

***Developing South Africa's biomanufacturing industry through a hub for open innovation: Experiences from the Biomanufacturing Industry Development Centre***

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CSIR research and development strategy manager***

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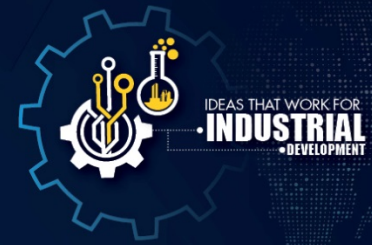
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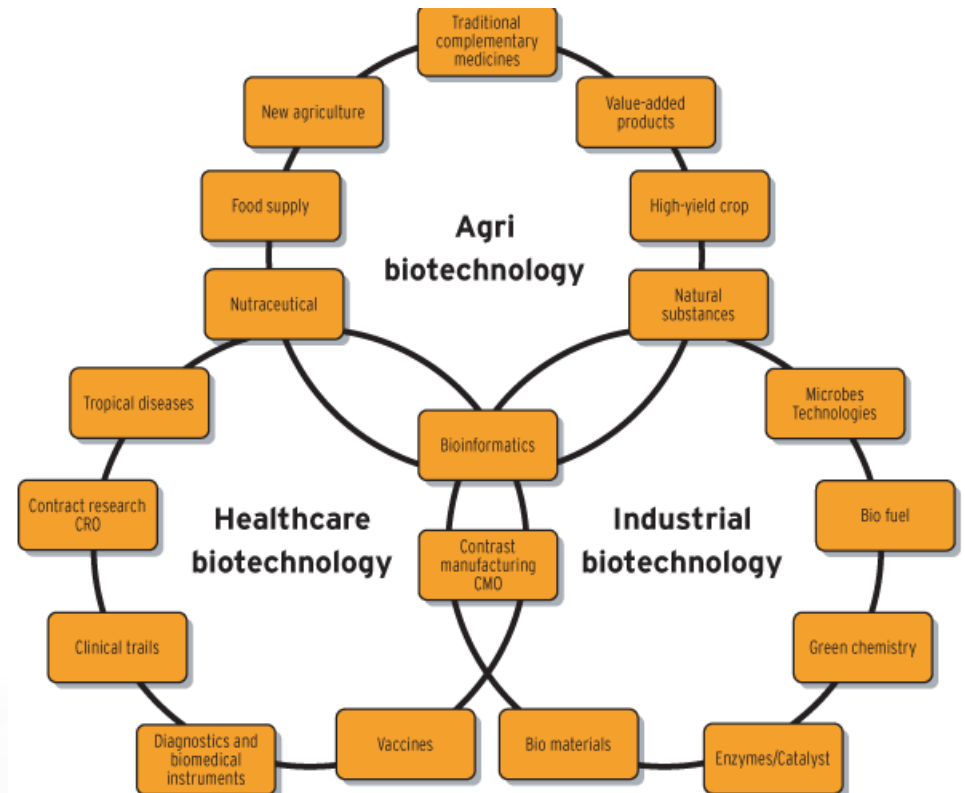
**BIDC**  
BIOMANUFACTURING  
INDUSTRY  
DEVELOPMENT  
CENTRE



# Why biomanufacturing?



- **Industrial biotechnology** is the application of biotechnology for industrial purposes, including manufacturing, alternative energy (or "bioenergy"), and biomaterials.
- Also known as white biotechnology (green = agricultural biotechnology, red = health biotechnology)
- Chemicals
  - Amino acids, vitamins, organic acids and solvents
- Polymers
  - Acrylamide
- Enzymes
  - Biocatalysis, food processing, detergents, paper and pulp
- Bio-energy
  - Ethanol, biodiesel
- Renewable feedstocks
  - Corn, sugar, cellulose
- Performance chemicals
  - Biopolymers, bio-molecules



# Why biomanufacturing?



## BioRenewables

- Become more competitive
- Reduce CO<sub>2</sub> emissions
- Conserve fossil resources



