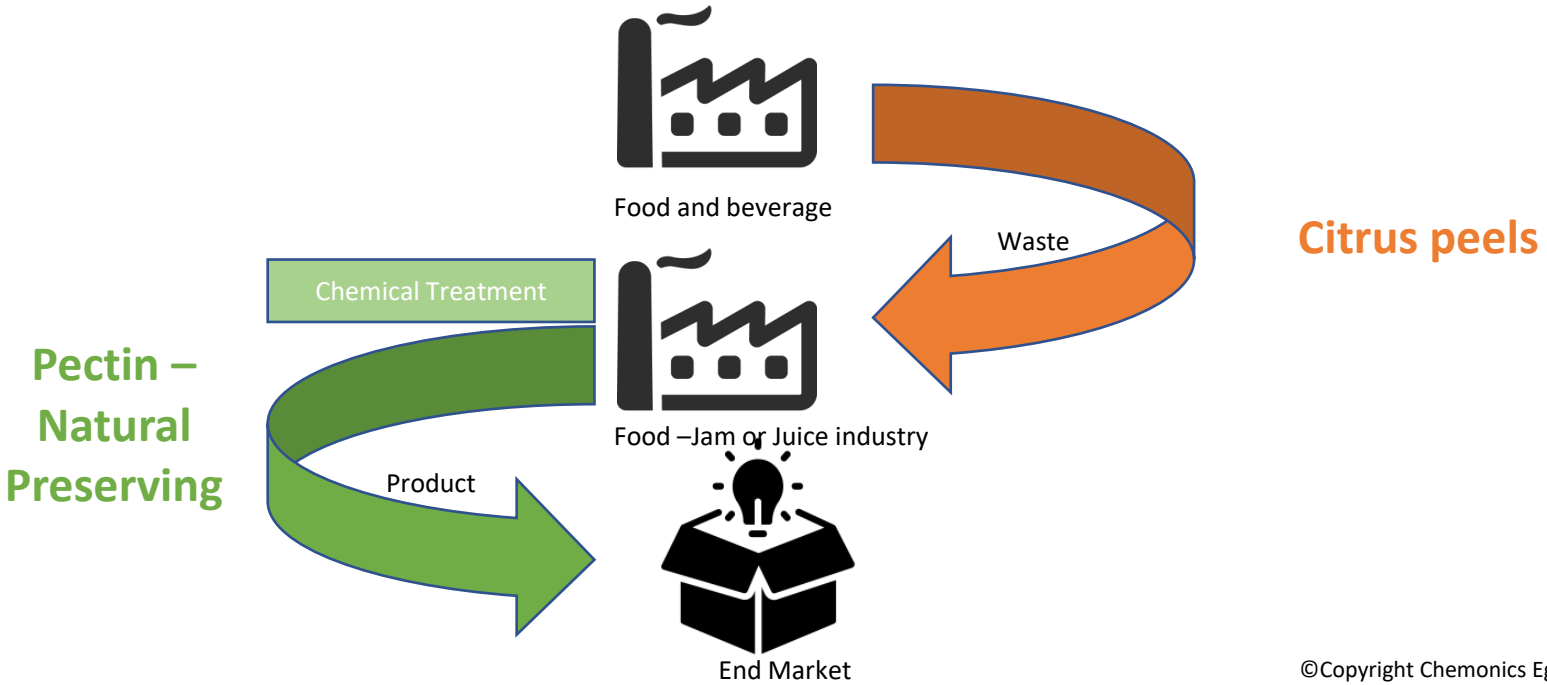
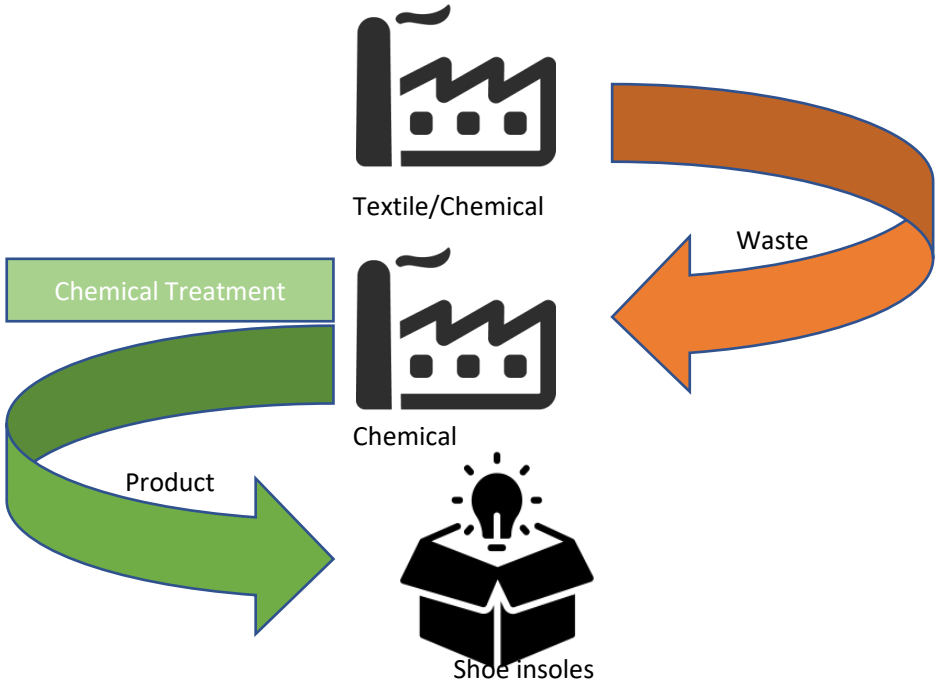
5.3 Citrus Peels From Food Sector to Another Product to Food Sector



5.4 SBR From Textile/Chemical Sector to Chemical Sector



Raw Material for Shoe Insoles

SBR "Styrene Butadiene Rubber"

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5.5 General IS Successful Case

SBR polymer waste

ماك
mac

Polyster Fibers

تدوير
Tadweer

PET waste

Nestlé

BARAMKI
Egyptian Industrial for Chemicals Co.

Shoe Components
Neolite - Eva - Soles
Click to show more»

Building & Road Accessories
Rubber Tiles - Mats - Accessories
Click to show more »

6. Quick Interactive Session

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6.1 Short Interactive Symbiosis Session

Please scan and select what you HAVE/WANT

Q&A

Thank You

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