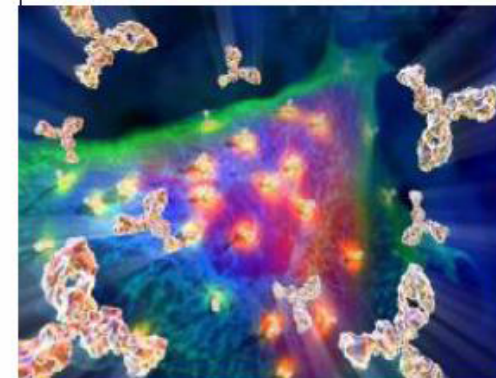
## BioProcesses / BioConversions

- More selective processes improve economy and ecological impact
- Processes simplified by integrating several stages

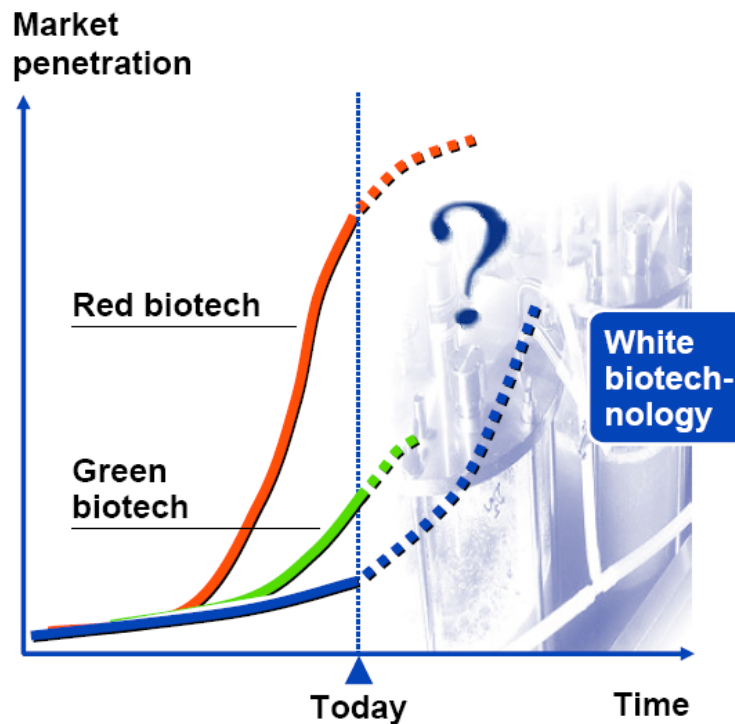


## BioProducts

- Biopolymers
- Biopharmaceuticals
- Enzymes, e.g. for detergents
- Biofuels



# Industrial biotech – the next S-curve in biotechnology



## Industrial applications today

### Bio-feedstock

- Replacement of oil and gas with biomass



### Bio-processes

- Replacement of chemical synthesis by fermentation or biocatalysis

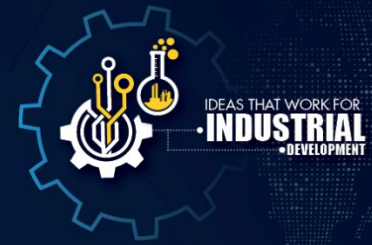


### Bio-products

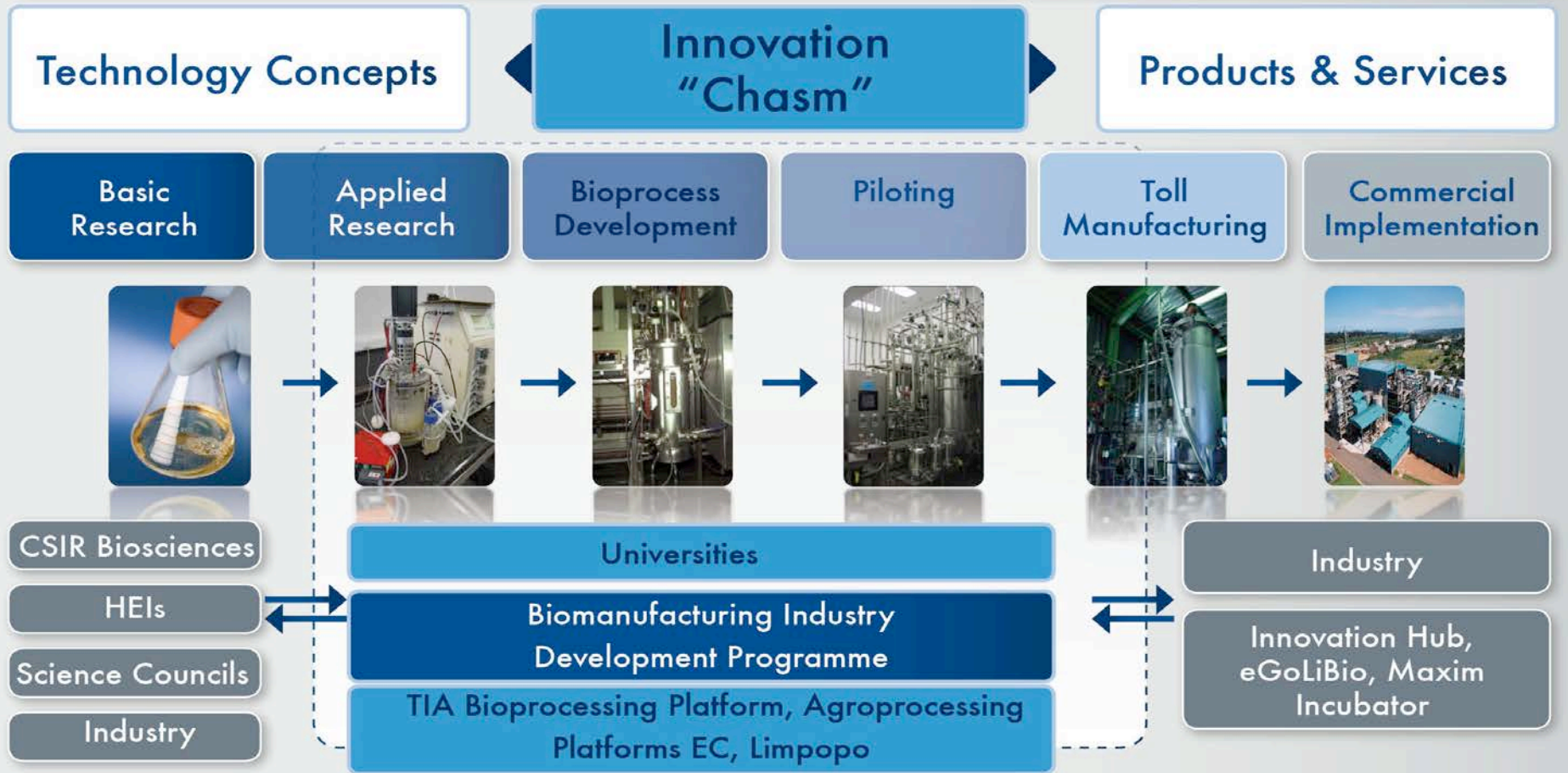
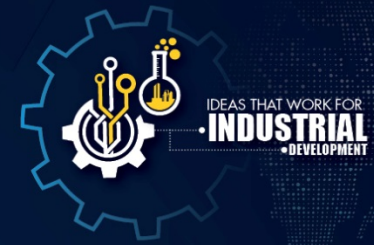
- Products with new characteristics (e.g., biopolymers, enzymes, nutrition/health ingredients)



# SA biomanufacturing sector



# Strategic context: Addressing the innovation chasm



# BIDC programme objectives



## Key objectives:

- To stimulate the growth of a biomanufacturing-based economy by industrialising bio-based R&D
- To strengthen specialist bioprocess and product development competences, including infrastructure
- To provide affordable and readily accessible support to entrepreneurs, SMEs and existing industry in the biomanufacturing sector to penetrate and grow their target markets
- To support skills development and vocational training to prepare resources for the industrialisation of biomanufacturing





# Infrastructure, skills and training



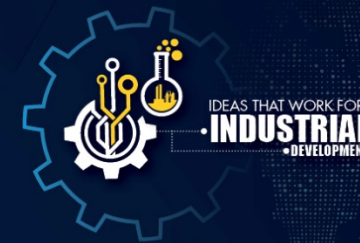
# BIDC track record



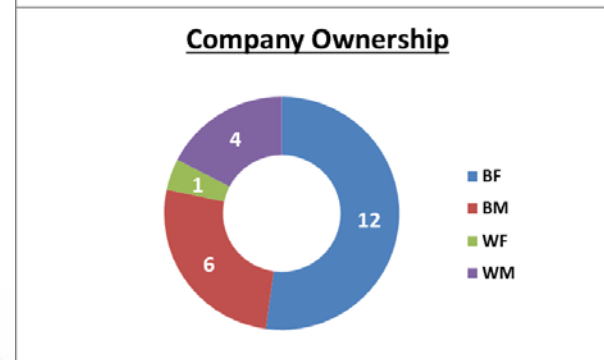
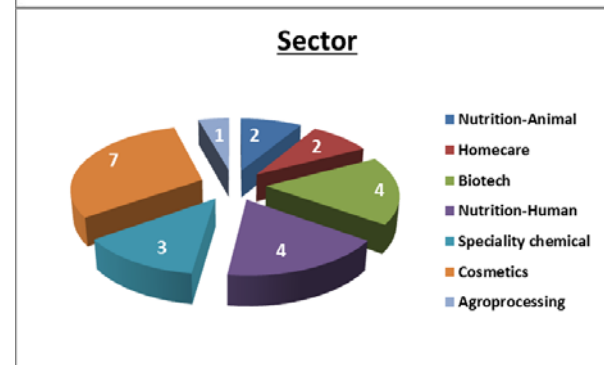
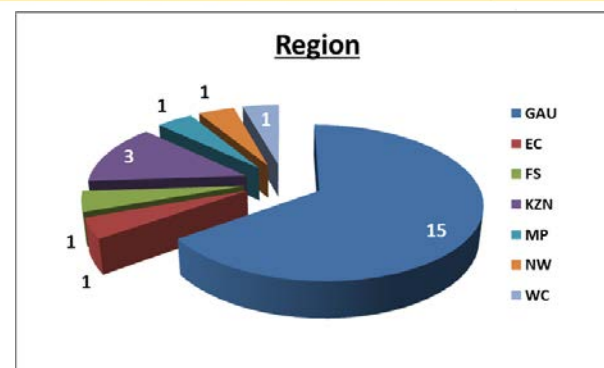
- 20 permanent staff (high-level bioprocessing and engineering skills)
- 22 enterprises supported
- 72 interns trained, majority placed with industry or studying further
- 181 new permanent jobs created in enterprises
- 201 temporary jobs created
- 75 new products transferred to enterprises
- 2 spin out companies



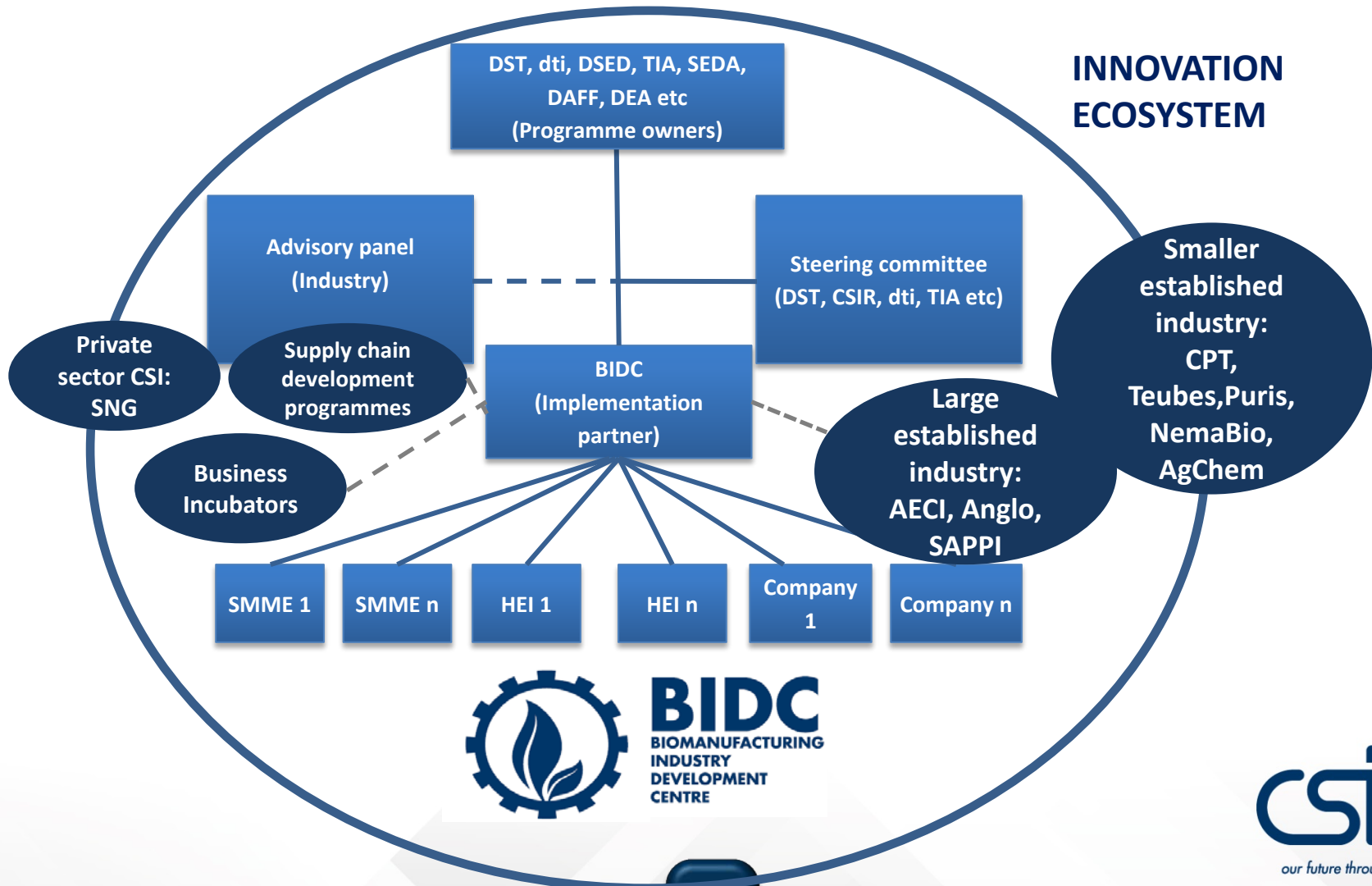
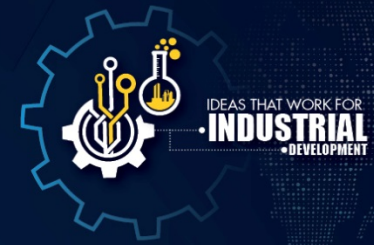
# BIDC track record



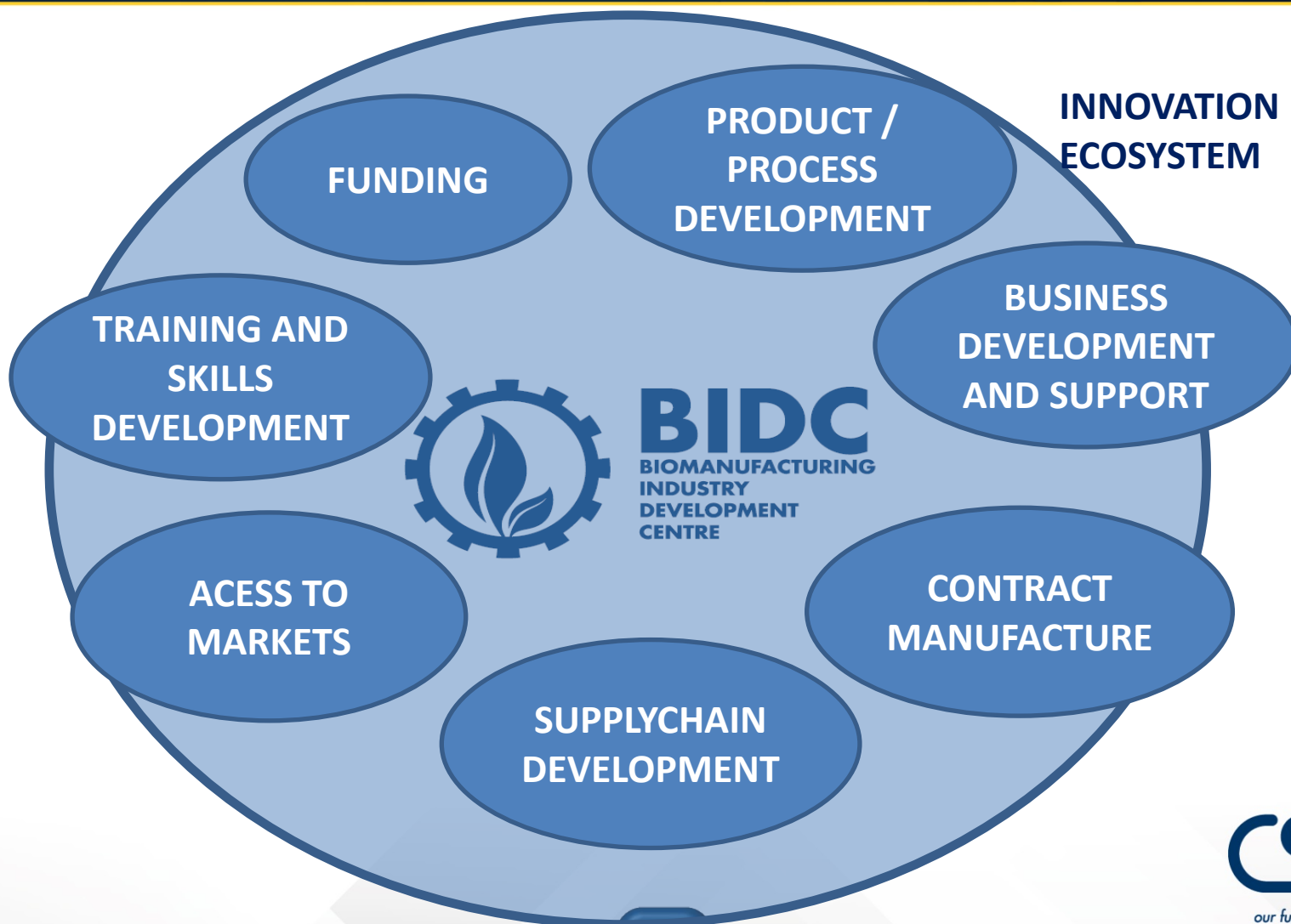
ENTERPRISE NAME	SECTOR	Product
ResynBio	Biotech	Resyn microbeads
Optimus	Biotech	Industrial biologics
JVS Biotech	Biotech	Laboratory reagent
Amimo Investment Holdings	Cosmetics	Cosmetics
K Squared Group	Cosmetics	Hair care
Mamoa Trading Enterprise	Cosmetics	Cosmetics
Marple Skin Care	Cosmetics	Cosmetics
Yivani	Cosmetics	Cosmetics
Ardhi Concepts	Cosmetics	Cosmetics
Phepisa	Cosmetics	Cosmetics
Ubitron	Homecare	Mosquito repellent candles
Linda	Homecare	Imphepo incense sticks
Bio-one	Nutrition-Animal	Plant based protein
Khepri Innovations	Nutrition-Animal	Fly larvae fractions
Golden Goose	Nutrition-Human	Traditional beverage
Elvema Nutrition	Nutrition-Human	Moringa fortified foods
Sliek	Nutrition-Human	Lactose free products
ConnectMe	Speciality chemical	Biopolymer
Abxtracts	Speciality chemical	Hydroxytyrosol
Biomoringa	Agroprocessing	Processed moringa leaves/seeds
Lighthouse	Biotech	Probiotics
Grapeseed	Nutrition-Human	Traditional beverage
Origen	Speciality chemical	Cane wax



# BIDC programme design

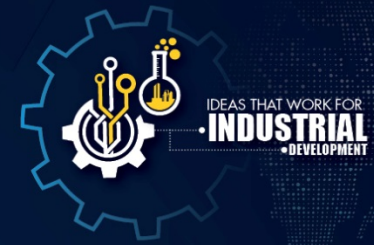


# BIDC programme – what we offer to industry



# Enterprise examples

# Case study: Elvema



- Makekele Somo-Tladi
- Fortified food products
- Transferred 5 products:



Elvema Nutritions (Pty) Ltd

*Elvema Products*

Vanilla Adult instant porridge moringa fortified
Vanilla Advanced instant porridge moringa fortified
Vanilla Kids instant porridge moringa fortified
Moringa teabags
Moringa powershake

- Exporting into Southern Africa (Zimbabwe and Namibia):700 tonnes
- Manufacturing facility was set up
- Products in selected Spar's in SA
- 14 new permanent jobs created



# Case study: OptimusBio



- Green cleaning and environmental solutions
- Transferred 21 new products developed jointly with entrepreneur
- Knock on enterprise support - BioCentric, Agchem, Earth Probiotic, Procon
- Significant job creation in the value chain (13)
- Company premises (CSIR campus) where formulation, filling and labelling of products will be done

OPTIMUSBIO  
GREENER TOGETHER



OPTIMUSBIO  
GREENER TOGETHER

our future through science

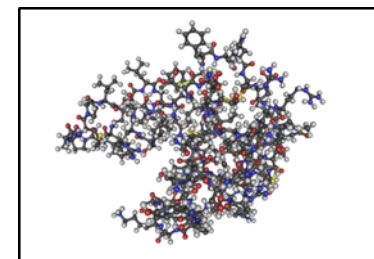


# Case study: JVS Biotech

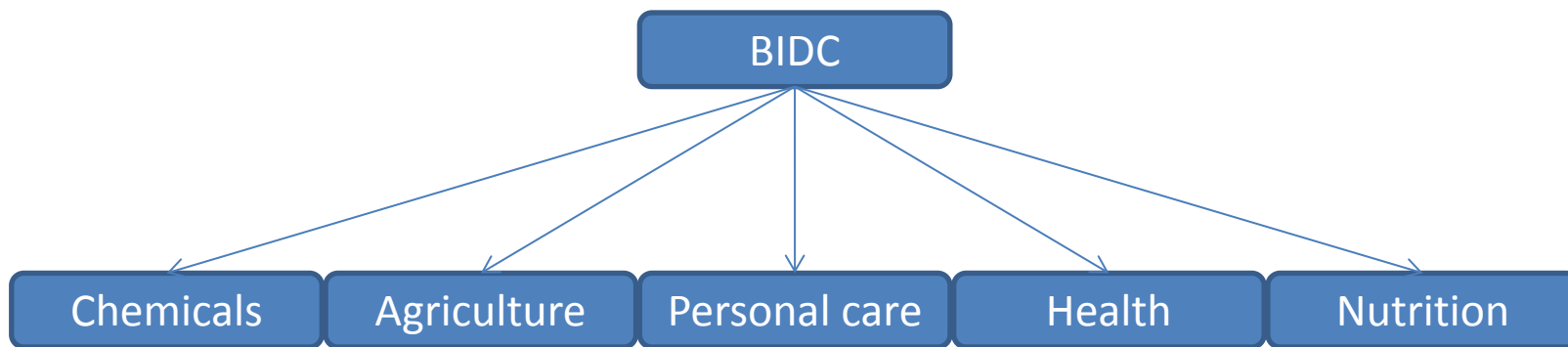


- JVS obtained licensed IgF technology
- Required validation and scale up
- BIDC validate, made process improvements, manufactured IgF market samples the quality of which exceeds gold standard
- Currently contract manufacturing for JVS
- Order volumes increasing

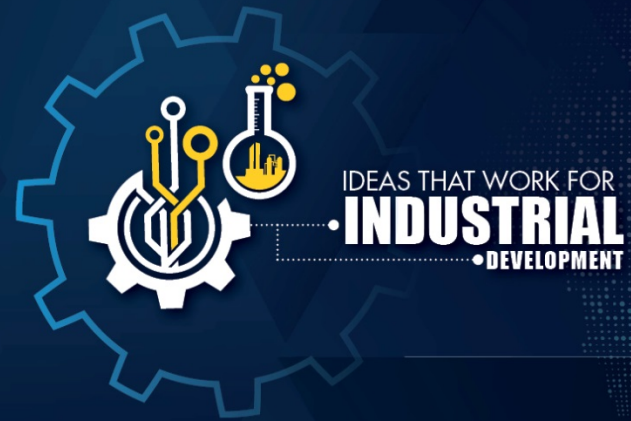
JVS  
Biotech



# How can BIDC help industry



Skills	Biochemists, microbiologists, chemical and bioprocess engineers, chemists, analytical specialists
Infrastructure	Pilot scale (up to 1000L) infrastructure for chemical, biochemical and agroprocessing operations
Capabilities	Bespoke biological manufacturing platforms across all microbial classes (yeast, bacteria, algae), biocatalysis, chemical synthesis, downstream processing, formulation, packaging, natural product extractions, agroprocessing
Other	Quality control specifications, design engineering, business support, regulatory support (dossier generation), market access and linkages



**Thank you**

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